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Muon Colliders: a challenging opportunity

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Muon colliders provide a unique route to deliver high energy collisions that enable discovery searches and precision measurements to extend our understanding of the fundamental laws of physics. All this at a single collider and on a feasible timescale, as recently reviewed in the frame of the European Roadmap for Accelerator R&D.

Muons can be accelerated in rings up to very high energies, without fundamental limitation from synchrotron radiation. The recently formed International Muon Collider Collaboration at CERN targets the design of a muon collider facility with a center of mass energy of 10 TeV or slightly more, which seem feasible and sustainable with technologies that can be made available in the near future. Currently a 3 TeV stage is considered viable as a post HL-LHC facility.

The physics potential of muon colliders has been investigated quite extensively over the past two years as a viable path toward the high-energy, high-luminosity frontier beyond the expected reach, despite the challenges to produce bright muon beams and mitigate the drawbacks arising from the short muon lifetime at rest.

The status of the project, future plans and synergies will be discussed.

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