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Abstract for an Invited Paper
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Metabolic scaling and biodiversity of forests¹

JAYANTH BANAVAR, University of Maryland

Forests are biologically diverse and play a critical role in the dynamics of earth-climate systems. A forest is a tremendously complex system comprising co-existing rooted trees of many species and many sizes and utilizing resources from the environment. The trees interact with each other and with their environment and the interactions are not precisely known. Using scaling ideas, we will present a theoretical framework for understanding the role of geometry in determining the metabolic rate of a tree and of a forest. The quantification of tropical tree biodiversity and their abundances is still an open and challenging problem. Using a global-scale compilation, we will present a method that allows one to predict, from local censuses, the biodiversity and patterns of species abundance at the whole forest scale. The method allows one to quantify the minimum percentage cover of the forest that should be sampled in order to have a precise prediction of the estimates of biodiversity and species abundances.

¹Collaborators: Amos Maritan, Tommaso Anfodillo, Sandro Azaele, Marco Favretti, Marco Formentin, Jacopo Grilli, Samir Suweis, Anna Tovo, Igor Volkov