

Ecology in the Age of Randomness : How Random Matrix Theory Explains Species Coexistence

mercredi 21 mai 2025 10:45 (30 minutes)

We study the stability of large ecosystems by modeling species interactions with random matrices within the Lotka–Volterra framework. Since real interaction data are difficult and costly to collect, we adopt a probabilistic approach.

I will introduce key concepts from Random Matrix Theory to analyze the typical behaviour of ecological equilibria. Unlike classical spectral questions, our focus lies on a nonlinear property of the random matrix. To study it, we use Approximate Message Passing, a tool from high-dimensional statistics.

Orateur: GUEDDARI, Mohammed-Younes (LIGM)