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The muon g-2 experiment at FNAL

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The E989 collaboration has recently published the most precise measurement of the muon anomalous magnetic moment a_μ with an uncertainty of 460 ppb. The new experimental world average of a_μ deviates by 4.2 standard deviations from the Standard Model prediction provided by the Muon g-2 Theory Initiative. The emerging results from ab-initio lattice QCD calculations allow to scrutinize this tantalizing hint for physics beyond the Standard Model for the first time in a three way comparison. To extract the value of a_μ a clock comparison experiment is performed with spin-polarized muons confined in a superbly controlled electric and magnetic field environment. The deviation of the Larmor from the cyclotron frequency, the anomalous spin precession frequency, is determined while a high-precision measurement of the magnetic field environment is performed using nuclear magnetic resonance techniques. I will discuss the most recent result from the first science data run in 2018 and will report on the experimental improvements implemented to achieve the ultimate goal of 140 ppb uncertainty on a_μ .

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