

Broken mirror symmetry in nematic colloids: Chiral dimers and 2D crystals

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We show that macroscopic chiral organization of the underlying complex fluids strongly influences colloidal interactions. It not only lifts the energy degeneration of recently observed “bubble-gum” colloidal dimers in non-chiral liquid crystal, but also dramatically increases the probability of their formation. We identify experimentally and numerically two basic colloidal dimer conformations in a nematic liquid crystal, that are of opposite chirality and we confirm the non-singular topological nature of their binding. Dimer-dimer interaction weakly depends on the chirality of dimers and leads to an assembly of 2D nematic colloidal crystals of pure or mixed chirality.

References

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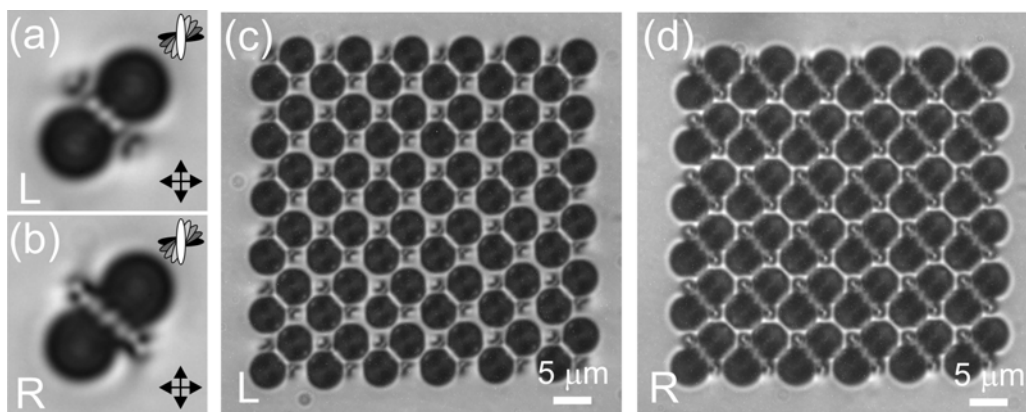


Figure: Two colloidal dimers (a,b) and 2D colloidal crystals (c,d) of different chirality in a 90° right-twisted nematic cell.