

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: **LPTMS**

CNRS identification code: **UMR 8626**

Internship director's surname: **Alberto Rosso**

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Internship location: **Parus-Saclay**

Thesis possibility after internship: YES

Funding: NO

If YES, which type of funding:

Title: Conformal field theory approach to low-dimensional critical statistical models

In recent years, my collaborators and I have been at the center of research aimed at understanding the universal properties of geometrical statistical models, where the main objects of study are non-local structures, such as the magnetic domains of the Ising model. This research has shed new light on solutions of conformal field theories (CFTs) and deepened our understanding of how scale (conformal) invariance is implemented at the quantum level.

Building on this foundation, I would now like to explore new domains where conformal invariance is expected to manifest in novel ways—specifically, in statistical models with disorder and/or long-range interactions.

During this stage, the student will be introduced to concepts of the renormalization group, particularly in the context of perturbed conformal field theories. Our goal is to carry out the first analytical computations demonstrating that the disordered (or long-range) critical points do not belong to any of the CFTs known so far.

This stage is intended to lead naturally into a master's thesis, to be conducted in collaboration with **Marco Picco (LPTHE)**.

Please, indicate which speciality(ies) seem(s) to be more adapted to the subject:

Condensed Matter Physics:	YES/NO	Soft Matter and Biological Physics:	YES/NO
Quantum Physics:	YES/NO	Theoretical Physics:	YES/NO