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Dynamics and morphology of flexible membranes in a nematic liquid crystal ARTHUR EVANS, MICHAEL GRAHAM, SAVERIO SPAGNOLIE, Univ of Wisconsin, Madison — Cellular membranes and nanoscale capsules inhabit highly viscous environments, and their overall dynamics and morphology depend on the fluid in which they are immersed. While some fluids of interest are purely Newtonian, biologically and industrially relevant materials often involve complex molecular constituents that imbue the surroundings with anisotropy or viscoelasticity. Moreover, fluid stresses are often comparable to the elastic resistance of immersed membranes or capsules, so that these structures deform in response to flow and order in the fluid. In this talk I will present a numerical implementation for examining immersed elastic bodies in a flowing liquid crystal, and discuss the implications for biological materials and self-assembly of soft structures. Even in the case of zero flow for rigid particles, the presence of topological defects in nematics leads to intriguing inter-particle interactions. For flexible membranes, the liquid crystal defect structure not only affects long-range interactions, but ultimately the morphology of the membranes themselves.

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