Corentin FIEROBE

Projective billiards with open sets of periodic orbits

Billiard theory is a beautiful field of research providing funny examples of discrete dynamical systems, which can unexpectedly appear in certain problems. They can be studied using many various approaches, from complex systems to Teichmüller theory. More precisely, a classical billiard is a bounded domain inside of which evolves an infinitesimally small particle and which is reflected by the boundary following the usual law of reflection (angle of incidence = angle of reflection). Its behaviour depends on the shape of the domain (polygonal, convex, or with different connected components...).
In this talk, I will present another model of billiard, called projective billiard, which generalizes the usual billiard in a Euclidean space or a surface of constant curvature. It is the data of a domain and a field of transverse lines on its boundary, from which one can define a new law of reflection for particles evolving inside the domain and bouncing on the boundary. They exhibit some spectacular properties about periodic orbits which I intend to describe.