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The Proton Radius Puzzle- A problem for all of us¹

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The extremely precise extraction of the proton radius obtained by Pohl et al and Antognini et al from the measured energy difference between the 2P and 2S states of muonic hydrogen disagrees significantly with that obtained from electronic hydrogen or elastic-electron proton scattering. This discrepancy is known as the proton radius puzzle. The talk explains the origins of this puzzle and the reasons for believing it to be important. In particular, the muon-proton interaction may differ from the electron-proton interaction in unexpected ways. Various possible solutions of the puzzle are identified and the future research needed for resolution is discussed.

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