



**Conference on Many-Body-Localization:
Advances in the Theory and Experimental Progress
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Probing and Controlling Localization in Disordered Quantum Magnets

In the first part of the talk, I will discuss a simple probe of many-body localization in quantum magnets, namely the out-of-equilibrium remanent magnetization that persist after ferromagnetically polarizing an antiferromagnetic chain, whose total magnetization is not conserved. After briefly recalling how conserved quantities can be constructed perturbatively in the localized phase, I will exploit them to compute the long-time limit of the remanent magnetization in the strong-disorder regime. In the second part of the talk, I will discuss several mechanisms by which thermal fluctuations may influence the spatial localization of excitations, focusing on interacting, frustrated spin systems on graphs with high-connectivity.
