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Nanoparticle Self-Assembly in the Cholesteric Liquid Crystal Blue Phase[1] DENNIS GARDNER, BETHANY WILCOX, IVAN SMALYUKH, University of Colorado at Boulder, LIQUID CRYSTALS MATERIALS RESEARCH CENTER TEAM — We study the spatial self-assembly and self-alignment of CdSe quantum dots and rods in liquid crystal (LC) suspensions. Employing the strong non-bleaching fluorescent signals from these nanoparticles, we use fluorescent confocal microscopy to image the 3-D spatial location of the nanoparticles. We demonstrate that LC defects and structures allow for controlled localization, alignment, and assembly of these nanoparticles. Generalizing our studies for various nanoparticles of different compositions may provide new self-assembly-based methods of nanofabrication of metamaterials needed for applications such as cloaking at optical wavelengths, optical circuits, and super lenses.

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