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HEP: current perspectives and future challenges

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Over the past 40 years, the Standard Model (SM) of elementary particles and their interactions has been providing an unfailing and remarkably accurate description of all experiments with and without high-energy accelerators. With the discovery of the Higgs boson at the Large Hadron Collider in 2012, the SM is now complete, and we believe that we understand the physics of the very small up to energy scales of $O(100)$ GeV. Nevertheless, the very existence of the Higgs boson, a particle like no other, gives rise to several new pressing questions that range from its true nature to its couplings to all other particles and the potential existence of New Physics. Along with the ever-present mystery of the nature of Dark Matter and the puzzles presented by the existence of particle flavors, there is fertile ground for new discoveries, both by theory and by experiment. The talk will present a broad-brush picture of how we have arrived at the current state of the field, followed by an overview of current and upcoming work, as well as some longer-term prospects for pushing the current frontier of knowledge in particle physics.

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