

## The Muon $g-2$ Experiment: Current status and outlook

*Thursday, 4 August 2022 12:20 (30 minutes)*

First results from the Fermilab Muon  $g - 2$  experiment were announced in 2021. The muon's anomalous magnetic moment  $a_\mu$  was measured to an unprecedented 460 ppb precision, and the result is in agreement with the previous Brookhaven National Lab measurement. The  $4.2\sigma$  tension between the combined experimental result and the Standard Model theoretical prediction suggests new beyond-Standard-Model physics. Analysis of Run 2 and 3 data is in progress, which is expected to reduce the experimental uncertainty by  $2\times$ . Meanwhile Run 5 data collection was recently completed, reaching very close to the total goal of  $20\times$  Brookhaven statistics. In this talk I will present the Fermilab  $g-2$  measurement approach and the Run 1 result, and then focus on the experiment's current status and outlook. Experiment upgrades since Run 1 have improved stability of the detector and storage ring systems, and refined characteristics of the stored muon beam. These together with specialized measurement campaigns, analysis improvements, and simulation efforts aim to reduce dominant systematic uncertainties toward the ultimate precision goal of 140 ppb.

### Attendance type

In-person presentation

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