

## **Small Angle Scattering and its Application in Life and Material Science**

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Small Angle Scattering is a versatile technique implemented on all synchrotrons and many laboratories all over the world, which provides information on nanostructures about dimension, shape, aggregation state from roughly 1 nm to > 100 nm. All states of matter, i.e. solid, liquid, gas phase and last not least surfaces can be probed. The opportunity to investigate the samples in their “natural” environment and with high time resolution is one of the strong points of this technique.

This lecture is divided in two sections: The first should provide a general introduction to the theory of small angle scattering with a special focus on the interplay between the experimental data and the Fourier transformation into the real space. Here also some concepts of the BioSAXS method will be presented.

The second part is focusing on the application of the technique to investigate various systems from chemistry to structural biology, which should highlight the power of the technique to tackle specific problems of current research in life and material science. Here the focus will be on in situ and in operando investigations down to the ps-time regime, which is the current focus at the Austrian SAXS beamline at ELETTRA.