T 127: Invited Overview Talks 6

Time: Friday 11:45–12:45 Location: Geb. 30.95: Audimax

Invited Overview Talk T 127.1 Fri 11:45 Geb. 30.95: Audimax

Status and Highlights of Higgs Boson Measurements and Searches at the LHC — •Marcel Rieger — Institute of Experimental Physics, Hamburg University, Germany

The Higgs boson, a cornerstone in our understanding of the Standard Model of particle physics, plays a pivotal role in imparting mass to elementary particles. 12 years after its discovery by the ATLAS and CMS collaborations at the LHC, and 60 years after the initial postulation of electroweak symmetry breaking, we can now reflect on a comprehensive set of findings in the Higgs sector. Years of data taking and meticulous analysis have provided deep insight into its properties and interactions, hitherto indicating, within experimental and theoretical uncertainties, agreement with SM predictions. Enhanced sensitivity resulting from continued collision data taking, along with advancements in theory, instrumentation, and analysis techniques, will ultimately pave the way for even more precise measurements and searches for new postulated phenomena, such as Higgs boson self-coupling. Focusing on the run 2 dataset, this talk aims to offer a broad overview of the latest results released by the ATLAS and CMS experiments, and provides a glimpse into the future of Higgs physics at the LHC.

Invited Overview Talk T 127.2 Fri 12:15 Geb. 30.95: Audimax

Charting the unknown: results from recent searches for new phenomena at the LHC — •Katharina Behr — Deutsches Elektronen-Synchrotron DESY, Notkestr. 85, 22607 Hamburg

A wide variety of searches at the LHC target new particles and interactions not described in the Standard Model of Particle Physics (SM). These are postulated to address the open questions of particle physics, such as the hierarchy problem, the origin of the baryon asymmetry in the universe, or the nature of dark matter, which the SM fails to answer. In the absence of evidence for new phenomena in the data analysed to date, new analysis strategies are needed to explore previously inaccessible kinematic regimes and provide sensitivity to signatures too subtle or exotic to have been picked up by previous searches.

In this talk, I will review results of recent searches for new phenomena conducted by the ATLAS and CMS Collaborations on their full LHC Run-2 datasets, highlighting new experimental techniques that allow us to explore previously uncharted regions in the vast landscape of new signatures and models beyond the SM. I will also give a brief outlook on the potential of searches on data from the on-going LHC Run 3.