Geometric Analysis on the Space of Metric Measure Spaces

Karl-Theodor Sturm (Universität Bonn, Germany)

Abstract. The space of all metric measure spaces (X, d, m) plays an important role in image analysis, in the investigation of limits of Riemannnian manifolds and metric graphs as well as in the study of geometric flows that develop singularities. We show that this "space of spaces" – equipped with the L^2-distortion distance – is a challenging object of geometric interest in its own. In particular, we show that it has nonnegative curvature in the sense of Alexandrov. Geodesics and tangent spaces are characterized in detail. Moreover, classes of semiconvex functionals and their gradient flows on the space of spaces are presented.