An Introduction to SAXS and SANS

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Small-angle scattering of X-rays (SAXS) and neutrons (SANS) are powerful methods for nanostructure analysis with closely related, basic physical concepts and strong complementarities. The talk will first introduce the basic scattering theory and outline the conceptual approaches to the application for (a) dilute particle systems, (b) crowded particle systems, (c) porous or condensed heterophase systems, (d) low-dimensional ordered systems and liquid crystals, and (e) thin solid films (GISAXS) . In the second part, the talk will describe the complementary strengths and weaknesses of SAXS and SANS, respectively, with some representative examples from material research and biophysics. Finally, the pertinent principles of instrumentation: sources, optics, sample environment, detectors, and data analysis will be described.

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