

## Quantum simulations of collective neutrino oscillations

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In extreme astrophysical environments like core collapse supernovae, neutron star mergers and the early universe, neutrino flavor oscillations can be substantially modified by neutrino-neutrino scattering. Models of this process require the solution of a strongly coupled many particle problem. In this project we aim to exploit the similarity between the neutrino flavor Hamiltonian and a many-spin system to design quantum simulations to describe out-of-equilibrium flavor processes. In particular we intend to exploit the availability of pulse level control in superconducting qubit systems to increase the reliability of dynamical simulations.

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