

Ada Altieri : Exploring the complexity of large ecological communities through the lens of disordered systems

mercredi 15 novembre 2023 14:00 (1 heure)

Title: Exploring the complexity of large ecological communities through the lens of disordered systems

In this talk, I will discuss some timely questions in high-dimensional theoretical ecology by focusing on a fully connected Generalized Lotka-Volterra (GLV) model with random interactions between species and finite demographic noise. Leveraging techniques rooted in disordered systems, I will unveil a very rich and, eventually, hierarchical organization of the equilibria. I will thus relate the slowdown of correlation functions to properties akin to those of glassy systems in the low-temperature regime.

In the second part, I will present two extensions of the GLV model discussed thus far: i) by incorporating non-logistic growth functions that enable positive feedback mechanisms; ii) by introducing spatial dependence through a metacommunity model. In the latter, depending on the interplay between the dispersal rate and the strength of demographic fluctuations, new phase transitions can be pinpointed.