Solenoid attractors in 4-manifolds

Jiangang Yao
University of California at Berkeley, USA

Abstract. (This is a joint work with Fan Ding and Shicheng Wang.) Morse theory provides a way to get the topological information of manifold by the critical points of a function. Now there is a question in the similar spirit: for a diffeomorphism of a manifold, given the information about its non-wondering set (generalization of periodic points), what can we say about the manifold? Solenoid, which is the nested intersection of solid tori, is a typical type of non-wondering sets. We show that no 4-manifold admits a diffeomorphism whose non-wondering set consists of only solenoids. While in the 3-dimensional case, B. Jiang, Y. Ni and S. Wang showed it could be lens spaces. This problem is also related to Anosov diffeomorphisms and expanding maps in dynamical systems.