

Prof. Dr. Olaf Wittich: **Brownian Motion conditioned to Submanifolds**

Abstract: Let  $L$  be a closed Riemannian submanifold of a Riemannian manifold  $M$  and  $L(e)$  be a tubular neighbourhood of  $L$  in  $M$  of radius  $e$ . Conditioning the Brownian motion on the ambient manifold to stay within  $L(e)$  up to some finite time  $T$  yields an inhomogeneous Markov process on the tube. As  $e$  tends to zero, the corresponding measures converge weakly to a measure supported by the path space of the submanifold. The limit measure is equivalent to the intrinsic Brownian motion on the submanifold and the Radon-Nikodym density is of Feynman-Kac type. We discuss two different approaches to the limit measure and some applications.