

Master 2: *International Centre for Fundamental Physics*

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: MSC (Matières et Systèmes Complexes)

CNRS identification code: UMR7057

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Internship location: ESPCI, labo Gulliver (UMR 7083)

Thesis possibility after internship: YES

Funding: NO

Title: Memory in Material

Summary (half a page maximum)

Any memory requires some material to be stocked (DVD, USB key, brain, ...).

The ultimate memory material may be a single atom, electron, photon, ... (?)

Our main question is, in the disordered material, what information is memorized and how ?

We have approached from both non-equilibrium statistical physics (spin models "Progressive Quenching"

on arXiv, elasto-plastic model, PRL) and soft-material physics (glassy rubber, PRL).

Proposition of stage M2, which can go on to Thesis, is

the modelling and numerical experiments of the yielding fluid, where the flow history is stocked in "friction" and recalled as "drying fracture".

Experiments have been accumulated and the theoretical approach has just being started.

In stage M2 we will make 2D model and do the numerical test.

In thesis, 3D modeling, its numerical experiments, and statistical analysis will be envisaged.

See please, https://www.pct.espci.fr/~sekimoto/sekimoto_hp_espci.html for more info.

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

Condensed Matter Physics: YES/ Macroscopic Physics and complexity: YES/

Quantum Physics: /NO Theoretical Physics: YES/