

On Random Geometry: Brownian motion and Gaussian Free Field

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Abstract: For "random curve", a natural and classical model is Brownian motion; when it comes to "random surface", a promising candidate model is Gaussian free field (GFF), which can be seen as the analog of Brownian motion with multi-dimensional time parameters. In this talk, we will introduce GFF from the viewpoint of infinite dimensional Gaussian measure, discuss some problems arising from the study of geometric properties of GFF, and explore the role of GFF in the construction of random geometry. The field of random geometry (associated with GFF) is developing fast, with many problems worth investigating. This talk can only give a (extremely limited) glimpse into this broad and rich topic.