

XProLas: Collaborative project: Application of laser-driven X-ray sources in production monitoring and analytics

Subproject: »2D X-ray absorption spectroscopy in the laboratory«

We seek to hire a highly motivated postdoc (approx. 2.5 years) in experimental physics or related fields for the collaborative project "XProLas-Application of laser-driven X-ray sources in production monitoring and analytics". The ideal candidate will have a strong background in X-ray microscopy, spectroscopy, or diffraction. Solid hands-on experience using X-ray laboratory or synchrotron radiation for in-situ material characterization is preferred. Additionally, the successful candidate should demonstrate excellent organizational and communication skills, both verbally and in writing.

Suitable candidates are encouraged to contact us for further information or directly apply by sending an email to

Prof. Jan Ingo Flege (flege@b-tu.de) or
Prof. Ehrenfried Zschech (zschech@b-tu.de).

About the Project

Integrating X-ray microscopy (XCT) and X-ray absorption spectroscopy (XAS) results in a spatially resolved microspectroscopic technique that traditionally requires a tunable synchrotron radiation source. In our subproject within the XProLas framework, we will develop a combined n-XCT/2D-XAS in close collaboration with PVA Technology Hub GmbH. As part of this collaborative academia-industry project, we will address this challenge by integrating a laser-induced X-ray source.

We will explore novel battery and catalyst materials as reference systems, including time-resolved charging and discharging processes in batteries observable with a spatial resolution of $\leq 1 \mu\text{m}$. These studies will significantly enhance our understanding of aging mechanisms in battery cells, aiding their optimization and potentially leading to the development of new battery types. We also expect similar insights regarding the aging processes in catalysts, where oxidation or reduction processes occur alongside material transport.