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Self assembly of anisotropic colloidal particles DANIEL FLOREA, HANS WYSS, Eindhoven Technical University — Colloidal particles have been successfully used as "model atoms", as their behavior can be more directly studied than that of atoms or molecules by direct imaging in a confocal microscope. Most studies have focussed on spherical particles with isotropic interactions. However, a range of interesting materials such as many supramolecular polymers or biopolymers exhibit highly directional interactions. To capture their behavior in colloidal model systems, particles with anisotropic interactions are clearly required. Here we use a colloidal system of nonspherical colloids, where highly directional interactions can be induced via depletion. By biaxially stretching spherical PMMA particles we create oblate spheroidal particles. We induce attractive interactions between these particles by adding a non-adsorbing polymer to the background liquid. The resulting depletion interaction is stronger along the minor axis of the oblate spheroids. We study the phase behavior of these materials as a function of the ellipsoid aspect ratio, the strength of the depletion interactions, and the particle concentration. The resulting morphologies are qualitatively different from those observed with spherical particles. This can be exploited for creating new materials with tailored structures.

Daniel Florea
Eindhoven Technical University

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