# Self-assembly of colloidal particles at liquid interfaces

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## ABSTRACT

Colloidal particles are known to be very efficient stabilizers for fluid interfaces with applications in the food and cosmetics industry, enhanced oil recovery, drug delivery or waste water management. Capillary interactions between particles with different shape, contact angle on the particle surface, or particle-particle interactions are also promising candidates to self-assemble complex structures for the production of new soft materials or applications in the printing and coating industries. We present computer simulations based on a hybrid lattice Boltzmann and molecular dynamics method [1] and demonstrate the impact of the particle shape and its wettability on the detachment energy of a colloidal particle [2] and demonstrate new ways to self-assemble complex structures by means of capillary interactions and external magnetic fields to steer the movement of ellipsoidal particles [3,4]. Furthermore, we introduce spherical magnetic Janus particles with a hydrophobic and a hydrophilic side and demonstrate that their capillary interactions can be tuned by a well-controlled external magnetic field [5,6]. We close with an outlook on ongoing research on soft particles at fluid interfaces [7] and magnetically actuated microswimmers

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