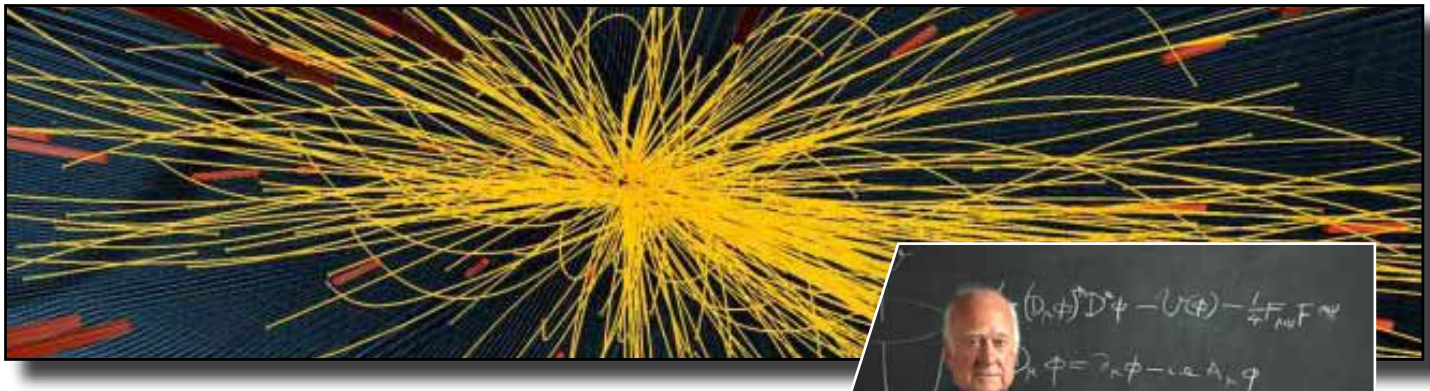
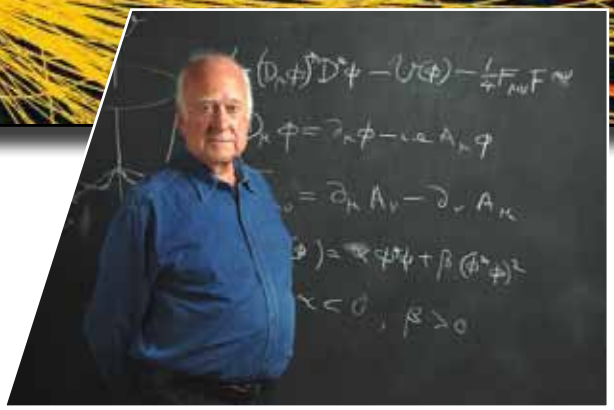
Higgs boson

On July 4th 2012, scientists from CERN announced the discovery of the Higgs boson, a fundamental particle first predicted almost 50 years earlier.

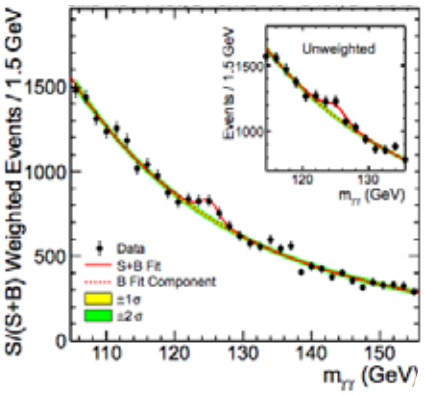


A particle collision recorded by CMS, one of two experiments at CERN, the European Centre for Nuclear Research.



A short life

When a Higgs boson appears, it decays rapidly into a host of other particles – within about 10^{-22} s. It is these particles which scientists detect and measure, and which have provided the evidence which confirms the existence of the Higgs.



The small bump in the line of data points is the evidence for the existence of the Higgs boson, from the CMS experiment.

Making predictions

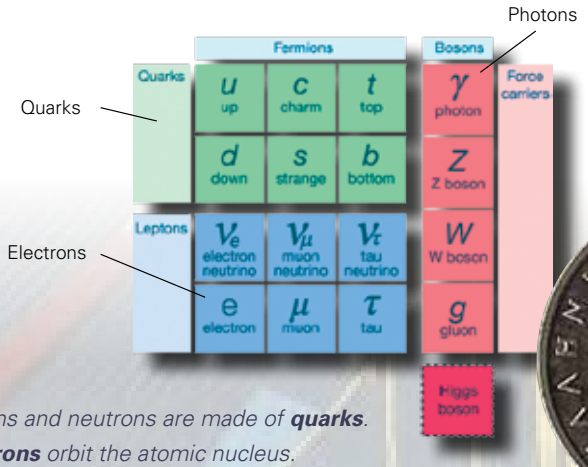
Professor Peter Higgs of Edinburgh University was one of six theoretical physicists whose work led to the prediction of the Higgs boson in 1964.

Higgs and mass

The idea is that the Universe is permeated by the Higgs field. Particles interact with the field as they moive through it, and this slows them down, giving them mass. It's a bit like wading through snow. The particles which interact most strongly with the field have the most mass.

One of a family

The Higgs boson is the last particle to be discovered in the 'Standard Model' – the set of fundamental particles which physicists believe can explain how matter behaves.



*Protons and neutrons are made of **quarks**.*
***Electrons** orbit the atomic nucleus.*
*Electromagnetic radiation is made up of **photons**.*

How certain?

If you tossed a coin three times and each time it came down heads, you wouldn't claim that it was a double-header. Get heads 21 times in a row and you would be almost certain – that's how sure the CERN scientists are that they have found the Higgs boson.