Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Metastability and Anomalous Fixation in Evolutionary Games on Scale-Free Networks MICHAEL ASSAF, Hebrew University of Jerusalem, MAURO MOBILIA, University of Leeds — We study the influence of complex graphs on the metastability and fixation properties of a set of evolutionary processes. In the framework of evolutionary game theory, where the fitness and selection are frequency dependent and vary with the population composition, we analyze the dynamics of snowdrift games (characterized by a long-lived metastable coexistence state) on scale-free networks. Using an effective diffusion theory valid in the weak selection limit, we demonstrate how the scale-free structure affects the system's metastable state and leads to anomalous fixation. In particular, we analytically and numerically show that the probability and mean time to fixation are characterized by stretched-exponential behaviors with exponents depending on the network's degree distribution.

M. Assaf* and M. Mobilia*, PRL 109, 188701 (2012) (* - equal contribution)

Michael Assaf
Hebrew University of Jerusalem

Date submitted: 03 Dec 2012 Electronic form version 1.4