

## Online Advanced Course on Neutrons as Probes of Condensed Matter

Questions for SANS part:

1. What are the length scale of interest and Q-range used in SANS experiments? How structure, interaction and composition can be determined by SANS?
2. Derive the expression for form factor of a spherical particle. What is the value of Q for the first minimum of the form factor?
3. Plot a curve of scattering intensity as function of sample thickness. What are criteria used for the determination of sample thickness in a SANS experiment?
4. Calculate the neutron scattering length density of PEO polymer and Fe<sub>3</sub>O<sub>4</sub> nanoparticles. What will be the choice of solvent (H<sub>2</sub>O or D<sub>2</sub>O) for measuring them in a SANS experiment?
5. What are advantages of using SANS as compared to other complementary techniques? How contrast variation in SANS can be utilized for biological systems?