Local contact homology and applications

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Abstract:
In this talk we define and compute the local contact homology of Reeb orbits which are isolated in the loop space of a manifold equipped with a contact form. As in Floer theory, this local homology turns out to be a useful tool in the study of global dynamical properties of Reeb flows. We present some applications to existence/multiplicity questions of periodic orbits. For instance, if linearized contact homology of a contact manifold with a strong exact filling is unbounded then the Reeb flow of any contact form defining the contact structure has infinitely many closed orbits. This assumption is satisfied by unit cotangent bundles for which the homology of the loop space of the base is unbounded.
We also describe results on resonance relations and on the existence of non-hyperbolic closed orbits.
This is joint work with Leonardo Macarini.