Other files referencing Higgs boson:

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Higgs Phenomena

The Higgs phenomena traces back to 1964, when several physicists independently dreamed up the idea of an energy field that would have permeated the early universe (and persisted to the present). Peter Higgs, of the University of Edinburgh, and others realized that once the universe cooled enough from its initial Big Bang, this energy field would have had to emerge. Like a puddle of molasses, the field resists the motion of particles moving through it. Such resistance to motion, or inertia, is the defining quality of mass. Subatomic particles therefore acquire differing amounts of mass depending on how strongly they interact with the energy field.

The existence of the Higgs field also required a new particle — the Higgs boson.

https://www.sciencenews.org/article/higgs-found?gclid=CLeWvLScpbECFeUaQgodO0tJjg

Ie, the Higgs particle accounts for the mass of other particles, otherwise the existence of the property of mass cannot be accounted for in the **Standard Theory**. A candidate for the Higgs particle was announced on July 4th 2012, five decades after it's original prediction.

Scientists will have to look at how the Higgs decays - or transforms - into other, more stable particles after being produced in collisions at the LHC.

Dr Pippa Wells, a member of the Atlas experiment, said that several of the decay paths already showed deviations from what one would expect of the Standard Model Higgs.

For example, a decay path where the Higgs transforms into two photon particles was "a bit on the high side", she explained.

These could get back into line as more statistics are added, but on the other hand, they may not.

http://www.bbc.co.uk/news/world-18702455 july 4 2012

The December signal was no fluke, the scientists said Wednesday. The new particle has a mass of about 125.3 billion electron volts, as measured by the CMS group, and 126 billion according to Atlas. Both groups said that the likelihood that their signal was a result of a chance fluctuation was less than one chance in 3.5 million, "five sigma," which is the gold standard in physics for a discovery.

So far, the physicists admit, they know little about their new boson. The CERN results are mostly based on measurements of two or three of the dozen different ways, or "channels," by which a Higgs boson could be produced and then decay.

There are hints, but only hints so far, that some of the channels are overproducing the boson while others might be underproducing it, clues that maybe there is more at work here than the Standard Model would predict.

http://www.nytimes.com/2012/07/05/science/cern-physicists-may-have-discovered-higgs-boson-particle.html?pagewanted=all july 4 2012

Now that the Higgs has almost certainly been found, scientists are looking forward to learning more about it. So far, the particle seen in the experiments looks like the Higgs as predicted by the standard model, Heuer said, but slight differences could still exist. He compared the task to trying to determine from afar if a person approaching is your best friend or your best friend's twin. Only when the person gets close enough can you determine which one it is. LHC measurements should soon reveal whether the particle's properties match those predicted by the standard model, or whether new physics might be at work.

"Confirmation of theory is satisfying, but it would be more eventful if there were significant disagreements and controversies to resolve," said Frank Taylor, an MIT physicist who works on the ATLAS collaboration.

One well-loved extension of the standard model is a theory known as supersymmetry, which holds that all known particles have a heavy supersymmetric partner as yet unseen. The concept opens up all sorts of areas to explore. Some versions of supersymmetry, for instance, predict that at least five kinds of Higgs boson should exist, although only the lightest would be detectable at the LHC. Other supersymmetric particles may account for dark matter, the mysterious stuff that makes up most of the matter in the universe but which scientists have yet to identify.

http://www.sciencenews.org/view/generic/id/341993/title/Higgs_found?gclid=CLeWvLScpbECFeUaQgodO0tJjg July 28

Meanwhile, some devil's advocates have also argued that the discovery of the Higgs Boson may not live up to all the hype, at least not anytime soon. Chief among these skeptics is Columbia University Mathematical Physicist Peter Woit, a critic of string theory who told Big Think this discovery won't have any practical implications in your life—for now.

Although the video interview with Woit is not impressive, Woit is the author of the book *Not Even Wrong: The Failure of String Theory* and *the Search for Unity in Physical Law*, with 4 out of 5 stars from 51 reviewers, including physicists, at Amazon.com

http://bigthink.com/re-envision-toyota-blog/god-particle-or-hype-particle-what-the-higgs-boson-means-to-you