The Geometric measure theory of the Brownian path

Abstract:

Let B denote the range of the Brownian motion in \( \mathbb{R}^d \). For a deterministic Borel a measure \( \nu \) we wish to find a random measure \( \mu \) such that the support of \( \mu \) is contained in \( B \) and the expectation of \( \mu \) is \( \nu \). We discuss when exactly can there be such a random measure and construct in those cases. We establish a formula for the expectation of the double integral with respect to \( \mu \), which is a strong tool for the geometric measure theory of the Brownian path.