

Boundary critical behavior of the 3D $O(N)$ model

Friday, 14 June 2024 10:00 (1 hour)

In critical phenomena, the presence of surfaces or more general boundaries gives rise to rich phase diagrams and interesting phenomena, such as critical adsorption and critical Casimir forces. Despite being a mature subject, boundary critical phenomena have recently attracted a renewed attention, driven in particular by the discovery of unexpected behavior in various quantum spin models, and by progresses in conformal field theory.

In this context, a reexamination of the simplest model of boundary criticality – the three-dimensional $O(N)$ model bounded by a bidimensional surface – has led to the discovery of a hitherto overlooked boundary phase, the so-called extraordinary-log phase.

Beyond surfaces, other kind of extended defects, such as line defects, have been considered.

In this seminar I will give an introduction to the problem and review the recent advances, focusing in particular on results of numerical simulations, and discuss future research directions.

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