

Theoriekolloquium

Am **20. Juni 2019** um **14.15 Uhr** in **W2 1-143** hält

Frau Dr. Anna Zakharova (Berlin)

einen Vortrag mit dem Titel

Dynamics and control of multilayer networks

The prime objective of multilayer networks is to explore multiple levels of interactions where functions of one layer get affected by the properties of other layers. One of the most promising applications of the multilayer approach is the study of the brain, or technological interdependent systems, i.e., those systems in which the correct functioning of one of them strongly depends on the status of the others.

For instance, multilayer networks with interconnected layers naturally occur in electrical power grids and transportation systems. Moreover, multiplexing is important for controlling, since it is not always possible to directly access and manipulate the desired layer, while the network it is multiplexed with may be adaptable. We investigate multilayer networks of coupled FitzHugh-Nagumo neurons and focus on the case of weak multiplexing, i.e., when the coupling between the layers is smaller than that inside the layers. It turns out that weak multiplexing has an essential impact on the dynamical patterns observed in the system and can be used for controlling in both oscillatory and excitable regimes. In the oscillatory regime, we show that different types of partial synchronization patterns can be induced and suppressed. For the excitable regime with noise, we find that weak multiplexing induces coherence resonance in networks that do not demonstrate this phenomenon in isolation.

Interessierte sind herzlich eingeladen.

gez. Prof. Dr. Alexander Hartmann