DYNAMICS OF TRANSCENDENTAL HENON MAPS

ANNA MIRIAM BENINI, UNIVERSITAT DE BARCELONA

In this course we cover the dynamics of transcendental Henon maps. A transcendental Henon map is an automorphisms of $\mathbb{C}^2$ of the form $F(z,w) = (f(z) + aw, z)$ with $f : \mathbb{C} \to \mathbb{C}$ entire transcendental and $a \in \mathbb{R}$.

- Lecture 1. (IMUB, September 19, 9h-11h).
  Different definitions of normality for holomorphic functions in $\mathbb{C}^2$. Basic features of holomorphic dynamics in $\mathbb{C}^2$. Existence of saddle points for transcendental Henon maps. Proof of the non-emptyness of the Julia set.

- Lecture 2. (IMUB, September 20, 9h-11h).
  Classification of recurrent Fatou components. We show that for any invariant recurrent Fatou component Ω there is a retraction $\rho : \Omega \to \Sigma \subset \Omega$ where Σ is an invariant limit manifold of rank 0, 1 or 2. If Σ has rank 0, Ω is an attracting domain; If Σ has rank 2, Ω is a rotation domain; if Σ has rank 1, then it is a rotational surface.

- Lecture 3. (IMUB, October 11, 9h-11h).
  Baker domains and subharmonic trick. We construct a transcendental Henon map F with an invariant Baker domain on which F is conjugate to a translation. This example is highly inspired by the construction of Baker domains in one-dimensional holomorphic dynamics.

- Lecture 4. (IMUB, November 22, 9h-11h).
  Escaping and Oscillating Wandering domains. We construct an example of a transcendental Henon map with a wandering domain whose orbits converge to infinity, and of a transcendental Henon map with n oscillating orbit of wandering domains.The first example is inspired by the construction of wandering domains in one variable while the second example is costructed using Runge approximation.