



THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Seminar in Geometry and Topology

Room 290C ,Ziskind Building
on Tuesday, Jun 07, 2016
at 16:00

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On periodic orbits in complex planar billiards

Abstract:

A conjecture of Victor Ivrii (1980) says that in every billiard with smooth boundary the set of periodic orbits has measure zero. This conjecture is closely related to spectral theory. Its particular case for triangular orbits was proved by M. Rychlik (1989, in two dimensions), Ya. Vorobets (1994, in any dimension) and other mathematicians. The case of quadrilateral orbits in dimension two was treated in our joint work with Yu. Kudryashov (2012). We study the complexified version of planar Ivrii's conjecture with reflections from a collection of planar holomorphic curves. We present the classification of complex counterexamples with four reflections and partial positive results. The recent one says that a billiard on one irreducible complex algebraic curve without too complicated singularities cannot have a two-dimensional family of periodic orbits of any period. The above complex results have applications to other problems on real billiards: Tabachnikov's commuting billiard problem and Plakhov's invisibility conjecture.