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Projet de futur collisionneur au CERN et stratégie européenne

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The European Strategy for Particle Physics is the foundation of Europe's long-term decision-making in the field. Mandated by the CERN Council, it is developed through broad consultation with the particle physics community. In March 2024, the Council initiated the process for the third update of the Strategy, following previous updates in 2013 and 2020.

The 2026 Strategy update aims to define a plan that will significantly advance our understanding of fundamental physics through the realization of CERN's next flagship project. This plan should identify the preferred option for the next collider at CERN, along with prioritized alternatives to be pursued should the primary option prove unfeasible or uncompetitive.

The 2020 Strategy recommended exploring the technical and financial feasibility of a future hadron collider at CERN with a centre-of-mass energy of at least 100 TeV—corresponding to parton centre-of-momenta of the order of 10 TeV—and an electron–positron Higgs and electroweak factory as a possible first stage. This led to the launch of the Future Circular Collider Feasibility Study, which has recently been completed.

Other proposed Higgs factories include two linear collider projects (CLIC and LCF) and a circular collider designed for installation in the existing LHC tunnel (LEP3). A Muon Collider could also access parton centre-of-momenta O(10 TeV), though its feasibility still requires substantial R&D. The proposal for an electron–proton collider, based on an Energy Recovery Linac (ERL) colliding an electron beam with the LHC proton beam, has been also submitted.

The presentation will briefly review the above proposals after a short introduction of the European Strategy for Particle Physics.

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