Master in Mathematics

Stochastic Riemannian Geometry

University of Luxembourg

Summer semester 2022 to turn in: 24 June 2022 at latest

Results of the course may be used without proof but should be quoted properly.

1. (Weitzenböck decomposition)
   (a) Describe the notion of a Weitzenböck decomposition.
   (b) What is the main example?
   (c) Give a stochastic representation of the heat flow with respect to an operator with Weitzenböck decomposition.
2. Explain the role of positive curvature in Bochner type vanishing theorems.
3. Give an equivalent probabilistic condition to a lower Ricci curvature bound.
4. (Gauss-Bonnet-Chern) What is the content of the Gauss-Bonnet-Chern Theorem.