

# Eugene Wigner Colloquium

*joint event of GRK 1558 and SFB 910*



## Prof. Inmaculada Leyva

Rey Juan Carlos University, Madrid

### “Relay synchronization in multiplex complex networks”

Very recently, relay and remote synchronization have captured the attention of researchers. This form of synchronization is observed when two units of a network synchronize despite not being directly linked due to the intermediation of a relay mismatched unit. The phenomenon is of outstanding relevance in the brain, since the thalamus acts as a relay between distant cortical areas playing the role of a coordination hub.

Recently, remote and relay synchronization has been addressed in the context of complex networks, revealing the important role of network structural and dynamical symmetries. In our work we have applied the concept of relay synchronization to the case of a multiplex network, showing that the phenomenon can be extended to indefinitely higher order relay configurations, provided symmetry is preserved. The coherent state is very robust to strong multiplex disconnection, being the low degree nodes responsible for resilience of the synchronous state, while hubs can be safely de-multiplexed. Our results provide a new path for starting the study of the role of symmetries in setting long distance coherence in real systems.

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**Thursday, 01.02.18 · 16:15h · EW 202**

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