

EDITORIAL: COMPLEX NETWORKS

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This topical issue features regular submissions to *Advances in Complex Systems* focusing on ‘Complex Networks’ from different perspectives. They have been selected by the editors to appear together in this issue, to highlight current research trends.

‘Complex Networks’ is a booming research area for quite a few years now. Since the work of Watts and Strogatz on ‘small world networks’ published in 1998 (a paper for which Google Scholar lists 7417 citations as of 14th February 2009), a *networkmania* has exploded in many applied fields of science. This led to the rediscovery of various results already present in the mathematical literature on graphs. However, the increasing interest on networks also led to the rediscovery of some gems in sociology, including the work of Granovetter on social networks already published in 1973.

Today, research on complex networks has expanded to various branches of science, ranging from biology to transportation, from economics to linguistics. Hence, it is becoming a truly interdisciplinary endeavor. It is worth noticing that the research in these areas is increasingly driven by available data, in addition to extending theoretical concepts to characterize these networks.

The current topical issue reflects some of the recent activities. The first two papers apply the complex network approach to dynamic phenomena in molecular biology, while the next two papers focus on spatial networks. These are followed by papers focusing on economic networks and on networks describing human social interaction. Finally, the last paper demonstrates an application of the complex

network approach in linguistics, one of the emerging hot topics in this field (cf. also the Topical Section on '*Language Dynamics*' in ACS, Vol. 11, Issue 3, June 2008).

In addition to the different interdisciplinary applications, these papers also focus on different network features. While some investigate the topology of networks in detail, without considering dynamical aspects, others take the time evolution of the links or even the nodes into account. All these aspects eventually contribute to a more thorough understanding of the complexity underlying these phenomena, and to a more complete theory of 'complex networks'.

We sincerely hope that the selection of papers presented here will stimulate further research in a genuinely interdisciplinary field with more and more attention to mathematical soundness as well as to empirical validations of refined dynamical models.