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Future high-energy collider options and physics prospects

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In 2012 the Large Hadron Collider, at CERN, Geneva, Switzerland, discovered a new type of particle, a Higgs Boson, which is anticipated to have played a crucial role at the beginning of the Universe, giving mass to the elementary particles. This paradigm shifting discovery was made by large experimental collaborations analysing the data of the LHC collected in the years 2011 and 2012. It has given directions to the next questions which are important to study for a deeper understanding of the fundamental particles and interactions in the coming future. In this overview we will discuss what the next physics goals of the LHC are, and present the current thinking and initiatives for new scientific instruments that will go beyond the capabilities of the LHC, such as a very large energy proton collider with centre of mass collisions at 100 TeV, and circular or linear electron-positron colliders that could operate as Higgs factories and more.

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