Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Novel confinement of liquid crystals in Janus droplets**[1] WEI-SHAO WEI, JOONWOO JEONG, University of Pennsylvania, Department of Physics and Astronomy, PETER J. COLLINGS, Swarthmore College, Department of Physics and Astronomy, TOM C. LUBENSKY, A. G. YODH, University of Pennsylvania, Department of Physics and Astronomy — In this work we create and investigate Janus droplets composed of liquid crystal (LC) and polymer. The Janus droplets are formed when homogeneous droplets of LC-polymer-solvent phase separate into LC and polymer regions during solvent evaporation through aqueous continuous phase. This scheme enables us to realize unique confinement geometries for LCs such as spherical caps and bowls, which are difficult to be achieved via other systems. The morphologies and surface anchoring conditions can be controlled by changing the size of droplets, the volume ratio between LC and polymer, and the type/concentration of surfactants in aqueous background phase. We explore a variety of defects in these novel confined geometries including dislocations and focal conic defects of smectic LCs. Nematic and cholesteric LCs are also explored. Models that balance the energetics of bulk elasticity and surface anchoring determine the director configurations of confined liquid crystals (LCs).

[1]This work is funded by NSF Grant DMR-1205463, NSF MRSEC Grant DMR-1120901, and NASA Grant NNX08AO0G.

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Date submitted: 13 Nov 2014 Electronic form version 1.4