Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, 15 May 2025, 16:30
Lipschitz-Saal (LWK 1.016)

Marie-Christin Bormann

University of Leipzig

Geometric analysis for Brownian motion on manifolds with non-standard boundary behaviour

We consider Brownian motion on manifolds with sticky reflection from the boundary and with or without diffusion along the boundary. For the invariant measure consisting of a convex combination of the volume measure in the interior and the Hausdorff measure on the boundary we show upper bounds on the Poincaré and logarithmic Sobolev constants under general curvature assumptions on the manifold and its boundary. The proof is based on an interpolation involving energy interactions between the boundary and the interior of the manifold. Additionally, we also present a Cheeger-type inequality to bound the spectral gap from below. As a side result we obtain explicit geometric bounds on the first non-trivial Steklov eigenvalue.
The talk is based on joint work with Max von Renesse and Feng-Yu Wang.