(Anti-)classification results in Dynamical Systems and Ergodic Theory

A fundamental theme in dynamics is the classification of systems up to appropriate equivalence relations. For instance, the equivalence relation of *topological conjugacy* preserves the qualitative behavior of topological dynamical systems. Smale's celebrated program proposes to classify topological or smooth dynamical systems up to topological conjugacy. In Ergodic Theory the *isomorphism problem* dates back to von Neumann's foundational paper and asks to classify measure-preserving transformations up to measure isomorphism.

These classification problems not only turn out to be hard but sometimes even to be impossible. In this talk, we give an overview of classification as well as anti-classification results. We present some related projects emphasizing contributions of the Anosov-Katok method in this area.