

## **Many-body quantum optics in superconducting circuits**

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Superconducting circuits provide an excellent platform for the study of non-equilibrium phase transitions of light. In circuit QED, a superconducting qubit mediates very strong effective photon-photon interactions. In networks of circuit QED elements, a competition between hopping and interactions can be realized, leading to steady state phase transitions in a damped driven system. Here, we will discuss dynamical phase transitions in a circuit QED dimer and dissipative phase transitions observed in a one-dimensional lattice, tunable interactions in a bandgap medium, and progress towards understanding lattices in curved space.