Satellite Workshop "Neutrons for Batteries"

18th November 2026 – MAX IV, Lund

Organisers: S. Lyonnard, Q. Berrod, A. Matic, M. Bianchini, S. Cussen

Scope Novel materials and technologies are required to meet the goals for **better, safer, and more sustainable batteries.** In the quest to meet the society demand and accelerate battery research towards innovation, advanced characterization tools are needed to uncover the many reaction and degradation mechanisms that take place in the bulk of electrodes and electrolytes, and at their interfaces. Due to the extended spatiotemporal window to cover, many experimental techniques are needed to capture chemical and structural changes in the materials during the charge and discharge cycles, both in the early cycles (beginning of life) and after long-term operation (at the end of life).

Neutron techniques are advantageous due to their non-destructive character, high penetration power (suited to investigate bulk samples and large objects as battery cells), together with chemical sensitivity (particularly to isotopes) and relatively high space and time resolutions enabling operando measurements. **Neutron Powder Diffraction, Small Angle Neutron Scattering and Neutron Imaging** are used in the community to perform structural and morphological studies, while molecular-scale dynamics can be accessed using **Inelastic/Quasi-elastic Neutron Scattering.** Although neutron tools have been applied to a variety of problematics in Li-ion and beyond Li-ion technologies, including recently to the case of solid-state battery, there are many challenges arising from the continuous need to increase detection limits, push resolutions, and measure key parameters in relevant electrochemical environments and conditions. This symposium will offer a platform for discussing the latest developments in neutron characterization of battery materials and devices, highlighting strengths and pitfalls, and providing a critical discussion to design community-adopted challenges and perspectives.

Programme

8h30-9h15 Vanessa Peterson, ANSTO,
Studying batteries: Trends, Challenges and Opportunities

9h15-10h Serena Cussen, University of Dublin, *Muons and Neutrons for battery research*

Coffee Break

10h30-11h Kristina Edström, Uppsala University,
History and Future of neutrons for battery research, where do we go?

11h-12h Round table & discussions, Introduction by Q. Berrod and S. Lyonnard,
New mechanisms at large scale facilities: the Battery Hubs model.

Zoom link: https://ill.zoom.us/j/91272738697
Please contact sandrine.lyonnard@cea.fr or berrod@ill.fr for venue details.

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