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**Robust ecological pattern formation induced by demographic noise** THOMAS BUTLER, NIGEL GOLDENFELD, University of Illinois at Urbana-Champaign — We demonstrate that demographic noise can induce persistent spatial pattern formation and temporal oscillations in the Levin-Segel predator-prey model for plankton-herbivore population dynamics. Although the model exhibits a Turing instability in mean field theory, demographic noise greatly enlarges the region of parameter space where pattern formation occurs. To distinguish between patterns generated by fluctuations and those present at the mean field level in real ecosystems, we calculate the power spectrum in the noise-driven case and predict the presence of fat tails not present in the mean field case. These results may account for the prevalence of large-scale ecological patterns, beyond that expected from traditional non-stochastic approaches.

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