

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Liquid Crystal Phase Transitions and Defects to Sort and Soft-Assemble Microstructures¹ ANDREA RODARTE, L.S. HIRST, S. GHOSH, University of California, Merced — The isotropic phase transition of thermotropic nematic liquid crystal (LC) doped with low concentrations of quantum dots (QDs) has previously been used to create ordered clusters of QDs centered at the LC defect points [1]. This process can be exploited to create ordered columns of QD clusters using a micropillar template. In addition, the capping agents on the QDs can be modified to liquid crystal like mesogenic ligands, allowing for better dispersion in the LC host material. At high concentrations of these LC-QDs, we observe a fluid-fluid phase separation in which the functionalized QDs create nematic droplets when dispersed in 4'-Pentyl-4-biphenylcarbonitrile (5CB). Defects and phase separation may be used to sort nanoparticles and create dynamic microstructured assemblies, taking one step closer to soft assembled metamaterials.

[1] A. L. Rodarte, R. J. Pandolfi, S. Ghosh and L. S. Hirst, *J. Mat. Chem. C*, 1, 5527, 2013.

¹This work was funded by UC President's Dissertation Year Fellowship

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Date submitted: 15 Nov 2013

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