Contribution ID: **9** Type: **not specified**

Muon-Ion Collider: Physics Perspectives

Wednesday, 5 April 2023 14:10 (30 minutes)

The development of muon accelerator and storage ring technology at the TeV scale provides enormous scientific potential not only for a mu+mu- collider, but also for deep inelastic scattering in a completely new regime when a TeV muon beam is brought into collision with a high-energy hadron beam. For example, if the Electron-Ion Collider at BNL were eventually upgraded with a TeV muon beam replacing its low energy electron ring, a Q^2 reach of up to 10^6 GeV^2 is accessible and a parton momentum fraction x down to 1.0×10^{-5} can be probed. Such a Muon-Ion collider provides a natural first science case for the development of high-energy muon accelerator technology. In this talk we summarize the science case for a muon-ion collider, which includes precision structure function measurements, QCD and electroweak measurements, standard model particle production and coupling measurements including the Higgs boson, and searches for beyond standard model physics in second-generation fermion couplings such as Z-prime and leptoquark production.

Primary author: ACOSTA, Darin (Rice University)

Presenter: ACOSTA, Darin (Rice University)

Session Classification: Afternoon Session