

INTERNSHIP PROPOSAL

(One page maximum)

Laboratory name: Physique de La matière Condensée

CNRS identification code: UMR 7643

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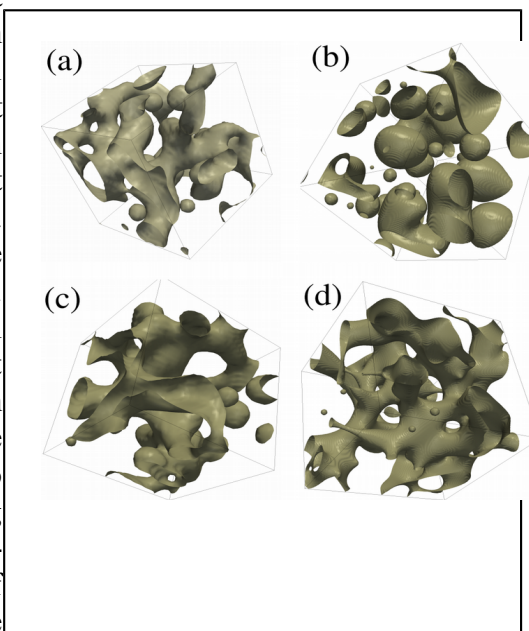
Internship location: École Polytechnique, Palaiseau

Thesis possibility after internship: YES

Funding: NO (Possibility through Ecole Doctorale)

Numerical study of phase separation induced by transport in ternary systems.

Phase separation is an ubiquitous mechanism that induces the transition from an homogeneous system to a multiphase material. It is well understood in bulk binary and pseudo binary systems where it leads to complex patterns that evolve through coarsening (decrease of the surface energy that induces an increase of the characteristic length). However, in most systems of interest, the phase separation takes place in heterogeneous systems. For instance it can be induced by the evaporation of one of the constituents of a ternary system that induces phase separation. The description of such systems is of strong practical interest since the properties of the material are intimately related to its microstructure. Predictions can be made using mathematical modeling such as the ternary Cahn-Hilliard model. In this internship, the effects of transport induced heterogeneities on the phase separation will be studied numerically through simulations of the Cahn Hilliard equation.



This will allow to investigate, for instance, the effects of wetting on the microstructure or the effect of the evaporation rate during an evaporation induced phase separation.

