

Abstract Submitted
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Hydrodynamics of an Active Smectic TAPAN CHANDRA ADHYAPAK, SRIRAM RAMASWAMY, Indian Institute of Science, JOHN TONER, University of Oregon — We show that self-driven particles, in suspension or on a substrate, can support striped phases with long-range order in three dimensions and quasi-long-range order in two dimensions. This is in contrast to the situation for smectic phases at thermal equilibrium, which have the same spatial symmetry. We analyse the fluctuation properties of stable active smectics as well as the nature of characteristic instabilities that these systems can display. Our results apply to any active system that spontaneously develops layers, including apolar orientable cells, monolayers of rods either fluidized or shaken and, most significantly, the Rayleigh-Benard instability.

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