

Orientational order on curved flexible substrates

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Fluid membranes endowed with tangent-plane order (TPO) such as tilt— and hexatic order afford unique soft matter systems for investigating the interplay between elasticity, shape, topology, and thermal fluctuations. Using the spin-connection formulation of membrane energy we obtain equations of equilibrium together with free boundary conditions for ground states of such membranes. We extend the spin-connection formulation to smectic liquid crystals with TPO and show that for chiral smectics- C^* this generalization leads to experimentally verifiable consequences for dispirations having topological indices (helicities) of the same magnitude but opposite signs.

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