

*Introduction to Riemannian geometry, curvature and Ricci flow, with applications to the topology of 3-dimensional manifolds. Part 1.*

The first lecture of the mini-course is an overview of modern Riemannian geometry and basics of geometric distances and curvature. Geometric distances measure the difference between Riemannian manifolds in such a way that isometric ones appear identical. The curvature tensor is defined in terms of the Levi-Civita connection and captures the local difference from a Euclidean space. Sectional curvature and Ricci curvature are derived from the curvature tensor. These local geometric invariants control many global aspects of a Riemannian manifold.