Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Lock and Key Colloids through Polymerization-Induced Buckling of Monodispersed Silicon Oil Droplets[1] STEFANO SACANNA, WILLIAM T.M. IRVINE, PAUL M. CHAIKIN, DAVID J. PINE, NYU — Colloidal particles can spontaneously associate into larger structured aggregates when driven by selective and directional interactions. Colloidal organization can be programmed by engineering shapes and interactions of basic building blocks in a manner similar to molecular self-assembly. Examples of successful strategies that allow non-trivial assembly of particles include template-directed patterning, capillary forces and, most commonly, the functionalization of the particle surfaces with "sticky patches" of biological or synthetic molecules. The level of complexity of the realizable assemblies, increases when particles with well defined shape anisotropies are used. In particular depletion forces and specific surface treatments in combination with non spherical particles have proven to be powerful tools to self-assembly complex microstructures. We describe a simple, high yield, synthetic pathway to fabricate monodisperse hybrid silica spheres with well defined cavities. Because the particle morphologies are reproducible and tunable with precision, the resulting particles can be used as basic building blocks in the assembly of larger monodisperse clusters. This is demonstrated using depletion to drive the self-assembly.

[1]S. Sacanna was supported by the Netherlands Organization for Scientific Research (NWO) through a Rubicon fellowship.

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Date submitted: 16 Dec 2009 Electronic form version 1.4