

Abstract Submitted
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The Muon Proton Scattering Ex[eriment (MUSE) EVANGELINE DOWNIE¹, George Washington University, MUSE COLLABORATION — The proton radius puzzle began in 2010 when the CREMA Collaboration released their measurement of the proton radius (Pohl et. al (2010)) from muonic hydrogen spectroscopy: $r_p=0.84184(67)$ fm, This was five standard deviations smaller than the accepted CODATA value at that time ($0.8768(69)$ fm), and sparked an enduring and intriguing puzzle. MUSE, the MUon proton Scattering Experiment, was first proposed in 2012 to be the first muon proton elastic scattering experiment with sufficient precision to address the proton radius puzzle. MUSE has the capacity to simultaneously measure elastic muon-proton, and electron-proton scattering, and switch polarities to measure with opposite charge states. As such, MUSE can directly measure the two-photon effect by comparing charge-states, and compare muon and electron scattering with minimal systematic error. We will review the motivation for and status of MUSE, which is due to begin production running in 2019.

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Evangeline Downie
George Washington University

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