Multi-agent models in complex networks

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This course provides an introduction to the use of Statistical Physics tools for the analysis andunderstanding of multi-agent systems. Most systems in this realm are composed by elements (generically termed agents) that do not act in isolation and are inhomogeneous. As a result of theirinteraction, complex behavior is usually observed at a macroscopic scale and the systems operateusually in out-of-equilibrium conditions. Therefore, advanced techniques from Statistical Mechanicsare suited for understanding some of their properties. The objectives of the course are to allow thestudents to understand the modeling approach taken to uncover the mechanisms behind large-scale phenomena and assimilate its underlying difficulties, limitations and strengths. Specialemphasis will be given at the interpretation of the parameters included in the models.

The course will be organized in four classes comprising the following topics:

1 – Introduction to generic properties of Agent-based models and Complex Systems.

2 – Social Influence and opinion formation models.

3 – The Axelrod model: cultural dynamics and Mass Media Influence modeling