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Abstract for an Invited Paper
for the APR16 Meeting of
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J.J. Sakurai Prize for Theoretical Particle Physics: 40 Years of Lattice QCD¹

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Lattice QCD was invented in 1973-74 by Ken Wilson, who passed away in 2013. This talk will describe the evolution of lattice QCD through the past 40 years with particular emphasis on its first years, and on the past decade, when lattice QCD simulations finally came of age. Thanks to theoretical breakthroughs in the late 1990s and early 2000s, lattice QCD simulations now produce the most accurate theoretical calculations in the history of strong-interaction physics. They play an essential role in high-precision experimental studies of physics within and beyond the Standard Model of Particle Physics. The talk will include a non-technical review of the conceptual ideas behind this revolutionary development in (highly) nonlinear quantum physics, together with a survey of its current impact on theoretical and experimental particle physics, and prospects for the future.

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