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Nuclear Physics from Lattice Simulations

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Nuclear lattice simulations are a new tool to address the nuclear many-body problem. They combine the successfull Effective Field Theory approach to the nuclear force problem with Monte Carlo simulations, thus allowing for *ab initio* calculations of atomic nuclei. I give a short overview of the method and then present recent results on the spectrum of ^{12}C, in particular on the Hoyle state, its structure and its excitations. First results for the spectrum of ^{16}O are also shown. Further, I discuss the formation of carbon and other elements relevant for life on earth as a function the fundamental parameters of QCD and QED, the quantum gauge field theories underlying all of nuclear physics.