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**Statistical physics applied to ecology**

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Understanding an ecosystem is a formidable many-body problem. One has an interacting system, made up of individuals of various species with imperfectly known interactions, mainly governed by chance and characterized by a wide range of spatial and temporal scales. For example, in tropical forests across the globe, ecologists have been able to measure certain quantities such as the relative species abundance distribution, the species area relationship, and beta diversity, the probability that two trees separated by a given distance belong to the same species. In order to make progress, it is important to distill what one hopes are the essential ingredients of an ecosystem and incorporate them in tractable models whose predictions can then be compared with the observed data. Such an interplay between empirical data and theory is useful for the formulation of realistic models of ecosystems. A summary of recent work along these lines will be presented. Co-author: Amos Maritan  
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