# 64.4: The Higgs Boson

A key piece of the Standard Model is Higgs field, which is responsible for giving particles their mass. The Higgs field fill all of space, even in places where there would otherwise be a vacuum. The degree to which a particle interacts with the Higgs field determines its mass: particles interacting weakly with the Higgs field are light, while those that interact strongly with the Higgs field are heavy. Particles that don't interact with the Higgs field at all, like the photon, are massless.

The Standard Model predicts that fields that fill all space should be associated with a particle - for example, as we've seen each of the four fundamental forces is associated with a vector boson particle. [1] The particle associated with the Higgs field is the Higgs boson. The Higgs boson was detected experimentally at the CERN particle physics accelerator [2] in 2015, thus confirming the existence of the Higgs field and giving increased confidence in the Standard Model. [3]

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[1] Except, perhaps, for gravity. [2] CERN stands for Conseil Européen pour la Recherche Nucléaire, and is a facility located on the border between France and Switzerland. [3] See http://www.nobelprize.org/nobel_pri...sprize2013.pdf

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