Quantum Kagome Antiferromagnets : Local NMR and μSR Experiments

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The frustration of antiferromagnetic interactions on the loosely connected kagome lattice associated to the enhancement of quantum fluctuations for $S = 1/2$ spins was acknowledged long ago as a key combination to stabilize novel ground states of magnetic matter such as spin-liquids. Only in 2005, a model compound, the Herbertsmithite $ZnCu_3(OH)_6Cl_2$, could be synthesized and has triggered since then a remarkable activity [1]. There are now a few new candidate materials, among which Kapellasite and Haydeeite [2], Mg analogues of Herbertsmithite [3], and Vesignieite [4]. I will present a selection of the properties uncovered by our recent NMR and μSR experiments in these systems and will tentatively classify them with respect to the most studied case of Herbertsmithite. I will discuss the role played by Dzyaloshinskii-Moriya interactions. More generally, the question of the criticality and stability of the kagome Heisenberg model is addressed on the basis of recent results in Herbertsmithite.

[1] *For a review, see P. Mendels and F.Bert, J. Phys. Soc. Jpn 1, 011001 (2010).* [2] *R.H. Colman et al. Chem. Mat. (2010).* [3] *S. Chu et al., J. Am. Chem. Soc. (2010). R.H. Colman et al. Chem. Mat. (2011).* [4] *Y. Okamotoet al., J. Phys. Soc. Jpn (2009). R. Colman et al., Phys. Rev. B (2011).*

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