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Per Arne Rikvold* (prikvold@fsu.edu), Department of Physics, Florida State University, Tallahassee, FL 32306-4350, and **Elise Filotas, Lael Parrott** and **Martin Grant**. *Emergence of Spatial Community Structure in Biological Metacommunities*.

The role of space in determining species coexistence and community structure is well established. However, previous studies mainly focus on simple competition and predation systems, and the role of mutualistic interspecies interactions is not well understood. Here we use a spatially explicit metacommunity model, in which new species enter by a mutation process, to study the effect of fitness-dependent dispersal on the structure of communities with interactions comprising mutualism, competition, and exploitation [1,2]. We find that the diversity and interaction network undergo a nonequilibrium phase transition with increasing dispersal rate. Low dispersion rate favors spontaneous emergence of many dissimilar, strongly mutualistic and species-poor local communities. Due to the local dissimilarities, the global diversity is high. High dispersion rate promotes local biodiversity and supports similar, species-rich local communities with a wide range of interactions. The strong similarity between neighboring local communities leads to reduced global diversity.

[1]. E. Filotas, M. Grant, L. Parrott, P.A. Rikvold, J. Theor. Biol. **266**, 419 (2010).

[2]. E. Filotas, M. Grant, L. Parrott, P.A. Rikvold, Ecol. Modell. **221**, 885 (2010). (Received February 27, 2013)