

Geometric Analysis on Metric Measure Spaces II

Time schedule:

- Tuesdays, 10:00 AM - 12:00 PM; SemR 0.008
- Fridays, 12:00 PM - 2:00 PM; SemR 0.008

Description of the course: Analysis on metric measure spaces (mms) has seen significant development in the last decades, and is an active research topic in analysis, geometry, and probability. In this course we will define the Dirichlet energy ("Cheeger energy") and the Laplacian on a metric measure space. On the other hand, we will introduce Dirichlet forms, that are an abstract notion of energies on functional spaces. We will see how these two approaches, the first more geometrical and the second more analytical, interact and when they coincide. We then investigate properties of these energy spaces, both from the analytical point of view (heat flow, spectrum of the Laplacian, functional inequalities) and from the geometrical one (examples of mms, geometric transformations and constructions).

Lecture notes will soon be available on the ecampus page. The table of contents of these notes can be downloaded from <https://wt.iam.uni-bonn.de/sturm/teaching>.

Prerequisites: Calculus 1-3, measure theory, some knowledge of PDEs and functional analysis, some knowledge of Riemannian geometry. Attendance at the course "Geometric Analysis on Metric Measure Spaces" (WS 25/26) is not required.