Frustrated nematic order in spherical geometries

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When nematic liquid crystals are confined between spheres to form shells, complex defect structures emerge. These structures are characterized by a varying number of point defects and disclination lines, all complying with the topological constraints imposed by the spherical geometry. Interestingly, even if the shell thickness per se is what brings about shells with different number and type of defects, it is the thickness inhomogeneity what determines the actual defect arrangement[1]. We will present the rich phenomenology we observe in our shells, where defects move continuously and/or discontinuously as a function of thickness inhomogeneity. In addition, we will also briefly discuss our recent approach to the generation of non-spherical surfaces, such as a torus[2], which we hope to use in the near future to address frustration in these closed surfaces.

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[2] E. Pairam, A. Fernandez-Nieves, Phys. Rev. Lett. **102**, 234501 (2009)