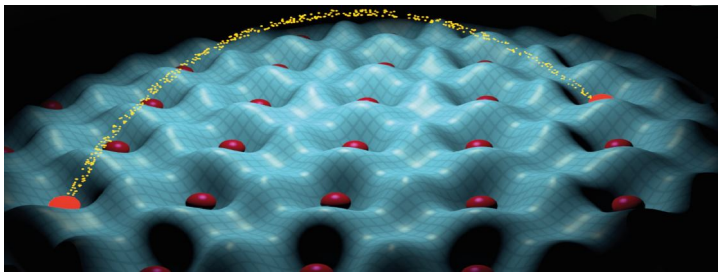

Contribution ID: **5** Type: **not specified**

”Engineering of many-body states in a driven-dissipative cavity QED system”

Monday, 17 June 2024 14:00 (30 minutes)

Exposing a many-body system to external drives and losses can fundamentally transform the nature of its phases, and opens perspectives for engineering new properties of matter. How such characteristics are related to the underlying microscopic processes is a central question for our understanding of materials. A versatile platform to address it are quantum gases coupled to the dynamic light fields inside optical resonators. This setting allows to create synthetic many-body systems with tunable, well-controlled dissipation channels, and at the same time to induce cavity-mediated long-range atom-atom interactions.
After an introduction to this platform, I will describe experiments in which the interplay between drive and dissipation induces limit cycles and transport of the atoms. In a second set of experiments, we make use of the cavity-mediated interaction to induce the formation of pairs of correlated atoms. We demonstrate that this process is based on the amplification of vacuum fluctuations.

Presenter: DONNER, Tobias (ETH Zurich)