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## FASEM for Life Science: from experiments to data analysis

We propose a 5-day **advanced school**, called “**FASEM (French-Swedish Academy for Scattering Experiments and Modeling) for Life Science: from experiments to data analysis.**”

The FASEM school will be held in **Lund**, Sweden, on **March 11-15, 2024**.

Following the success of the first FASEM edition (*French and Swedish School on Energy Materials*) in 2019, the French Neutron Society (SFN) decided to organize a second edition of this type of school. FASEM could ultimately become a recurring thematic school in different fields of application.

### Goals and Objectives

The main objective of this advanced school is **to train young researchers in biology, biophysics, pharmacology, etc. to the use of X-ray (XR) and neutron scattering structural techniques** (crystallography, small-angle scattering, reflectometry), **ranging from experiments to complete and in-depth analysis of the data**, based on mathematical and modeling approaches (*e.g.* analytical fits, *ab initio* modeling, artificial intelligence, Bayesian and multimodal methods). The complementarity of these scattering techniques with other structural biology methods, such as NMR, will be considered as well.

Another objective of FASEM is to promote the use of XR and neutron large-scale facilities, which are not yet currently used in biology. The new European neutron source (ESS) in Lund, to be commissioned in 2025, and the 4<sup>th</sup> generation synchrotrons will lead to a significant breakthrough in scattering techniques, opening particularly interesting perspectives for structural biology. FASEM will take place in Lund in order to encourage French and Swedish researchers to explore the new possibilities offered by these resources.

Therefore, the school will propose lectures (theory, hands-on, applications, highlights), discussion sessions, and visits to the MAX-IV and ESS, respectively XR and neutron sources in Lund.

The **objectives** are:

- Train young researchers, doctoral students, and post-doctoral fellows in biology and biophysics, eventually coming as well from related fields such as pharmacology, virology, food science, etc., interested in advanced techniques using XR and/or neutron scattering, with the aim to use the most relevant experimental techniques for their present or future research.

- Train participants to scattering and modelling tools to process, analyse, and interpret their experimental data and extract all possible information.
- Highlight the contribution of these techniques to the study of biological macromolecules and their complementarity with other methods of investigation in structural biology (NMR, cryo-EM, etc.).
- Create and strengthen links between the community of biologists (in the broad sense) and that of XR and neutron large-scale facilities.
- Develop and strengthen sustainable scientific exchanges between the French and Swedish communities on the use of large-scale facilities, in connection with the forthcoming ESS commissioning.

## Financial Support

The current **financial sponsors** include the Laboratoire Léon-Brillouin (LLB, France), the French neutron scattering federation (2FDN), the French scientific research national centre (CNRS), ESS, and the French Embassy in Sweden. The **in-kind support** includes LLB, ESS, French Embassy, and LINXS (the Swedish institute which promotes XR/neutron links with universities in Lund).

The details of the proposed incomes and the expenses will be provided on-demand. Volunteering and in-kind support and the fact that a few students and lecturers are already in Lund is taken into account. We are considering 30 students and about 10 lecturers, one-half of the students coming from French organisations and another half from Swedish ones.

Since we aim at developing a recurring thematic FASEM school in different fields of application, we are calling for a larger support from the scattering communities. Please contact the organizing committee to express your interest and intention to sponsor these events.

## Organizing team

This school will be organized by LLB, ESS, French Embassy, and LINXS

The organizing team is composed of:

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|---|----------------|
| ● Sophie Combet <a href="mailto:sophie.combet@cea.fr">sophie.combet@cea.fr</a>  | LLB (CEA-CNRS) |
| ● Christine Darve <a href="mailto:christine.darve@ess.eu">christine.darve@ess.eu</a>                                  | ESS            |
| ● Rose-Adeline Fakoury <a href="mailto:science@ifsuede.com">science@ifsuede.com</a>                                   | French Embassy |
| ● Valérie Lemarquand <a href="mailto:valerie.lemarquand@diplomatie.gouv.fr">valerie.lemarquand@diplomatie.gouv.fr</a> | French Embassy |
| ● Josefín Martell <a href="mailto:josefin.martell@linxs.lu.se">josefin.martell@linxs.lu.se</a>                        | LINXS          |
| ● Anna Ntinidou <a href="mailto:anna.ntinidou@linxs.lu.se">anna.ntinidou@linxs.lu.se</a>                              | LINXS          |
| ● Esko Oksanen <a href="mailto:esko.oksanen@ess.eu">esko.oksanen@ess.eu</a>   | ESS            |
| ● Wojciech Potrzebowski <a href="mailto:Wojciech.Potrzebowski@ess.eu">Wojciech.Potrzebowski@ess.eu</a>                | ESS/DMSC       |
| <br>  |                |
| <u>Advisers:</u>  |                |
| ● Trevor Forsyth <a href="mailto:trevor.forsyth@med.lu.se">trevor.forsyth@med.lu.se</a>                               | LINXS          |
| ● Giovanna Fragneto <a href="mailto:giovanna.fragneto@ess.eu">giovanna.fragneto@ess.eu</a>                            | ESS            |