NEUTRONS FOR SOCIETY

UNIVERSITY OF GRAZ
Department of Molecular Biosciences

UNI GRAZ

PhD position

Integrating Mesoscale Membrane Dynamics into the Analysis of Lipid Vesicles

Lipid vesicles are indispensable model systems for membrane biophysics and drug-delivery research. While conventional small-angle scattering (SANS/SAXS) provides exquisite nanoscopic structural detail, it rarely captures the crucial mesoscale dynamics that govern membrane function.

Your Mission: Develop a multiscale scattering model that bridges nanoscopic and mesoscopic structure and dynamics.

- ✧ **Mathematical Modeling:** You will combine rigorous mathematical modeling to create a predictive tool that spans orders of magnitude in length and time.
- ✧ **Hands-On Numerical Modeling:** Implement your model in a custom-made data analysis tool that uses advanced optimization routines.
- ✧ **Hands-On Experimentation**: Validate your models with SANS, SAXS, and neutron-spin-echo (NSE) measurements on ILL beamlines.
- ✧ **Open-Source Impact**: Release a fully documented, community-ready software package that will become a reference for researchers worldwide.

Desired profile:

- ✓ MSc (or equivalent) in **Physics**, Chemical Physics or related fields;
- ✓ Robust background or proven skills in **mathematics** (e.g., statistical analysis, numerical modeling, optimization) – essential for data interpretation and model development;
- ✓ Background in **scattering techniques** (SANS/SAXS) and/or data modelling is a plus;
- ✓ Experience with **programming** (e.g. Python) is a plus;
- ✓ Familiarity with membrane biophysics or soft matter physics is advantageous;
- ✓ Strong written and oral communication skills in English;
- ✓ Ability to work independently and collaboratively in an international environement;
- ✓ Scientific commitment, creativity and team spirit.

What we offer:

- ✓ **A unique research environment**: Employment in a top-notch international and interdisciplinary setting at the interface of physics, chemistry and biology;
- ✓ **Duration and location**: 3 years (full-time), with the first year spent at the University of Graz, Department of Molecular Biosciences, Austria, and the remaining two years at the Institut Laue-Langevin (ILL) in Grenoble, France;
- ✓ **PhD enrollment**: The successful candidate will enroll in the PhD program at the University of Graz. During the first year, the succesful candidate will be supported and encouraged to foster collaboration and early integration into the research environment at ILL;
- ✓ **Skill-development opportunities:** Gain hands-on experience with cutting-edge experimental techniques, advanced scattering-modelling methods, and open-source software development.

Application procedure and contact:

Applications and informal enquiries must be addressed via e-mail to Dr. Enrico F. Semeraro (enrico.semeraro@uni-graz.at), Prof. Georg Pabst - Pabst Lab (georg.pabst@uni-graz.at), and Dr. Sylvain Prévost (prevost@ill.fr).

To submit the application, please provide the following documentation in **PDF** format:

- ✓ Cover letter stating your motivation and expertise (max one page);
- ✓ Curriculum vitae, detailing your academic and professional background;
- ✓ Copies of Master of Science diplomas and transcripts;
- ✓ Up to two letters of recommendation (max one page).

In the subject line of your email, please state "UniGraz-ILL PhD - [Your Name]".

The deadline for applications is: April 6th, 2026.

Preferred start date for the PhD project: Spring/Summer 2026 (*depending on the number of applications, only shortlisted candidates for the interview will be informed of the outcome of their application*).