Soutenance de thèse de doctorat

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Mardi 25/06/2019, 14h00

Orme des Merisiers Amphi Claude Bloch, Bât. 774

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IPhT

Geometric lattice models and irrational conformal field theories

In this thesis we investigate several aspects of two-dimensional lattice models of statistical physics with non-unitary features and their associated irrational conformal field theories. We first address two problems related to the Chalker-Coddington model, an infinite-dimensional supersymmetric chain important for the study of the plateau transition in the integer quantum Hall effect. Since the model has an infinite number of degrees of freedom, it has been proposed to study it with a series of truncations. The presentation starts with a pedagogical example based on the Brownian motion and self-avoiding walks. We present new results based on this truncation procedure. Next, a new model is proposed to interpolate the class A and the class C of the quantum Hall effect. The Chalker-Coddington model is a particular realisation of class A whereas class C, describing the physics of the spin quantum Hall effect, can be related to a model of percolation. In the last part of this presentation, we study the problem of the entanglement entropy in non-unitary spin chains and its interpretation in loop models. We discuss the role of the effective central charge.