

## Optical manipulation of nematic colloids: wires, superstructures and 2D crystals

I. Muševič

J. Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia

Faculty of Mathematics and Physics, University of Ljubljana, Jadranska 19, 1000 Ljubljana, Slovenia

Optical manipulation of colloidal particles in the nematic liquid crystals is far more complex compared to the manipulation in water based colloids. Due to the long range nature of the orientational ordering of liquid crystals, their elasticity and topological conservation laws, almost any kind of object can be trapped and manipulated in liquid crystals. Furthermore, local heating due to the absorption of light can be used to create microdroplets of the isotropic phase, which interact strongly with colloidal particles. This leads to a broad variety of colloidal assemblies in liquid crystals, which cannot be observed in isotropic solvents: colloidal wires, assembled by entangled topological defects, superstructures in the mixtures of large and small colloidal particles and a broad variety of 2D nematic colloidal crystals. In all cases, the colloidal binding energy is several orders of magnitude stronger compared to water based colloids.

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