On finite-dimensional attractors of homeomorphisms (joint with Jaime Sánchez-Gabites)

James Robinson

Abstract

Let E be a linear space and suppose that A is the global attractor of either (i) a homeomorphism $F : E \to E$ or (ii) a semigroup $S(\cdot)$ on E that is injective on A. In both cases A has trivial shape, and the dynamics on A can be described by a homeomorphism $F : A \to A$ (in the second case we set $F = S(t)$ for some $t > 0$). If the topological dimension of A is finite we show that for any $\epsilon > 0$ there is an embedding $e : A \to \mathbb{R}^k$, with $k \sim \dim(A)$, and a (dynamical) homeomorphism $f : \mathbb{R}^k \to \mathbb{R}^k$ such that F is conjugate to f on A (i.e. $F|_A = e^{-1} \circ f \circ e$) and f has an attractor A_f with $e(A) \subset A_f \subset N(e(A), \epsilon)$. In other words, we show that the dynamics on $\mathring{A}$ is essentially finite-dimensional.