

Master 2: *International Centre for Fundamental Physics*

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: LPTMS

CNRS identification code: UMR 8626

Internship director's surname: V. Terras and N. Kitanine

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Phone number:

Web page:

Internship location: LPTMS - Bâtiment Pascal n° 530

rue André Rivière - Université Paris-Saclay

91405 Orsay CEDEX, FRANCE

Thesis possibility after internship: YES

Funding already obtained for a PhD: NO

If YES, which type of funding:

Out-of-equilibrium dynamics of integrable open spin chains

Quantum spin chains constitute a rare example of quantum many body interacting systems where several important physical quantities can be exactly computed. This property (quantum integrability) together with numerous theoretical and experimental applications makes these systems a perfect testing ground for non-perturbative approaches in quantum field theory.

One of the most intriguing (experimentally observable) features of quantum integrable systems including spin chains is their out-of-equilibrium behaviour. We propose to study, using integrability techniques, the out-of-equilibrium properties of open spin chains where a rapid change of a boundary magnetic field can produce a macroscopic change of the system.

The goal of the internship is to learn the main methods of quantum integrability (algebraic Bethe Ansatz, separation of variables) and how these methods can be applied for the computation of scalar products and form factors in open spin chains. This first step will be necessary for the further study of the relaxation dynamics after a sudden change (quench) of a boundary magnetic field.

This internship will ideally be followed by a PhD, in co-direction between V. TERRAS (LPTMS, Université Paris-Saclay) and N. KITANINE (professor, Université de Bourgogne). The location of the internship and PhD will be in LPTMS.

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

Condensed Matter Physics: YES

Soft Matter and Biological Physics: NO

Quantum Physics: YES

Theoretical Physics:

YES