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Lattice field theory: QCD and beyond

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Lattice simulation is a numerical technique for the non-perturbative investigation of quantum field theories. It has been very successful in precise studies of the strong nuclear force (quantum chromodynamics, or QCD.) In this talk I will review the basic framework of lattice simulations, and then describe current and future applications in particle physics, including the study of heavy-quark decays and searches for new strongly-coupled physics at the Large Hadron Collider.