Helical nanofilaments and the high chirality limit of smectics-
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vania — Motivated by recent experiments on chirality in smectic systems of achiral
bent core molecules [1], I shall describe our recent work on the theory of chiral
smectic-A liquid crystals and argue that at sufficiently large chiralities the tradi-
tional twist grain boundary phase is augmented by a new texture [2]. This bulk
texture is characterized by an array of parallel, coherently rotating helical nanofil-
aments, which represent the local optimal configuration for chiral smectics, laced
together by a lattice of defects, in a fashion akin to the cholesteric blue phases. A
mean field analysis of the properties of this nanofilament phase shows good qualita-
tive agreement with the germaine features of the experiment, which can be improved
upon by including the layer curvature energy, as well as bringing up several subtle
aspects of the familiar analogy between smectics and superconductors. [1] L. E.