

Talk Yu.G. Nikonorov for the Chern Institute of Mathematics, March 18-31, 2019

GEODESIC ORBIT RIEMANNIAN SPACES: NEW RESULTS AND NEW PROBLEMS

This talk is devoted to geodesic orbit Riemannian spaces that could be characterized by the property that any geodesic is an orbit of some one-parameter group of isometries.

We discuss some recent results in this direction. At first, we consider some structural results and relationships between geodesic orbit spaces and Killing vector fields of constant length. Then we discuss important totally geodesic submanifolds that inherit the property to be geodesic orbit, the structure of the nilradical and the radical of the Lie algebra of the isometry group. We also discuss some new tools to study geodesic orbit Riemannian spaces, related to compact Lie group representations with non-trivial principal isotropy algebras.

In the second part of the talk, we discuss some partial classifications of geodesic orbit spaces and some related unsolved problems.