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Title: Quantum Ising machines with parametrically modulated nonlinear oscillators

Quantum annealing exploits quantum fluctuations to solve combinatorial optimization problems that can be encoded into the couplings of Ising Hamiltonians. In this talk, I will introduce a new paradigm for quantum annealing that relies on continuous variable states. In this approach, quantum information is encoded in two coherent states of the field that are stabilized by two-photon driving in a nonlinear resonator. To motivate the underlying physics, I will first present an approach to prepare high-fidelity cat states in this system. I will then outline an adiabatic annealing protocol in an all-to-all connected network of nonlinear resonators. Numerical simulations indicate substantial resilience to photon loss in this system. Finally, I will discuss realizations of these ideas in superconducting circuits.