

Abstract Submitted
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Non-neutral theory of biodiversity: Bose-Einstein condensation in ecosystems GINESTRA BIANCONI, Northeastern University, Boston, MA, USA, LUCA FERRETTI, Facultat de Veterinari, Universitat Autònoma de Barcelona, Spain, SILVIO FRANZ, CNRS et Université de Paris-Sud, Orsay, France — We present a non-neutral stochastic model for the dynamics taking place in a meta-community ecosystems in presence of migration. The model provides a framework for describing the emergence of multiple ecological scenarios and behaves in two extreme limits either as the unified neutral theory of biodiversity or as the Bak-Sneppen model. Interestingly, the model shows a condensation phase transition where one species becomes the dominant one, the diversity in the ecosystems is strongly reduced and the ecosystem is non-stationary. This phase transition can be mapped to a Bose-Einstein condensation and extend the principle of competitive exclusion to open ecosystems. This framework might be relevant for the study of the impact of invasive species in native ecologies.

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