Monday, December 8, 2025
from 4:45 p.m. to 6:20 p.m. (Moscow time)
room 16-10 and ZOOM translation

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Projectively Equivalent Metrics, Billiards, and Nijenhuis Geometry

We will discuss connections between two seemingly completely different areas of mathematics: the theory of projectively equivalent metrics and integrable billiards in domains bounded by quadrics.

The first stage is devoted to the classification of geodesically consistent pairs g, L in dimension two. Such pairs prove to be extremely interesting objects. In particular, the level lines of the eigenvalues of the operator L define a family of quadrics with remarkable focal properties (in the Euclidean case, this is precisely an elliptic coordinate system, i.e., a family of confocal quadrics).

Furthermore, such pairs g, L are associated with an integrable system whose additional integral is preserved under the reflection of a material point from a curve of such a family (reflection should be considered in the sense of the corresponding flat metric, i.e., pseudo-Euclidean reflections and Minkowski billiards arise). This allows us to define a large class of billiards, a significant portion of which are new.

SCIENTIFIC SEMINAR
"DIFFERENTIAL GEOMETRY AND APPLICATIONS"

headed by Academician of RAS Anatoly T. Fomenko

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`http://dfgm.math.msu.su/chairsem.php`