A winter school on small angle neutron scattering (SANS) data analysis will be held at ORNL from January 9th to 13th 2023.

The primary objective of this school is to provide a tutorial for students to learn a data analysis fundamental for quantitative structural analysis from SANS data. The emphasis will be placed on a quantitative understanding of SANS based on quantum and statistical mechanic rather than being a tutorial for typical software tools. Students will have opportunities to use the understandings and methods taught in the lectures to analyze real experimental data from well-defined model systems. Topics covered include:

* heuristic introduction of scattering cross section
* derivation of scattering cross section through partial wave expansion & Fermi approximation
* mathematical properties of scattering cross section
* principle of contrast variation
* scattering from non-interacting systems
* scattering from interacting systems – analytical methods and machine learning approaches

The discussion of data analysis will be most relevant to a variety of selected topics for structural studies of soft materials.