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**STEPHEN CANTRELL**, University of Miami

*Resource matching in spatial ecology and evolutionary advantage*

A convergence of concepts from game theory (evolutionary stable strategy), ecological theory (the ideal free distribution), and mathematics (line sum-symmetry and its functional analytic generalizations) combine to explain how resource matching in spatially heterogeneous but temporally constant habitats can convey evolutionary advantage robustly across a range of modeling formats. The ideal free distribution (IFD) is an ecological construct that posits that when organisms have full knowledge of the landscape they inhabit (ideal) and are able to locate themselves as they wish (free), they will locate themselves to maximize reproductive fitness. The IFD can readily be translated into mathematical terms for models wherein the environment is spatially varying but temporally constant. In this talk we will discuss how this is done across a range of modeling formats and how it consequently leads to predictions of evolutionary advantage in such modeling formats. We then report on ongoing efforts to define the ideal free distribution mathematically in cases when the environment varies in both space and time, focusing on the case wherein habitats vary periodically in time.