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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. I will discuss the physical mechanisms at work to simultaneously explain the muon g-2 anomaly 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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