Monday, April 28, 2025
from 4:45 p.m. to 6:20 p.m. (Moscow time)
room 16-10 and ZOOM translation

Ivan N. Mikhailov

Gromov–Hausdorff distances between unbounded metric spaces

The classical Gromov–Hausdorff distance between metric spaces X and Y is defined as the infimum of the Hausdorff distances between the images X' and Y' of X and Y over all isometric embeddings $\phi\colon X \to Z$ and $\psi\colon Y \to Z$ into some metric space Z. This distance was first introduced by David Edwards in 1975 and later became famous due to the work of Mikhail Gromov on groups of polynomial growth.

In the well-known monograph “Metric structures for Riemannian and non-Riemannian surfaces” Mikhail Gromov introduced classes of metric spaces at finite Gromov–Hausdorff distances from each other (later, in the work of S. A. Bogatyy and A. A. Tuzhilin, such classes were called *clouds*). The structure of the cloud of all bounded metric spaces is well known: it is a contractible cone with its vertex in a one-point metric space. However, until recently, almost nothing was known about the geometry of all other clouds defined by unbounded metric spaces.

In the talk, we will recall the basic definitions and classical theorems about the cloud of bounded metric spaces, and also discuss recent results related to the calculation of Gromov–Hausdorff distances between some classes of unbounded metric spaces. Namely, we will discuss Gromov–Hausdorff distances between normed spaces and ε-nets in them, between metric trees and some of their subsets, and as an application we will construct a number of new geodesics lying in the cloud of the real line.

SCIENTIFIC SEMINAR
“DIFFERENTIAL GEOMETRY AND APPLICATIONS”

headed by Academician of RAS Anatoly T. Fomenko

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