# QUANTITATIVE AND SYSTEMS BIOLOGY COLLOQUIUM:
## Ecological networks across levels of organization

## Paulo R. Guimaraes Jr.
### Universidade de Sao Paulo

**Date:**

1/23/2025

**Time:**

10:30 AM - 11:45 AM

**Location:**

COB1 114

### About the Speaker:

Paulo Guimarães is a Full Professor of Ecology at the University of São Paulo. His research explores the origin, maintenance, and fragility of interaction patterns in species-rich ecological assemblages, focusing on ecological and evolutionary processes at different scales. He combines empirical data, natural history, mathematical modeling, and network science to study ecological networks, especially plant-animal interactions in tropical ecosystems. His work has identified general patterns in these networks and their implications for coevolution and conservation. Paulo earned his biology degree, MSc, and PhD in Ecology from Unicamp (Brazil), with postdoctoral research in statistical mechanics at Unicamp and evolutionary biology at the University of California, Santa Cruz.

### Abstract:

Ecological interactions connect the units of ecological systems, generating networks that are observed at different levels of organization. At the population level, ecological networks characterize variation in niches among individuals of a given population. At the community level, population niches combine with each other, forming networks of species. In this talk, I will explore how the interplay between fundamental architectural laws operating in networks and the evolution of highly connected species favor the emergence of interconnected networks. These interconnected networks are characterized by pathways that allow indirect effects to propagate across ecological communities, fostering novel ecological and evolutionary dynamics. The novel dynamics fostered by indirect effects may affect disparate phenomena in ecological communities, from coextinction dynamics to the coevolution of species-rich assemblages.

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