

THE COMPLEXITY OF NETWORKS AND SOCIAL DYNAMICS

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4:00 p.m. NSH 127

(Refreshments at 3:30 p.m. NSH 202)

This seminar is a brief excursion across some problems I have been investigating over the last few years. Networks are the simplest representations of complex systems and their investigation may shed light on the structure and function of many systems. I will discuss the problem of community detection, i.e. of finding subgraphs with a high density of internal edges, whereas the density of edges between subgraphs is comparatively low. I will focus on the issues of resolution of global optimization methods and of testing methods against each other. I will also introduce a new multipurpose method based on the statistical significance of clusters. Next, I will enter the realm of sociophysics, i.e. of how statistical physics can help to uncover the collective dynamics of large-scale social systems. The main weakness of this field is the absence of a quantitative phenomenology, as little attention is paid to the relationship between models and real systems and models are usually studied for their own sake. It is then necessary to search for empirical regularities in social data, like scaling and universality, that could somehow inspire and validate a statistical physics modeling of social dynamics. I will present recent results on voting and citation behavior.

Colloquium

All interested
persons are
cordially
invited to
attend.