

Séminaire

Mardi 24 mars 2026 à 10h30  
Amphithéâtre Henri Benoît

**Rik Wensink**

Laboratoire de Physique des Solides  
CNRS & Université Paris-Saclay, Orsay, France

# Order, Fluidity and Symmetry Breaking in Hybrid Liquid Crystals

Intriguing new forms of nanoparticle self-assembly can be explored when thin non-spherical colloidal particles such as rods and discs interact with a thermotropic liquid crystalline solvent. In addition to the intrinsic orientation-dependence of the nanoparticle interactions, the correlations between the immersed colloids are further enriched by so-called surface anchoring and, to a far lesser extent in view of their vanishing internal volume, by nematic forces. At crowded conditions, these forces conspire with orientation-dependent intercolloidal repulsions to form so-called hybrid nematic liquid crystals with point-group symmetries ranging from orthorhombic [1] to monoclinic [2]. Another level of complexity can be achieved by considering chiral molecular host phases with some long-ranged periodicity imposed by their helical mesostructure [3]. In this talk I will give an overview of experiments and modelling studies exploring reconfigurable liquid crystal order, unusual phase behaviour and spontaneous biaxial orientational symmetry breaking that naturally occur in these complex liquid crystal materials.

[1] H. Mudoor, S. Park, B. Senyuk, H. H. Wensink and I. I. Smalyukh, Hybrid molecular-colloidal liquid crystals. *Science* **360**, 768 (2018);

[2] H. Mudoor, J.-S. Wu, H. H. Wensink and I. I. Smalyukh, Thermally reconfigurable monoclinic nematic colloidal fluids. *Nature* **590**, 268 (2021).

[3] J.-S. Wu, M. Torres Lázaro, H. Mudoor, H. H. Wensink and I. I. Smalyukh, Emergent biaxiality in chiral hybrid liquid crystals, *Nat. Commun* **15**, 9941 (2024).

Les personnes souhaitant rencontrer l'orateur sont priées de prendre contact avec William Fall.