Contribution ID: **111** Type: **Talk**

Magnetic order in the Cs2CuCl4-xBrx mixed system

Tuesday 18 September 2018 11:15 (15 minutes)

Cs_2CuCl_4 and Cs_2CuBr_4 are anisotropic triangular lattice materials, where Cu^{2+} ions with S=1/2 form frustrated 2D planes [1,2]. The mixed system $Cs_2CuCl_{4-x}Br_x$ is used to study the effect of controlled-quenched disorder in the spin superstructure lattice. Preferential occupation of Cl/Br leads to selective disorder in the lattice and some well-ordered structures. The neutron diffraction investigation of the magnetic phase diagram of $Cs_2CuCl_{4-x}Br_x$ provides detailed information about the influence of a specific Br concentration on the magnetic structure and help to clarify, how small modifications of the local Cu^{2+} environment influence the exchange couplings and frustration in these compounds. Two different long-range ordered magnetic phases are found in this mixed system, and the first overview of the low-temperature magnetic phases of $Cs_2CuCl_{4-x}Br_x$ will be presented. The density functional theory (DFT) calculations show values of exchange coupling constants J, J' for some ordered compositions of this mixed system. Furthermore, we start also studies in a magnetic field, because the quantum critical points are exciting, which may be also studied in the presence of disorder and potential spin-liquid phases in this mixed system.

[1] R. Coldea et al. J. Phys.: Condens Matter 1996, 8, 7473-7491
[2] T. Ono et al. J. Phys. Soc. Jpn. 2005, 74, 135

Author: VAN WELL, Natalija (Laboratory of Crystallography, University of Bayreuth, Universitaetsstrasse 30, D-95440 Bayreuth)

Co-authors: Dr ZAHARKO, Oksana (Laboratory for Neutron Scattering and Imaging, Paul Scherrer Institute); Dr DELLEY, Bernard (Condensed Matter Theory Group, Paul Scherrer Institute); Dr SKOULATOS, Markos (Heinz Maier-Leibnitz Zentrum (MLZ), Technische Universität München); Dr GEORGII, Robert (Heinz Maier-Leibnitz Zentrum (MLZ), Technische Universität München); Prof. VAN SMAALEN, Sander (Laboratory of Crystallography, University of Bayreuth); Prof. RÜEGG, Christian (Research with Neutrons and Muons)

Presenter: VAN WELL, Natalija (Laboratory of Crystallography, University of Bayreuth, Universitaetsstrasse 30, D-95440 Bayreuth)

Session Classification: Parallel session 4

Track Classification: P4 Magnetism and quantum phenomena