

# The evolution equation for a disclination in a nematic liquid crystal

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We extend the Ericksen–Leslie theory for nematic fluids to account for the presence of disclinations. We obtain an evolution equation in which the resultant of the Eshelby stress at a disclination is proportional to the velocity of the disclination with respect to the material. Included among our results is a resolution of Eshelby’s paradox concerning the nature of the force acting on a disclination. As an application, we show how surface disclinations can be described using within our framework, and how these defects act to curve the free surface of the fluid, in competition with surface tension, and, thus, to create cusps at the surface.

**Presented by Paolo Cermelli**