Title: Synthetic Ricci curvature bounded from below for metric measure spaces and applications

Dr Christian Ketterer

Abstract:

The study of synthetic notions of lower Ricci curvature bounds has become a central topic in differential geometry and geometric analysis. These synthetic approaches extend the classical Ricci curvature concepts in the smooth context to a broader class of spaces, including Gromov-Hausdorff limits of Riemannian manifolds and metric measure spaces. They can play a crucial role in understanding the geometry and analysis of spaces with singularities.

In this talk, we will introduce some ideas behind synthetic lower Ricci curvature bounds. The focus is on curvature-dimension conditions that characterize lower Ricci curvature bounds. We will discuss how these conditions can be defined for general metric measure spaces and the connection with optimal transport.

Curvature-dimensions conditions are in particular useful to derive stability and almost rigidity theorems in Riemannian geometry. For instance, in a recent joint work with S. Honda, I. Mondello, R. Perales and C. Rigone we prove a stability theorem for Riemannian tori with almost non-negative Scalar curvature.