

# Magnetic Neutron Diffraction

Vladimir Pomjakushin

*Laboratory for Neutron Scattering and Imaging LNS, Paul Scherrer Institut, CH-5232  
Villigen PSI, Switzerland*

First, in the lecture, the basic principles of magnetic neutron diffraction will be given, such as the details of neutron-electron interaction Hamiltonian, scattering Q-operator and its properties. Further I will give an overview of magnetic order parameters, and consider the (electro)magnetic multipoles to which neutrons are sensitive. In the second part of the lecture I will present the modern way of description, classification and determination of magnetic structure, such as Shubnikov (or Magnetic) space groups, 3D+n superspace groups and propagation vector irreducible representation (irrep) approach with several real experimental case studies.

The plan of the lecture can be found under this [link](#). The pdf-file with this talk will be available [here](#) after the [school](#).