November 11, from 4:45 p.m. to 6:20 p.m. (Moscow time)
room 16-10 and broadcast via ZOOM

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Liouville foliation of planar billiards in magnetic and potential field. Part 2

In the last few years, the theory of integrable billiards has been greatly developed in many directions, including the study of their Liouville foliations. So, starting from the works of V. Dragović and M. Radnović on the study of elliptic billiard, V. V. Vedyushkina extended their results to an arbitrary elliptic-hyperbolic table, and then introduced the concept of a billiard book. This gives a significant extension of the class of billiard systems. Consequently, A. T. Fomenko proposed the hypothesis saying that any integrable system with two degrees of freedom is Liouville-equivalent to some billiard book. A weaker version of this hypothesis (on the realization of any base of foliation) was constructively proved by V. V. Vedyushkina and I. S. Kharcheva. Nevertheless, the construction is not sufficient to prove the stronger version of the hypothesis. It inspires us to generalize the concept of a billiard even further, by adding, for example, a potential or magnetic field.

In my last talk, integrable billiards with a potential were considered. Namely, we discussed the restrictions imposed by integrability, computed the isoenergetic Fomenko-Zieschang invariants, and constructed bifurcation diagrams. The present talk is devoted to magnetic topological billiards. Similarly to the case of potentials, we will identify the restrictions given by integrability, construct bifurcation diagrams and propose an algorithm which constructs the Fomenko-Zieschang invariants based on the topological billiard shape.

SCIENTIFIC SEMINAR
"DIFFERENTIAL GEOMETRY AND APPLICATIONS"

headed by Academician of RAS Anatoly T. Fomenko

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