Prénom, nom du représentant de l'équipe : Emmanuelle Lacaze

Nom et adresse du laboratoire : Institut des Nano-Sciences de Paris (INSP), 4 place Jussieu 75005 Paris

Site web du laboratoire : http://www.insp.upmc.fr/

Site web de l'équipe (si existant) : http://www.insp.upmc.fr/-Physico-chimie-et-dynamique-des,20-.html

Mot-clés (5 maximum) :
Gold Nanoparticles, Fluorescent Nanoparticles, liquid cristals, topological defects, X-ray diffraction

Paragraphe de présentation des thématiques (10 lignes maximum) :

We use dedicated liquid crystal topological defects to confine nanoparticles in 1 Dimension (using liquid crystal smectic dislocations) or in 2 Dimensions (using ribbon-like liquid crystal smectic grain boundaries). Nanoparticles self-organize and build new kinds of close-packed networks. Combining Polarized Optical Microscopy, Fluorescence Microscopy, UV-Visible Spectrophotometry and synchrotron GISAXS, we have shown that the confined nanoparticles sequentially self-organize in chains, then in ribbon-like 2D networks (hexagonal networks for nanospheres), the proportion of both types being driven by nanoparticle concentration. Both types of nanoparticle organizations are strictly oriented by the liquid crystal topological defects

5 publications récentes :

1. Habib Ayeb, Mouna Derbali, Ahmed Mouhli, Taoufik Soltani, Fathi Jomni, J´erˆome Fresnais and Emmanuelle Lacaze, "Viscoelastic and dielectric properties of 5CB nematic liquid crystal doped by magnetic and nonmagnetic nanoparticles". *Phys. Rev. E* **2020** 102, 052703.

2. Syou-P'heng Do, Amine Missaoui, Alessandro Coati, Andrea Resta, Nicolas Goubet, S´ebastien Royer, Geraldine Guida, Emrick Briand, Emmanuel Lhuillier, Yves Garreau, David Babonneau, Michel Goldmann, Doru Constantin, Bruno Gallas, Bernard Croset and Emmanuelle Lacaze,
"Interactions Between Topological Defects and Nanoparticles" *Front. Phys.* **2020** 7, 234.

3., Syou- P'heng Do, Amine Missaoui, Alessandro Coati, Delphine Coursault, Haifa Jeridi, Andrea Resta, Nicolas Goubet, Michal M. Wojcik, Arnaud Choux, S´ebastien Royer, Emrick Briand, Bertrand Donnio, Jean Louis Gallani, Brigitte Pansu, Emmanuel Lhuillier, Yves Garreau, David Babonneau, Michel Goldmann, Doru Constantin, Bernard Croset, Bruno Gallas and Emmanuelle Lacaze,
"From Chains to Monolayers : Nanoparticle Assembly Driven by Smectic Topological Defects" *Nano Letters* **2020** 20, 1598.

4. B. Zappone, A. Eren Mamuk, I. Gryn, V. Arima, A. Zizzari, R. Bartolino, E. Lacaze and Rolfe Petschek.
"Analogy between periodic patterns in thin smectic liquid crystal films and the intermediate state of superconductors", *PNAS* **2020**, 117, 17643.

5. Brigita Rozic, J´erˆome Fresnais, Celine Molinaro, Joseph Calixte, Shivakumar Umadevi, Stephanie Lau-Truong, Nordin Felidj, Tobias Kraus, Fabrice Charra, Vincent Dupuis ,Torsten Heg- mann, Celine Fiorini-Debuisschert ,Bruno Gallas and Emmanuelle Lacaze
"Oriented Gold Nanorods and Gold Nanorod Chains within Smectic Liquid Crystal Topological Defects",, *ACS Nano* **2017** 11, 6728.