

Physikalisches Kolloquium

Di 30.10.18
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



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Novel platforms for quantum science and technology

The 'second quantum revolution' aims at exploiting coherence for novel technologies, e.g. computation, simulation, communication, and sensing. These platforms will likely involve electromagnetic, mechanical, as well as topological degrees of freedom as building blocks.

I will start by introducing cavity optomechanics, a rapidly-growing field where mechanical degrees of freedom are coupled to electromagnetic cavity modes. Showcasing its impact on technology, I will discuss non-reciprocity due to synthetic magnetic fields and reservoir engineering [Nat. Comm. 8, 604 (2017), PRL 120, 023601 (2018), PRB 97, 165308 (2018)].

These developments also lead to many-body problems interesting in their own right. I will discuss the robustness of Majorana edge modes under disorder and interactions, presenting exact analytical topological phase diagrams for Kitaev chains [PRB 96, 241113(R) (2017)].