

## **Exotic Defects in Confined Nematic Systems**

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Nematic liquid crystals are classical examples of partially ordered materials. We study nematic equilibria on regular polygons, with non-trivial tangent boundary conditions, in the powerful Landau-de Gennes framework. We study two asymptotic limits, relevant for small nano-scale domains and macroscopic domains respectively. In the small domain limit, we always have an isolated degree +1 vortex at the polygon centre, which splits into fractional defects, as the domain size increases. We also discuss parallel results on ferronematics, with nematic and magnetic order. We numerically observe stable interior point defects and magnetic domain walls, without any external fields, for these coupled systems.