

Towards a global view of dynamical systems, for the C^1 -topology

Christian Bonatti

CNRS & Université de Bourgogne, France

bonatti@u-bourgogne.fr

In the early sixties, Smale proposed the hyperbolicity as a general description of dynamical systems, but he quickly discovered that hyperbolicity does not propose a general view of dynamical systems: There are systems which are not approached (in any C^r -topology, $r \geq 1$) by hyperbolic systems.

Many perturbation lemmas in the C^1 -topology have allowed to extract fundamental mechanisms generating C^1 -robustly non-hyperbolic dynamics, and some global view seems to appear from the numerous results obtained in the last decade. In particular, Jacob Palis [1] proposed several ambitious conjectures for a general description, and the paper [2] recently proposed a more precise general view based on a decomposition of the space of dynamical systems under dichotomies *local (robust) phenomena* versus *global (robust) geometric structures*.

I will try to present this global view in an accessible way.

References

- [1] *J. Palis*: A global view of dynamics and a conjecture on the denseness and finitude of attractors. *Astérisque* 261 (2000), 335–347.
- [2] *C. Bonatti*: Survey: Towards a global view of dynamical systems, for the C^1 -topology. *Ergodic Theory Dynam. Systems* 31 (2011), 959–993.