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The fate of complex ecologies: How do species organize? An exact method[1] AHMED ROMAN, MICHEL PLEIMLING, Virginia Tech — Complex ecology models present a bridge between far from equilibrium physics and biology of populations. The May-Leonard, Rock-Paper-Scissor and Lotka-Volterra models have been extensively studied in an attempt to understand the dynamics of finite but large populations. In this talk we present a new theoretical technique which predicts the dynamics of these models for any complex ecology with interactions similar to the aforementioned models. This method has applications to real-world systems as it presents a simple method to predict correlations among two or more species in a complex ecology. We apply this method to the models mentioned and show that exact agreement between predictions and Monte-Carlo simulation data is obtained. This method could be applied to a wide variety of problems from economics to biology and game theory.

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