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Advanced course: Higgs

Wednesday 7 February 2024 13:30 (1h 15m)

This lecture will provide an overview of some of the main questions of modern research around the Higgs boson at the LHC and future experiments.
A first part of the lectures will discuss the crucial role of the Higgs boson to probe Physics beyond 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). In particular, we will review a number of deficiencies of the Standard Model –hierarchy problems, matter-antimatter asymmetry of the Universe, dark matter, inflation, etc. –and how these relate to the Higgs sector. Next, we will consider 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.

Presenter: BRAATHEN, Johannes (T (Phenomenology))