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Recent Progress in Neutron-Antineutron Oscillation Theory

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The observed matter-antimatter asymmetry of the universe is an outstanding mystery of physics that cannot be explained within the Standard Model. Many beyond the Standard Model (BSM) explanations have been proposed, and experimental data is needed to constrain the wide theory space of BSM models. Neutron-antineutron oscillations are predicted to be a signature of some BSM baryogenesis models and can be cleanly probed by low-energy experiments. Connecting experimental data on neutron-antineutron transition rates to fundamental BSM theory parameters requires QCD matrix elements of six-quark operators effectively parameterizing BSM physics at low energies. I will discuss recent work by myself and others to reliably determine these matrix elements through lattice QCD simulations and renormalization group analysis necessary to connect BSM scales to computationally accessible lattice QCD scales.

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