

Séminaire Physico-chimie & Biologie

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Bât. 563 - salle 15

Soft Matter in Hard Confinement: Thermodynamics, Microscopic Structure, Diffusion and Flow in Nanoporous Media

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Abstract:

Spatial confinement in nanoporous media affects the structure, thermodynamics and mobility of molecular soft matter often markedly. In my talk I will present experimental studies on thermodynamic equilibrium phenomena, such as capillary condensation, crystallisation, self-diffusion, and structural phase transitions as well as selected aspects of the emerging field of spatially confined, non-equilibrium physics, i.e. the rheology of liquids, capillarity-driven flow phenomena, and imbibition front broadening in nanoporous materials. The observations in the nanoscale systems are related to the corresponding bulk phenomenologies. The complexity of the confined molecular species is varied from simple building blocks, like normal alkanes and alcohols to liquid crystals, polymers, electrolytes and water. In general our experimental studies document that modern X-ray and neutron scattering techniques along with the availability of tailorable porous solids allow a rigorous exploration of spatially confined condensed matter.