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Prospects on Muon Colliders

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In the framework of the European Strategy Update on Particle Physics, the working group appointed to review the Muon Colliders has become the de facto seed of an on-going international effort. A muon collider, if demonstrated to be feasible, is a unique discovery machine and the best tool to fully study the Higgs potential, since it can offer collisions of point-like particles at very high energies, significantly surpassing the energy reach of other lepton colliders. It can even match the discovery potential of a proton collider with much higher energy, since the muon collision energy is fully available at the constituent level unlike for protons. The need for high luminosity faces technical challenges which arise from the short muon lifetime at rest and the difficulty of producing large numbers of muons in bunches with small emittance. Addressing these challenges requires the development of innovative concepts and demanding technologies, exploiting synergies with other new accelerator projects. A plan to launch the studies for a vigorous and conclusive R&D programme has been presented and is under discussion. A well-focused international community will be required to exploit existing key competencies and to develop such a novel and promising project for the future of High Energy Physics.

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Secondary track (number)

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