

Umberto Hryniewicz (RWTH-Aachen): Reeb flows in dimension three with exactly two periodic orbits

Monday, May 17, 2021 3:00 PM (50 minutes)

In this talk I will present a complete characterization of Reeb flows on closed 3-manifolds with precisely two periodic orbits. The main step consists in showing that a contact form with exactly two periodic Reeb orbits is non-degenerate. The proof combines the ECH volume formula with a study of the behavior of the ECH index under non-degenerate perturbations of the contact form. As a consequence, the ambient contact 3-manifold is a standard lens space, the contact form is dynamically convex, the Reeb flow admits a rational disk-like global surface of section and the dynamics are described by a pseudorotation of the 2-disk. Moreover, the periods and rotation numbers of the closed orbits satisfy the same relations as (quotients of) irrational ellipsoids, and in the case of S^3 the transverse knot-type of the periodic orbits is determined. Joint work with Cristofaro-Gardiner, Hutchings and Liu.