Introduction to dynamical systems and ergodic theory

François Berteloot- `francois.berteloot@math.univ-toulouse.fr`

Abstract:

These lectures aim to provide an introduction to the general ergodic theory of dynamical systems. We will also illustrate the main concepts on the special case of polynomial dynamical systems. We will in particular cover the following topics.

1. Invariant measures. Ergodicity. Mixing.

2. Birkhoff ergodic theorem.

3. Lyapunov exponents.

4. Multiplicative ergodic theorem.

5. Applications to the study of the Mandelbrot set.

Prerequisites:

Elementary topology, Functional analysis, Measure theory.

References:

1. Y. Coudène, *Théorie ergodique et systèmes dynamiques.* EDP-Sciences, 2013.

2. A. Katok - B. Hasselblatt, *Introduction to the modern theory of dynamical sytems* Cambridge University Press, 1995.

3. M. Viana, *Lectures on Lyapunov exponents* Cambridge studies on advanced mathematics, 2015.

4. F. Berteloot, *Bifurcation currents in holomorphic families of rational maps* Springer LNM, 2013.