FASEM 2026

Monday, 16 March 2026 - Friday, 20 March 2026

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Book of Abstracts

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Neutron and x-ray reflectometry for the study of thin films and interfaces

Author: Maximilian Wolff[None]

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Neutron and x-ray reflectometry are complementary methods that allow the study of thin films and interfaces. I will discuss the basic principles of reflectometry experiments and data analysis. From specular reflectivity density profiles long the normal of interfaces can be extracted, while off-specular and grazing incidence scattering provides information about in-plane correlations. Examples in hydrogen storage, magnetism and polymer science will be presented.

2

Hydrogen storage: Finite size and proximity effects

Corresponding Author: max.wolff@physics.uu.se

Hydrogen will play a major role as energy carrier in the transition towards a sustainable and carbon dioxide emission free society. I will discuss the opportunities and challenges to store hydrogen. Emphasis will be on proximity and finite size effects, which allow to tune the absorption properties, specifically, the charging kinetics, gravimetric and volumetric capacity as well as efficiency of discharging.

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Small Angle Scattering: Leaving Atoms Behind and Going Big

Author: Xaver Brems[1]

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Many processes in energy materials do not only depend on the microscopic arrangement of atoms on the atomic scale, but are controlled by the gross characteristics and morphology of matter on the nano and microscale. Small-angle X-ray/neutron scattering (SAXS/SANS) allows to access these features giving insights into the size, shape, and arrangement of objects of few nanometers to several hundreds of nanometers. This lecture will introduce key concepts of small-angle scattering and give some examples on how SAXS and SANS can be used to study battery materials.

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Operando characterizations of batteries : from particles to devices

Author: Sandrine Lyonnard[1]

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Understanding key reaction and degradation mechanisms in batteries require to combine different characterization tools and obtain structural, chemical, morphologicak insights into the materials transformations, from the scale of individual active particles to the scale of a working commercial battery device. Neutrons and X-rays are particularly suited for this purpose. We will show some recent examples of their application in the field.

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Adoption of Non-Sealed Radioactive Source Technologies and the Management of Disused Sealed Radioactive Sources (DSRS)

Author: Franck Cocina[None]

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Sealed Radioactive Sources (SRS) have long served as the standard means of delivering ionizing radiation across applications in medicine, research, public health, and industry. In recent years, however, advances in non-SRS based technologies have expanded the availability of viable alternatives capable of achieving equivalent, and in some cases superior, performance. While radioactive sources may remain the preferred option for certain cases, access to these alternative technologies potentially reduce the safety, security, regulatory, and end-of-life management obligations traditionally associated with sealed radioactive sources.
Although the adoption of alternative technologies can reduce long-term reliance on radioactive materials, the transition from the traditional SRS-based technologies may also generate disused sealed radioactive sources (DSRS). These DSRS, depending on the isotope and activity, can remain dangerous for years to centuries and therefore require safe, secure, sustainable management that ultimately ends in disposal. Drawing on experiences from multiple States that have undertaken such transitions, this presentation highlights both positive outcomes and implementation challenges, emphasizing the need for coordinated planning and technical support mechanisms. The discussion will balance the assessment of technological, regulatory, and strategic considerations relevant to decision makers evaluating future equipment procurement and focus on DSRS management strategies. It also outlines current international eUorts and assistance programs aimed at supporting States in assessing, adopting, and managing alternative technologies responsibly.

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Registration

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Welcome address and presentation of ILL

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Introduction to X-rays and Neutrons for Materials Science and

Energy

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An Introduction to Neutron and X-ray Imaging

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ESRF welcome (Visitor Center) and visit

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Poster Session & reception (mezzanine ESRF)

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Materials for nuclear reactor and fusion plants

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In this lecture, we will discuss what types of materials are used in nuclear fission and nuclear fusion reactors, how they are affected by the specific reactor environments, and how we can study their properties, characteristics, and evolution under operation and transient conditions. We will focus on materials close to the reactor cores that experience some of the harshest engineering conditions ever encountered. Intense radiation fluxes, high temperatures and temperature gradients, corrosive environments, and variable stress states affect these materials.

We will discuss nuclear fuels, structural materials, and the specificities and commonalities between fission and fusion reactors and their materials, as well as current research and development efforts in the field. The lecture will provide students with a broad overview of the topic and will also include deep dives into certain specific materials, modelling and experimental subtopics. In particular, the use of diffraction techniques will be highlighted.

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Neutron and X-ray Diffraction (for Energy Materials)

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Neutron spectroscopy

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X-ray spectroscopy

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Neutron & X-ray Reflectometry

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ILL visit

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Energy research in industry

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DFT Modelling

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Artificial Intelligence in Data Analysis

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Neutron spectroscopy studies of perovskites for energy applications

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TBA

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Student Clips

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Neutrobn Imaging for energy Applications

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In this lecture the potential of neutron imaging for energy applications will be outlined, including advanced neutron imaging techniques and their capabilities in the given context. Examples of a broad range of studies including but not limited to the fields of nuclear energy, batteries, and fuel cells will be provided.

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Societal impact of energy research

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Round table: Energy research with an impact

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Closing remarks & Clip Awards