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ENS Biophysics Seminar

Vendredi 10 Octobre 2025, 12 :00
LPENS, L378
Domaines : physics.bio-ph

Titre : *Patterns robust to Disorder in spatially-interacting Generalized Lotka-Volterra Ecosystems*

Orateur : **Fabián Aguirre López (Centre d'Economie de la Sorbonne)**

Résumé : *We introduce a spatially-extended ecosystem of Generalized Lotka-Volterra type, where species can diffuse and interactions are nonlocal. We compute the criterion for the loss of stability of the spatially homogeneous ecosystem, and we show that the stability of the uniform state crucially depends on the most abundant species, and on the interplay between space exploration during the time scale of reproduction and the interaction range. Focusing on the spectrum of the interaction matrix weighted by the species abundances, we identify a Baik-Ben Arous-Péché transition that translates into a transition in the final patterns of the species repartition. Finally assuming that the disorder is small, we exhibit an explicit solution of the dynamical mean-field equation for the species density, obtained as the fixed point of nonlocal Fisher-Kolmogorov-Petrovski-Piskounov equations. Our work paves the way of future combined approaches at the frontier of active matter and disordered systems, with the hope of better understanding complex ecosystems like bacterial communities.*