

# Physical approaches to Complex Systems

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Typically, complex systems are natural or social systems which consist of a large number of interacting elements with the following striking property: the existence of emergent phenomena which cannot be simply derived or predicted solely from the knowledge of the systems' structure and the interactions among their individual elements. Network Science, i.e. the application of graph theory to complex systems, has shown in recent years to be one of the major interdisciplinary approaches in several fields including neuroscience, economy, epidemiology and many others. In this talk, the theory of complex networks will be introduced using many application examples, and going so far as to talk about the most recent generalizations, such as higher order networks