Abstract for an Invited Paper
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Scaling Laws, Fluctuations and Pattern Formation in Ecosystems[1]

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Ecology is fundamentally concerned with the relationship of organisms to space and time. Thus, it is natural for statistical physicists to ask if there are universal phenomena, and if so, how they can be separated from purely idiosyncratic features of special systems. This talk will focus primarily on fluctuations in ecosystems, showing how certain well-documented scaling laws, such as the species-area law, follow from rather general properties of ecosystems. Fluctuations, especially demographic noise, drive patterns in space and time, and we will review how this solves the predator-prey limit cycle paradox, and can account for the robust occurrence of patchiness in ecosystems.

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