Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Directed Self-assembly of Colloidal Particles on a Blue Phase I Interface[1] JOSE MARTINEZ-GONZALEZ, YE ZHOU, MONIROSADAT SADATI, Univ of Chicago, NICHOLAS ABBOTT, University of Wisconsin, JUAN DE PABLO, Univ of Chicago — Blue phases are liquid states of matter with a highly ordered defect structure which confers unique properties among complex fluids. In this work, a free energy model of chiral liquid crystals is used to consider the self-assembly of colloids and nanoparticles on the interface of a Blue Phase I. It is shown that the crystalline defect structure of the blue phase produces intricate, two-dimensional hexagonal and Kagome structures among the nanoparticle arrangements, with lattice parameters that depend on the type of anchoring of the liquid crystal at the particles surface. These parameters can be tuned via the chirality of the material, thereby offering intriguing possibilities for the creation of hierarchical materials based on the directed assembly of particles in chiral liquid crystals.

[1]This work is supported by the Department of Energy, Basic Energy Sciences, Materials Science and Engineering Division, Biomaterials Program, through DE-SC004025.

Jose Martinez-Gonzalez
Univ of Chicago

Date submitted: 06 Nov 2015 Electronic form version 1.4