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Xenon is a powerful NMR probe for several reasons. Despite a slightly hydrophobic character, this non-toxic species is soluble in most biological media, and its physical properties make that it can be easily handled. But the most interesting feature lies in the great deformability of its electronic cloud, which leads to a large modularity of its NMR properties according to its close environment. ^{129}Xe nuclear spin can be quickly hyperpolarized via optical pumping. Thus, ^{129}Xe NMR combines a high detection sensitivity and a high selectivity due to this spectral discrimination ability.
In particular, in the field of life science, xenon can be vectorized toward biological targets of interest by using functionalized molecular hosts, which enables their detection at nanomolar concentrations. In association with a new generation of detection methods, this gives rise to a powerful molecular imaging approach, whereby xenon can be delivered and detected systematically several times after the introduction of a functionalized host system.
My talk will give an overview of some facets of this approach both for in vitro and in vivo studies.

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Head of the LSDRM lab (‘Structure et Dynamique par Résonance Magnétique’), which belong to the Unit NIMBE (‘Nanoscience & Innovation for Materials’)
Several contributions in the field of NMR/MRI methodology and instrumentation.
Since 1997, he has been focusing on spin-hyperpolarization, principally producing and using laser-polarized noble gases (more than 50 publications). Also his interest lies in parahydrogen-induced polarization.