

Physikalisches Kolloquium
Einladung**Physics Colloquium**
Invitation**Monday, 12 May 2025**

Lecture Hall N24/H13, at 16:15

Coffee and cookies will be served in front of the lecture hall from 16:00

Quantum simulation in Superradiance lattices**Professor Dawei Wang**
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In order to investigate quantum many-body problems beyond classical computational capability, artificial quantum systems are used to synthesize and simulate the target Hamiltonian. As a widely-used platform, ultracold optical lattices have realized various exotic quantum phases of matter. However, the quantum control inevitably results in heating effect that destroys the simulated quantum matter. In order to address this issue, a room-temperature quantum simulation platform is developed based on momentum-space Superradiance lattices. In this talk, I will report the recent progress on Superradiance lattices, including the observation of chiral edge currents, flat-band localization, and dynamical localization-delocalization. Based on Superradiance lattices, a spectroscopic method is presented to measure the geometric phases of topological matter, and a various of optical devices such as the optical diode can be designed. Superradiance lattices provide new techniques and methods for quantum metrology and quantum computing.

