

Tesis Doctoral

Departamento de Física Teórica

“Contagion Dynamics in Multilevel and Structured Populations”

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Abstract:

There are abundant contagion processes taking place on networks, such as the spreading of diseases, rumors, information, and other nonlinear phenomena in complex human systems. From the perspective of mathematical modeling, contagion processes in networked populations are becoming increasingly sophisticated with various types of nontrivial interactions involved. Models have evolved from the relatively simple compartmental methods to structured frameworks with heterogeneities of populations taken into account. In addition, to portrait the hierarchies and heterogeneities in complex human systems, we also consider the multilayer representative of the populations. In this thesis, we attempt to explore the tip of the iceberg in contagion processes occurring in populations by conceptualizing them with various mathematical models. We aim at understanding the intricacies of contagion dynamics in multilevel and structured populations from a theoretical level and application level.

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