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Spin liquids and spin dynamics in kagome antiferromagnets

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Among all the corner sharing highly frustrated magnets, only a few experimental systems are good candidates for a low-T fluctuating state, ie fulfilling the important conditions of the pure Heisenberg lattice with nn couplings. The combination of the weakness of the single-ion anisotropy and of a direct overlap antiferromagnetic exchange are certainly the major advantages of the chromate S=3/2 kagome bilayer $Ba_2Sn_2ZnGa_{10-7p}Cr_{7p}O_{22}$- BSZCGO(p)- and the long studied $SrCr_{9p}Ga_{12-9p}O_{19}$ - SCGO(p). Beyond the absence of ordering well below the Curie-Weiss temperature, the unusual large value of the specific heat unveils a high density of low lying excitations and its field independence suggests that the excited states are mostly singlets. Moreover, their ground state is found essentially fluctuating although an intrinsic spin glass (SG) signature is observed in susceptibility measurements. Through a review of our past years work, I'll illustrate all the potential of local studies (NMR and μSR) to reveal some key aspects of the physics of these compounds: susceptibility, fluctuations, impact of dilution defects which generate an extended response of the spin-lattice ... as well as the puzzling spin-glass state. More recently we also investigated new series of compounds, among them volborthite and delafossites which feature S=1/2 spins on a corner sharing antiferromagnetic lattice. I'll introduce these compounds and shortly discuss their relation to ideal Hamiltonians and novel features. - *D. Bono et al.Phys. Rev. Lett. 93, 187201 (2004), 92, 217202 (2004) ; Cond-mat/0503496. F. Bert et al. Phys. Rev. Lett., 95, 087203 (2005). L. Limot, et al., Phys. Rev. B, 65, 132403 (2002). P. Mendels et al. Phys. Rev. Lett., 85, 3496 (2000).*