

PhD position

A PhD position co-financed by **Université Grenoble Alpes (UGA)** and the **Institut Laue-Langevin (ILL)** is available on the following subject:

"Biophysical Changes in Lipid Bilayers Induced by Alix and CHMP Proteins: Insights into Membrane Deformation during Endocytosis"

All cells are enclosed by a membrane composed of lipids and proteins. Membrane deformation, which is essential for a vast number of biological processes, occurs through specialized cytosolic proteins that polymerize on lipid membranes. Among these are the proteins of the Endosomal Sorting Complex Required for Transport (ESCRT) including Alix, CHMP2, CHMP3 and CHMP4 which interact with the lipid bilayers. The aim of the present project is to shed new light on the molecular mechanisms leading the interaction of CHMP and Alix proteins with lipid bilayers, and understand how these interactions modify the lipid bilayer architecture and dynamics in a way which leads to their deformation, fusion and fission. This understanding will be achieved by combining membrane biophysics, structural biology with neutron scattering from large-scale techniques to reveal key nanostructural and dynamic insights into ESCRT proteins interactions with model membranes.

The project will involve the collaboration of three institutes, the **Laboratoire des Matériaux et du Génie Physique (LMGP)**, the **Institut de Biologie Structurale (IBS)** and the **Institut Laue-Langevin (ILL)** all located in the Grenoble area. The PhD student will be jointly supervised by Dr. M. Maccarini (LMGP), Dr. C. Chatellard (IBS) and Dr O. Czakkell (ILL).

The Laboratoire des Matériaux et du Génie Physique is a research laboratory affiliated with Grenoble INP and the CNRS, specializing in materials science and engineering physics. Its work focuses on the design, growth, and characterization of advanced functional materials for applications in fields such as nanotechnology, microelectronics, energy and health.

The Institut de Biologie Structurale is a multidisciplinary research institute located in Grenoble, jointly operated by the CEA, CNRS, and Université Grenoble Alpes. It is internationally recognized for its contributions to structural biology, particularly in understanding the molecular mechanisms of biological processes. Researchers at IBS use cutting-edge methods such as X-ray crystallography, cryo-electron microscopy, NMR spectroscopy, and biophysics to study the structure and function of biomolecules, with applications in health, biotechnology, and fundamental biology.

The Institut Laue-Langevin is an international research centre at the leading edge of neutron science and technology. As the world's flagship centre for neutron science, the ILL provides scientists with a very high flux of neutrons feeding some 40 state-of-the-art instruments, which are constantly being developed and upgraded.

Expected profile and skills:

- Degree allowing enrolment for a PhD (such as MSc, Master 2 de Recherche, Laurea or equivalent) in physics, materials science, chemistry, biology or closely related science
- The candidate should be able to work in a highly interdisciplinary environment.
- Background in large scale facilities experiments (neutron and x-ray scattering), and knowledge computer programming (C++, Python) would be an advantage
- Experience in handling of biological materials would be an advantage

Questions and applications (CV + motivation letter) should be addressed to:

- marco.maccarini@univ-grenoble-alpes.fr
- christine.chatellard@univ-grenoble-alpes.fr
- czakkelo@ill.fr

Working Conditions

The successful candidate will be enrolled full-time in the doctoral school of UGA and based 50% at the ILL (Grenoble, France) and 50% at LMGP and IBS. Furthermore, a varied pedagogical training programme will be offered to the successful candidate throughout the 3-year PhD project.

Deadline for application and starting period

The application should be sent by **15th of June** for a start in autumn 2025.