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Introductory course: Higgs

This lecture will provide a general overview of Higgs physics, from basics to some of the big questions of modern research around the Higgs boson at the LHC and future experiments.

We will start with an introductory review of the Brout-Englert-Higgs mechanism and electroweak symmetry breaking. Next, we will see how the Higgs boson relates to many of the deficiencies of the Standard Model (our current best description of Physics at high energies, but which we know to be only an effective theory of some more complete theory of Nature), and therefore constitutes a crucial tool to probe Physics beyond the Standard Model. We will discuss in particular properties of the Higgs boson that can be accessed experimentally –its mass, decay widths, trilinear self-coupling, etc. –and what can be learnt from them. Finally, we will consider the relation between the Higgs sector, the dynamics of the electroweak phase transitions, and the evolution of the early Universe.