François Fillastre: Realization of metrics on compact surfaces, an overview

The induced metric on a convex polytope of the Euclidean space is isometric to a Euclidean metric with conical singularities on the sphere. In the end of the 40's, A.D. Alexandrov proved that each such metric can be realised as the induced metric on (the boundary of) a unique polytope (up to global isometries).

Analog statements stand for the hyperbolic and spherical cases - and also for smooth metric.

In 1993 Rivin and Hodgson proves a theorem of realisation (of Riemannian metric) in a Lorentzian space-form (Schlenker 1996 for the smooth case).

In this talk, we present some statements extending these results to the higher genus (some are proved, some are just stated until yet), that leads to general statements about realisation of metrics on compact surfaces.

We will also present the common general method used to prove all these statements.

François Fillastre: Realisation of complete hyperbolic metrics on surfaces

We explain more explicitly the way to prove a hyperbolic statement for genus > 1 presented in the preceding talk. From this, it is possible to get a statement involving metrics with hyperbolic cusps, and we will explain why it is reasonnable to hope a general statement about (polyhedral) realisation of any complete hyperbolic metric on a surface.