

武汉物数所理论交叉学术交流系列报告 (第一一九期)

Synchronization of Complex Networks

Prof. Xingang Wang (王新刚)
Shaanxi Normal University

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About the speaker : X.G Wang got his PhD degree at Beijing Normal University in 2002. He joined the Temasek Laboratories at National University of Singapore as a research scientist, collaborating with Prof. Choy Heng Lai after graduated. In 2008, he joined the Physics Department of Zhejiang University, working on fusion plasma theory. In 2013, he joined Shaanxi Normal University, and now is working in the Physics Department as a “Qujiang” Professor. His research interest is mainly focusing on the collective dynamical behaviors of complex systems, including synchronization dynamics, pattern formation, complex networks, laser plasma, turbulence control, etc. He has published more than 60 papers, which have been cited about 600 times.



Abstract : As a universal concept in nonlinear science, the synchronization of coupled oscillators has been commonly interested and extensively studied by researchers from different fields. Recently, with the discoveries of the small-world and scale-free structure in man-made and natural complex systems, a new surge of studies has been appeared in exploring the synchronization behaviors of complex networks. In this talk, I shall give a brief introduction on the progresses we made in the past years on network synchronization. Starting from an experimental demonstration, I shall first introduce the phenomenon of oscillator synchronization. Then, by the example of gradient complex network, I shall show how the synchronization dynamics is influenced by the network structure. Finally, I shall demonstrate the formation and control of synchronous patterns in complex networks, as well as its implications to the functioning and operating of neural complex systems.

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