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Muon $g-2$ theory overview

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Fermilab announced a new experimental result for muon $g-2$ on April 27, 2021. The statistical uncertainty of the new result is similar to the previous BNL result and the central value is consistent. The combined value is 4.2 standard deviations away from the Standard Model prediction. An update from Fermilab with much more statistics is expected soon. For the Standard Model prediction, the two hadronic contributions, HVP (hadronic vacuum polarization) and HLbL (hadronic light-by-light) are the dominant sources of uncertainty. I will review the recent updates on the theoretical determination of these two contributions with lattice QCD calculations and dispersive approaches.

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