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Physics of the Higgs Boson: Developing Broad Understanding in the Post-Discovery Era¹

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The discovery in 2012 of a Higgs boson at the ATLAS and CMS experiments was a pivotal moment in the decades-long pursuit of understanding the mechanism behind electroweak symmetry breaking. The focus of subsequent studies at the LHC has been the characterization of this recently-discovered particle through precision measurements of its couplings, spin, width and other properties. This characterization campaign is crucial in understanding whether this Higgs boson is consistent with the predictions of the standard model or is a harbinger of new physics. Further, direct searches for exotic Higgs production mechanisms or rare Higgs decays could reveal yet-unseen dynamics that are important for understanding the remaining open questions in particle physics. In this talk I will summarize the state of Higgs physics from the experimental perspective, focusing on results from the LHC Run 1 and with an eye towards what could be in store in Run 2.

¹Collaborations - CMS, ATLAS