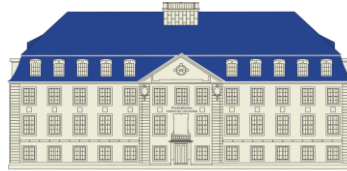




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## COLLOQUIUM „OPTICS AND CONDENSED MATTER“

***Christopher Wächtler***

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### **Limit Cycles and Synchronization Go Quantum**

Synchronization -- either to an external drive or among a collection of self-oscillating systems -- emerges in an impressively vast variety of seemingly unrelated subjects, settings, and situations. Despite its long history dating back to Huygens and its rich literature, synchronization continues to be of great fundamental interest as a prime example of a non-equilibrium phase transition and of practical interest with a myriad of applications in modern science and technology. Research on quantum synchronization started rather recently, yet it is of considerable current interest from both basic and applied perspectives. As the underlying description of the world is quantum, it is natural to wonder as to how synchronization is modified if the degrees of freedom that synchronize feature quantum fluctuations and thus have to be described by quantum mechanics. In this talk, I will give an overview of different attempts to define and explore quantum aspects of synchronization. Additionally, I will discuss the new frontier of topological quantum synchronization, an interdisciplinary topic which combines topological concepts with synchronization to explore genuine quantum effects of synchronized dynamics and significantly enhance its robustness.

**July 2nd, starting with discussion at 17:00 h, talk at 17:15 h, live IAP lecture hall or via Zoom**

<https://uni-bonn.zoom.us/j/98441612025?pwd=a01SSjlkY1Q3SDFhL09JQk1qc1V6dz09>

Meeting-ID: 984 4161 2025

Kenncode: 294164