

Abstract Submitted
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Effective temperature and spontaneous collective motion of active matter¹ SHENSHEN WANG, University of California, San Diego, PETER WOLYNES, Rice University — Spontaneous directed motion, a hallmark of cell biology, is unusual in classical statistical physics. Here we study, using both numerical and analytical methods, organized motion in models of the cytoskeleton in which constituents are driven by energy-consuming motors. Although systems driven by small-step motors are described by an effective temperature and are thus quiescent, at higher order in step size, both homogeneous and inhomogeneous, flowing and oscillating behavior emerges. Motors that respond with a negative susceptibility to imposed forces lead to an apparent negative temperature system in which beautiful structures form resembling the asters seen in cell division.

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Shenshen Wang
University of California, San Diego

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