

# Soft Matter and Small-angle neutron scattering

A. Williams<sup>1</sup>

<sup>1</sup>*Paul Scherrer Institut, Villigen PSI, Switzerland*

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Small-angle neutron scattering (SANS) is a unique tool able to probe the nanostructure of materials from a few to several thousand angstroms. In particular, neutron scattering has the ability to resolve the structure of materials due to contrast from different atoms and regions, and also can exploit contrast matching to highlight or hide different components in the system. For soft matter, much of the contrast comes from hydrogen, and contrast matching is routinely done by deuteration.

Through scattering off of nanoparticles, micelles, polymers, emulsions, *etc.* we are able to determine their shape (form factor) as well as any ordering from charge or concentration (structure factor). We can also implement complex *in-situ* sample environments, to determine nanostructural changes under stimuli.

I will give a brief introduction to SANS, and the world of soft matter. I will then highlight some examples of form and structure factor determination, contrast matching, as well as some *in-situ* measurements, where we look at materials under flow, and on mixing.