**Magnetic nanomaterials with remarkable properties**

**studied by advanced x-ray spectroscopies**

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X-ray spectroscopies performed at synchrotron light sources, such as X-ray Absorption Spectroscopy and Resonant Inelastic X-ray Scattering are powerful tools to study complex materials, due to their chemical selectivity that allows disentangling the respective contributions of different atomic species. In this talk, I will show how the use of incident polarized x-rays (either linear or circular) can allow a deeper understanding of the electronic structure and reveal emergent properties, with a focus on remarkable magnetic nanomaterials: Single Molecule Magnets, bimagnetic nanoparticles, ferrofluids, ultra-thin nanowires. Moreover, I will illustrate how the combination of these spectroscopies with x-ray microscopy can provide valuable information with nanoscale spatial resolution, exemplified by recent results obtained on magnetotactic organisms.