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## **When Topology forces Dynamics**

We study situations in which topological considerations such as the action on homology or the fundamental group reveal a great deal about the dynamics of a system. From another point of view, this is the study of dynamics which are preserved by large perturbations in the same homotopy class. Often such theorems start with a model system with well-understood but complicated dynamics and then it is shown that most or all its dynamics are preserved under homotopy. In this some form of hyperbolicity at some scale is essential. Topics will include: The fixed point index, Lefschetz formula, Nielsen Theory, Franks and Handel homotopy stability theorems, pseudoAnosov maps, and applications to the partial order on braid types, rotation sets and fluid mixing.