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W.K.H. Panofsky Prize: The Long Journey to the Higgs Boson: CMS

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There has been a rich harvest of physics from the experiments at the Large Hadron Collider (LHC). In July 2012, the ground-breaking discovery of the Higgs boson was made by the ATLAS and CMS experiments. This boson is a long-sought particle expected from the mechanism for spontaneous symmetry breaking in the electro-weak sector that provides an explanation of how elementary particles acquire mass. The discovery required experiments of unprecedented capability and complexity. This talk, complementing that of Peter Jenni, will trace the background to the search for the Higgs boson at the LHC, the conception, the construction and the operation of the CMS experiment, and its subsequent discovery of the boson. The SM is considered to be a low energy manifestation of a more complete theory – physics beyond the SM is therefore widely anticipated. Selected CMS results will be presented from the search for physics beyond the SM from the 13 TeV Run-2 at the LHC.