On local Birkhoff conjecture for convex billiards

Vadim Kaloshin

University of Maryland, College Park, MD, USA

vadim.kaloshin@gmail.com

The classical Birkhoff conjecture states that the only integrable billiard is the billiard inside an ellipse. We show that this conjecture is true for small perturbations of ellipses preserving many rational caustics. This consists of two main steps: study small perturbations of the circle (joint with A. Avila and J. De Simoi) and extend the analysis to small perturbation of ellipses (joint with A. Sorrentino). In a somewhat different direction we prove the conjecture that for small perturbation of the circle preserving not so many rational caustics (joint w G. Huang and A. Sorrentino).