

## NMR in Quantum Spin Systems

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This lecture will begin by a brief description the overwhelming rich physics met in various quantum spins systems, starting from the well-known Heisenberg antiferromagnetic spin-1/2 chain up to the most recent developments. We shall then discuss the essential contributions that NMR can bring to that field, as compared to other techniques like EPR, and neutron scattering.

In a second part, we shall illustrate the power of NMR on a variety of different quantum spin systems: - quasi-1D systems, including spin-Peierls systems, frustrated  $J_1 - J_2$  spin chains, spin-ladders, etc. - quasi-2D systems which display the rich physics of hardcore bosons on a lattice, with the possibilities of Bose-Einstein Condensation, supersolid phases, Wigner crystallization. The role of the magnetic field as a physical variable unravelling new quantum ground states will be particularly emphasized, as well as the possibilities offered by the use of very high magnetic fields obtained by using resistive magnets.