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Exploring physics beyond the Standard Model with a Muon Acceleration Facility

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An accelerator complex that can produce ultra-intense beams of muons presents many opportunities to explore new physics. A facility of this type is unique in that, in a relatively straightforward way, it can present a physics program that can be staged and thus move forward incrementally, addressing exciting new physics at each step. An intense cooled low-energy muon source can be used to perform extraordinarily precise lepton flavor violating experiments. These same muons can be accelerated and then stored in a race track-like storage ring to produce neutrinos for experiments to explore neutrino mixing with unprecedented precision, creating the so-called Neutrino Factory. Finally, these muons could be accelerated to very-high energy to do energy-frontier physics with a muon collider. In this talk I will give an introduction to muon accelerator facilities and their physics capabilities and then will discuss some of the limiting technologies that must be developed in order to make these concepts a reality and the US Muon Accelerator Program that aims to address these technical challenges.

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