Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

DNA Origami Patterned Colloids for Programmed Design and Chirality[1] MATAN YAH BEN ZION, XIAOJIN HE, CORINNA MAASS, Center for Soft Matter Research, Department of Physics, New York University, RUOJIE SHA, NED SEEMAN, Department of Chemistry, New York University, PAUL CHAIKIN, Center for Soft Matter Research, Department of Physics, New York University — Micron size colloidal particles are scientifically important as model systems for equilibrium and active systems in physics, chemistry and biology and for technologies ranging from catalysis to photonics. The past decade has seen development of new particles with directional patches, lock and key reactions and specific recognition that guide assembly of structures such as complex crystalline arrays. What remains lacking is the ability to self-assemble structures of arbitrary shape with specific chirality, placement and orientation of neighbors. Here we demonstrate the adaptation of DNA origami nanotechnology to the micron colloidal scale with designed control of neighbor type, placement and dihedral angle. We use DNA origami belts with programmed flexibility, and functionality to pattern colloidal surfaces and bind particles to specific sites at specific angles and make uniquely right handed or left handed structures. The hybrid DNA origami colloid technology should allow the synthesis of designed functional structural and active materials.

[1]This work was supported as part of the Center for Bio-Inspired Energy Science, an Energy Frontier Research Center funded by the U.S. Department of Energy, Office of Science, Basic Energy Sciences under Award # DE-SC0000989

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Date submitted: 13 Apr 2017 Electronic form version 1.4