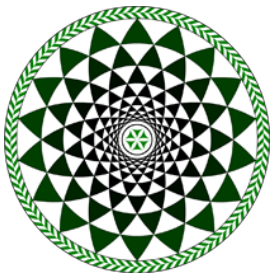

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Investigation of structural and dynamic properties on wide space- and time-scales by solid state NMR spectroscopy

Thursday, July 9, 2015 10:10 AM (30 minutes)

Solid state Nuclear Magnetic Resonance Spectroscopy is able to give detailed bulk structural and dynamic information on solid systems and soft matter, representing one of the most powerful characterization techniques in several fields, ranging from pharmaceuticals to polymeric materials, from inorganic compound to hybrids, from liquid crystals to biological systems.
Structural information cover a space range from 0.1 to about 100 nm, and it concern bondings, conformations, intra- and inter-molecular interactions, supra-molecular spatial arrangements, molecular organization in crystalline and amorphous phases, interphases and interfaces, disposition of different domains in heterophasic systems.
Furthermore, concerning molecular dynamics, solid state NMR allows one to characterize, in a very detailed and quantitative way, rotational and inter-conformational motions with characteristic correlation times ranging from seconds to picoseconds.
In this lecture, these features will be discussed mostly resorting to examples on different classes of systems: polymers, small organic molecules, organic-inorganic hybrids, liquid crystals, phospholipid bilayers, etc.
Similarities and differences between solid state NMR and other spectroscopic and non-spectroscopic techniques used to obtain analogous and/or complementary information, such as DSC, electronic microscopies, X-ray diffraction, dielectric spectroscopy, will be critically discussed and analyzed.

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