

**Open PhD position in soft matter physics and bio-informatics – Metz, France:**  
**Protein-membrane and protein-protein interactions modeled with soft objects**

We are accepting applications for a three-year PhD position on a project that will be performed in the Laboratoire de Physique et Chimie Théoriques (LPCT) in Metz (France). The project focuses on the building of a description of protein-protein and protein-membrane interactions in which protein domains or secondary structure elements are deformable soft objects. This project is connected to several possible experimental applications which will be in particular realized in collaboration with Academia Sinica, Taiwan in the framework of an International Research Project ([www.gesp.cnrs.fr](http://www.gesp.cnrs.fr)).

**Short description, goals**

The PhD project intends to develop a soft-matter model describing the interaction between proteins and membranes. Most widely used coarse-grained models, like Martini, take a bottom-up point of view in which the full-atom description of amino-acid residues is replaced by a description with a smaller number of beads. Each of these beads is determined by merging a few atoms. We propose to explore a top-down point of view in which we aim at handling the proteins as soft objects whose shape is close to the shape of the molecular surface of the considered protein. The surface shape will be maintained using a tensegrity scheme that has already been tested on simple secondary structure elements. The modeling of the interactions of such soft objects with the membrane will permit to explore large structural transitions thanks to the smaller number of degrees of freedom.

**Requirements**

We are seeking a highly qualified PhD candidate with an excellent academic record, particularly demonstrated by outstanding grades at the Master's level, in alignment with the rigorous standards of our PhD school. Successful candidates must hold a Master's in physics or chemistry and possess knowledge of soft matter physics and/or molecular dynamics simulations. Familiarity with computing programming (python) is essential. Good knowledge of English, both written and oral, is compulsory.

**Funding**

We acknowledge funding from the Lorraine Université d'Excellence (LUE) program. The salary is fixed according to the national policy for PhD salaries in France (about 38k€/year, gross salary). The position gives access to the French Social Security system. An additional grant of 15 k€ will be provided to the PhD student for attending conferences, international mobility, small supplies.

**Contacts (PhD advisors)**

**Contacting the advisors is compulsory to learn about the application procedure.**

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