THU/110
15:30–15:50

Precise asymptotics for periodic orbits of the geodesic flow in nonpositive curvature, asymptotics for volume, and the Margulis construction

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In this talk I formulate and prove a *precise asymptotic formula* for the number of homotopy classes of periodic orbits for the geodesic flow on rank one manifolds of nonpositive curvature. This extends a celebrated result of Fields medalist G. A. Margulis to the nonuniformly hyperbolic case and strengthens previous results by G. Knieper. More precisely, the following theorem is shown:

THEOREM. *(Precise asymptotics for periodic orbits, [1]). Let M be a compact Riemannian manifold of nonpositive curvature and rank one. Then the number P_t of homotopy classes of periodic orbits of length at most t for the geodesic flow is given by the formula*

$$P_t \sim \frac{e^{ht}}{ht}$$

where $\sim$ means that the quotient converges to 1 as $t \to \infty$. Here h is the topological entropy of the geodesic flow.

While proving this result, I also carry out Margulis' construction of the measure of maximal entropy without requiring strong hyperbolicity, and demonstrate the usefulness of this measure. This talk also deals with asymptotics of volume.

[1] R. GUNESCH: *Counting closed geodesics on rank one manifolds. http://arxiv.org/abs/0706.2845.*