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Muon g-2 and EDM in the post FNAL era

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The FNAL muon g-2 experiment has measured the anomalous magnetic moment of the muon with an unprecedented precision of 127 ppb [1]. In parallel, significant theoretical efforts are underway to predict the Standard Model (SM) value of muon g-2 with comparable precision [2]. A new experiment aiming to simultaneously measure the muon g-2 and electric dipole moment (EDM), using the world's first muon LINAC, and a compact storage magnet is being prepared at the Japan Proton Accelerator Research Complex (J-PARC) [3]. The J-PARC experiment will provide an independent determination of muon g-2 with largely different systematics and will search for the muon EDM with a sensitivity 70 times greater than the current limit. This talk will present the current status of the experiment and the prospects for achieving a precision surpassing that of the FNAL measurement.

[1] D.P. Aguillard, et al., Phys. Rev. Lett., 135 (2025).
[2] R. Alberti, et al., Phys. Rep. 1143, 1 (2025).
[3] M. Abe, et al., PTEP, 2019, 053C02 ((2019)

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