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Dark Matter and muon g-2 in the MSSM

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Fifteen years after the BNL measurement of the anomalous magnetic moment of the muon (g-2) which led to the famous muon g-2 anomaly, this deviation from a prediction of the Standard Model was confirmed in 2021 by the Fermilab muon g-2 experiment. The state-of-the-art Standard Model prediction and the measured values of g-2 now differ by more than 4 standard deviations. In this talk, I will discuss explanations of the g-2 anomaly in the simplest supersymmetric model, the MSSM. In order to explain the g-2 anomaly, at least some of the superpartners of the Higgs boson, the W-bosons, and the muon (neutrinos) should have masses below a few hundred GeV. This has important implications for Dark Matter explanations in the MSSM and to provide Dark Matter candidates in the hundred GeV mass range which provide the observed relic density via standard freeze-out production, are compatible with upper limits from direct detection experiment, and null-results from LHC searches for SUSY particles. Such models can be tested by the current multi-tonne scale direct detection experiments and by upcoming data from the LHC.

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