

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: CPHT
CNRS identification code: UMR 7644
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Internship location: CPHT, Ecole Polytechnique

Thesis possibility after internship: YES

Funding: NO

If YES, which type of funding:

Non-perturbative approaches to strongly-correlated phases of matter

Strongly-coupled phases of matter such as are found in the strange metallic phase of high T_c superconductors deviate strongly from the Landau theory of Fermi liquids, which captures the low-energy physics of conventional metals. This suggests that the low-energy degrees of freedom are not weakly-coupled quasiparticles. Non-perturbative approaches which do not take quasiparticles as a starting point are gauge/gravity duality (aka holography or ads/cft) and hydrodynamic effective theories. The purpose of this internship is to explore how such methods may be applied to strongly-coupled phases of matter.

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: NO

Theoretical Physics: YES