Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Stochastic recruitment leads to symmetry breaking in foraging populations TOMMASO BIANCALANI, University of Illinois at Urbana-Champaign, LOUISE DYSON, ALAN MCKANE, University of Manchester — When an ant colony is faced with two identical equidistant food sources, the foraging ants are found to concentrate more on one source than the other. Analogous symmetry-breaking behaviours have been reported in various population systems, (such as queueing or stock market trading) suggesting the existence of a simple universal mechanism. Past studies have neglected the effect of demographic noise and required rather complicated models to qualitatively reproduce this behaviour. I will show how including the effects of demographic noise leads to a radically different conclusion. The symmetry-breaking arises solely due to the process of recruitment and ceases to occur for large population sizes. The latter fact provides a testable prediction for a real system.

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Date submitted: 14 Nov 2013 Electronic form version 1.4