

Muon $g-2$ - Status of theory and experiment

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Tuesday, September 14, 2021, 10:00 - 10:30

The muon anomalous magnetic moment, $a_\mu = (g - 2)/2$, is a low-energy observable which can be both measured and computed with very high precision, making it an excellent test of the Standard Model (SM) and a sensitive probe of new physics. Recent efforts improved the precision of both the theoretical prediction and the experimental measurement. On the theory side, the Muon $g-2$ Theory Initiative, an international team of more than 130 physicists, reached in 2020 a consensus on the SM prediction for a_μ . On the experimental side, the E989 Muon $g-2$ collaboration at Fermilab published in April 2021 a new measurement of a_μ from the Run 1 dataset (2018) with 0.46 ppm precision, corroborating the previous BNL measurement and increasing the discrepancy with the SM value to 4.2 standard deviations. On the other hand, a recent lattice QCD result weakens this discrepancy. This presentation will cover both theoretical and experimental aspects of this exciting topic of particle physics.