KIEL NANO SURFACE & INTERFACE SCIENCE

KiNSIS Colloquium
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Dynamical Networks: A Primer

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Abstract
The roots of today`s dynamics and topology of networks goes back to the seminal work of Christiaan Huygens (1665) and Leonhard Euler (1735), respectively. Huygens recognized synchronization phenomena in a system of mechanically coupled pendulum clocks. His experiments and mathematical descriptions laid the foundation for the research field of nonlinear dynamics. Leonhard Euler paved the way to graph theory by analyzing the topological background of the “Köngisberg walk”.
Since the 1980s of the last century new ways have been found of quantifying the topological and modeling of large systems of interacting agents and striking commonalities have been observed in the organizational properties of a broad arrays of real-life networks, including (but not limited) to air transportation networks, virus spreading, microchips, the internet and nervous systems. The so-called *small-worlds* network attracted considerable interest, because many biological and technical systems can be described within this framework. In general, network topology plays an important role in constraining systems dynamics and reciprocally system dynamics can often drive the evolution or development of network topology. I will present in a qualitative way a few examples of dynamical networks, such as sensor swarms, the functional and structural connectivity of nervous systems, and the stabilization of energy networks. The talk concludes by presenting the role of dynamical networks in the CRC1461: Neurotronics.

Access
to the online presentation (Zoom-Meeting)
https://uni-kiel.zoom.us/j/89783278309?pwd=WXhnUllFOWFmL2hkOEp5NUt6RXh6Zz09
Meeting-ID: 897 8327 8309
Kenncode: 988298

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If you are interested in presenting your topic, please contact Julia Jedtberg (jfr@tf.uni-kiel.de)

More information: www.kinsis.uni-kiel.de/en/dates-and-events/kinsis-colloquium