

## The Proton Radius Puzzle

*Wednesday, 18 October 2023 10:00 (30 minutes)*

The Proton Radius Puzzle has been famously known as the discrepancy of the proton charge radius between measurements using the novel method of muonic hydrogen spectroscopy and the conventional methods of regular hydrogen spectroscopy and electron scattering. Suggested explanations have ranged from hidden experiment systematics through unaccounted effects in conventional theory to New Physics beyond the Standard Model. Defined as the slope of the electric form factor, the proton charge radius manifests itself in altered energy levels observed in atomic hydrogen transitions, or in the angular distribution of elastic lepton scattering at low momentum transfer. In all methods, precisely calculable QED effects are taken into account. A variety of new experimental efforts have been devised over the past decade with the goal to resolve the puzzle, some of which have already obtained results, while others are ongoing. So far, the majority of new data have trended toward a smaller radius as suggested by muonic hydrogen, however a satisfactory understanding of the puzzle has not yet been achieved. An overview of the present status of the field will be provided.

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### Parallel Session

Invited Plenary Talk

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**Session Classification:** Plenary talk