REMI JAOUI, University of Waterloo

Geodesic flows and model theory of differential fields

Geodesy is an old and well-established subject in mathematics. Given a smooth manifold S embedded in the Euclidean space and two points on S, the main question is to determine the shortest path (geodesic) drawn on S joining these two points.

It is well-known that all the geodesics of S satisfy the same differential equation — namely, the equation describing the movement of a particle constrained to move without friction along the manifold S. Of course, the behavior of this differential equation and of its solutions heavily depends on the geometric properties of S.

In my talk, I will state a (still incomplete) description of the model-theoretic properties of this algebraic differential equation when S is a smooth, connected and compact real-algebraic surface with negative curvature.