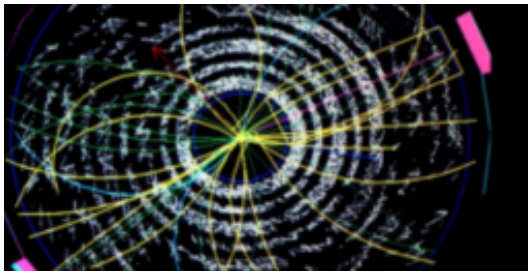

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The Muon g-2 experiment at Fermilab

Tuesday, 6 June 2017 16:00 (15 minutes)

Precise measurements of the anomalous magnetic moment, a = (g - 2)/2, of the muon provide strong tests of the Standard Model, and are more sensitive to physics beyond the Standard Model than measurements of the electron anomalous magnetic moment. The most recent measurement of the muon magnetic moment at Brookhaven E821 has hinted at new physics, with its result differing from theoretical calculations by over three standard deviations, with an uncertainty of 540 ppb. The new Fermilab E989 experiment seeks to improve on both the statistical and systematic errors of the measurement with a projected uncertainty of 140 ppb, which represents a four-fold improvement on the Brookhaven result. The experiment will use the high intensity muon beam at the new Fermilab muon campus, and store polarized muons in a magnetic storage ring. The magnetic field with be monitored by an array of calibrated NMR probes; calorimeters will measure muon decays as they travel around the ring, which indicates the spin direction. The combined measurements of the magnetic field and muon precession rate can be used to calculate the anomalous magnetic moment. A general overview of the theoretical motivation, experimental techniques, and possible implications of the experiment will be presented.

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