

**Title:** NXUS - *Neutron and X-ray User Support to strengthen industrial use of small-angle scattering techniques*

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**Abstract:**

NXUS - *Neutron and X-ray User Support* is a pilot project based at University of Copenhagen that promotes industrial use of X-rays and neutrons through collaborations with university based experts. Two world-leading research facilities are being built in Lund, Sweden in these years: The MAX IV Synchrotron and the European Spallation Source (ESS). Together, the two complementary facilities will provide new opportunities for both industry and academia for studying the structure and dynamics of soft and hard materials. Academic research groups are already strongly represented at existing facilities and it is expected that this will continue at ESS and MAX IV. However, many potential industrial users find it less obvious how they can benefit from both the existing and the upcoming facilities. The goal of the NXUS project is to show a way through this by providing extensive user support for selected industrial use-cases within SAXS and SANS. A research project is identified and co-developed between the industrial partner and the NXUS scientists. The detailed experiment is designed and carried out by the NXUS scientists who are then in charge of both beamtime, subsequent data analysis and reporting back to the company. During the work process, plenty of interaction ensures 1) that the company's knowledge about the sample is incorporated in the analysis and 2) that NXUS remains focused on solving the questions of the highest possible relevance to the company. NXUS was initiated in the autumn of 2013. 10 projects were carried out in the first phase of the project within as diverse areas as peptide based pharmaceuticals, water purification, dairy products, detergent enzymes, paint and catalysts. Examples of these industry projects will be presented and experience harvested from the NXUS project will be discussed.

NXUS (see [www.nxus.dk](http://www.nxus.dk)) is co-funded by University of Copenhagen and Capital Region of Denmark.

**Short biography:**



Lise Arleth is professor in experimental Biophysics at the Niels Bohr Institute, University of Copenhagen. Her research group specialises in Small-angle X-ray and Neutron Scattering of biological macromolecules and self-assembled systems. During the last five years the group has focused extensively on developing more optimal approaches and methods for SAXS/SANS structural investigations of membrane proteins under solution conditions. The first goal was to obtain static structural information. The present goal is to obtain access to dynamic/time-resolved information as well as flexibility for the membrane protein systems investigated. Lise Arleth's group is mainly using the very homogeneous, so-called nanodiscs as molecular sample holders for the membrane proteins. However, more recently, approaches based on contrast variation SANS are also being investigated. The research requires a strong joint effort in order to, on one side, understand and control the complex behavior and properties of biological molecules and their self-assembly and on the other hand, develop mathematical modeling software tools to analyse the obtained SAXS and SANS data. Building on this expertise, Lise Arleth initiated the *NXUS - Neutron and X-ray User Support* project in the autumn of 2013. NXUS is an industry outreach pilot project that aims towards making the small-angle scattering techniques and large scale facilities more accessible to industrial users.