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Dynamics and morphology of rigid and deformable shells in a nematic liquid crystal ARTHUR EVANS, MICHAEL GRAHAM, SAVERIO SPAGNOLIE, Univ of Wisconsin, Madison — When immersed in a nematic liquid crystal, colloids force topological defects to nucleate in the bulk director field. These defects, and the interactions between particles, are known to lead to assembly of complex structures. Much less is known regarding the dynamics of colloidal particles, and the effects of particle elasticity on assembly and interaction properties. In this talk I will present an immersed boundary method that models fully three-dimensional hydrodynamics of particles in a nematic liquid crystal, for both rigid body motion and deformable shells. For rigid body motion, viscous anisotropy, coupled with the dynamic interactions that occur in the case of strong anchoring or high Ericksen number, yield results for the linear and nonlinear microrheology of colloids. Additionally, soft membranes such as vesicles or polymerosomes may be deformed by the strong anchoring of liquid crystals; in this case, the defect structure affects long range interactions between soft particles, and also the final morphology of the membranes themselves.

Arthur Evans
Univ of Wisconsin, Madison

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