



Universität
Basel

Research Project

Quantum synchronization and quantum phase transitions in arrays of nano- and optomechanical systems

Third-party funded project

Project title Quantum synchronization and quantum phase transitions in arrays of nano- and optomechanical systems

Principal Investigator(s) [Bruder, Christoph](#) ;

Organisation / Research unit

Departement Physik / Theoretische Physik (Bruder)

Department

Departement Physik

Project start 01.04.2021

Probable end 31.03.2025

Status Active

We will explore novel aspects of quantum synchronization in networks of self-sustained oscillators. This includes even-odd effects in the number of levels of the synchronization nodes and the dependence on network topology (number of neighbors and interaction range). Another interesting direction that we will study is frustration effects and possible links to frustrated quantum spin systems. Furthermore, we will investigate symmetry-breaking pattern formation in synchronization networks

Using unsupervised machine-learning schemes, we will investigate phase diagrams of models that exhibit synchronization or other types of long-range order.

We will also explore neural network architectures that involve physical insights and recent innovations in machine learning to compute steady states of driven dissipative quantum systems.

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Add publication

Add documents

Specify cooperation partners