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Population dynamics models with non-local spatial interactions: from spatial patterns to species coexistence.

Abstract
From microbial colonies to entire landscapes, biological systems often self-organize into regular spatial patterns, which might have significant ecological consequences. Several models have been proposed to explain the emergence of these patterns. Most of them rely on a Turing-like activation-inhibition scale-dependent feedback whereby interactions favoring growth dominate at short distances and inhibitory, competitive interactions dominate in the long-range. However, the importance of short-range positive interactions for pattern formation remains disputable. Alternative theories predict their emergence from long-range inhibition alone. In this presentation, I will explain how self-organized patterns might emerge in purely competitive models. I will first present in which conditions long-range competition alone can generate regular patterns of population density in systems with one and two species. Then, I will discuss the ecological implications of those patterns both for population persistence and species coexistence.