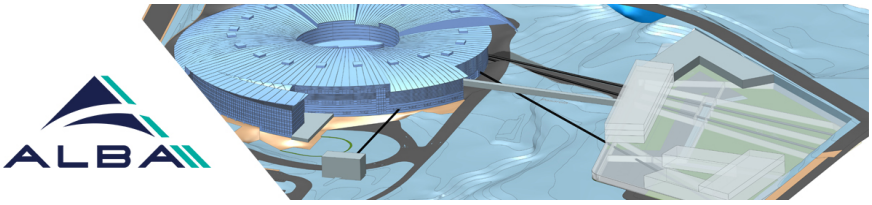

Contribution ID: **10** Type: **not specified**

Probing matter at the nano-to-mesoscale in the real and reciprocal space with chemical and bond-orientation sensitivity

Tuesday, 15 November 2022 10:15 (10 minutes)

A beamline with two endstations is envisaged. One of the endstations will be devoted to Resonant Soft X-ray Scattering (RSoXS) and the other one to Scanning Transmission X-ray Microscopy (STXM) + ptychography. Scanning Transmission X-ray Microscopy and Resonant Soft X-ray scattering are complementary techniques to probe the nano-to-mesoscale structure of soft condensed matter, in the real and reciprocal space, respectively. It has been demonstrated that by using variable wavelength X-ray probes around the light element absorption edges of carbon, nitrogen and oxygen, the resonant behavior of chemicals containing these elements can be used as fingerprints of the molecular bonding environment, including the molecular orientation. The unique chemical and orientational sensitivities of both, RSoXS and STXM, arise from the energy- and polarization-dependent X-ray interaction with molecules. While usual non-resonant scattering techniques have difficulty for distinguishing organic materials in a sample because they all have very similar electron densities, due to chemical sensitivity, RSoXS can increase the contrast between these materials orders of magnitude.
RSoXS and STXM techniques can address scientific cases like: organic electronics, liquid crystals, polyelectrolyte solutions and gels, membranes and porous materials, self direct assembly, polymers, nanocomposites, interfacial structures, low Z catalysis, biology, etc. Some examples will be pointed out.

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