
BERN-FRIBOURG GRADUATE SEMINAR

a seminar for Master and PhD students

Thursday 26th October, 2023: 17:15 - 18:00

Room B6, Exakte Wissenschaften, Bern

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Percolation from a quantum gravity perspective

Abstract

The study of statistical physics models in two dimensions at criticality is in general a notoriously difficult problem. In the 80s, three physicists, Knizhnik, Polyakov, and Zamolodchikov, came up with a novel and far-reaching approach in order to understand the critical behaviour of these models. The main underlying idea of their approach is to consider these models, not on regular lattices of the plane (such as \mathbb{Z}^2), but on well-chosen random planar lattices; this corresponds to studying these models in their quantum gravity form. Somewhat remarkably, many models of statistical physics become easier to analyse on random planar lattices than on regular lattices, as some of the geometric aspects of the problem disappear or can be disregarded. In this talk, we shall study one of the simplest of such models: Bernoulli site percolation on random triangulations. More precisely, we will be interested in the geometry of critical percolation clusters. A combination of analytic combinatorics methods and purely probabilistic arguments will allow us to determine the scaling limit of cluster boundaries.