Monday, March 2, 2026
from 4:45 p.m. to 6:20 p.m. (Moscow time)
room 16-10 and ZOOM translation

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Continuous Gromov–Hausdorff distance

The famous Gromov–Hausdorff distance measures the degree of non-isometricity of metric spaces: for isometric spaces, the distance is zero, and the more dissimilar the spaces are, the larger this distance is. The Gromov–Hausdorff distance has many important applications, both in fundamental science and in applied fields, for example, in studying the growth rate of discrete groups, in computer graphics and computational geometry, in pattern recognition theory, in robotics, and even in cosmology.

However, the classical definition of the Gromov–Hausdorff distance does not take into account additional structures that metric spaces may possess. Even the topology generated by the metric is ignored by this distance (the best "comparisons" of spaces need not be continuous). There are many different modifications that accommodate various additional structures. For example, when studying quantum metric spaces, the modified distance takes into account the structure of the ordered linear space in which the state space "lives". Another example is the study of distances between dynamical systems, which allows for comparison of solutions to systems of differential equations. Here, continuity must be taken into account. However, in a modern monograph known to us, the modification of the Gromov–Hausdorff distance no longer satisfies the triangle inequality, which significantly complicates the proofs of even the most natural fundamental properties. On the other hand, there is a publication whose authors define a "continuous" distance satisfying the triangle inequality. They show that this distance can differ from the classical one, for example, in the case of standard spheres of different dimensions. However, the paper does not conduct any fundamental research.

In our talk, the latter modification occupies a central place. In our papers, we described the basic properties of this distance and discovered a number of interesting details. For example, this distance is highly sensitive to topological dimension. We will describe this new theory and also give examples of other modifications of the Gromov–Hausdorff distance.

SCIENTIFIC SEMINAR
"DIFFERENTIAL GEOMETRY AND APPLICATIONS"

headed by Academician of RAS Anatoly T. Fomenko

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