

# Questions for the 21st Century

1) Do particles acquire their mass through the Higgs field ?

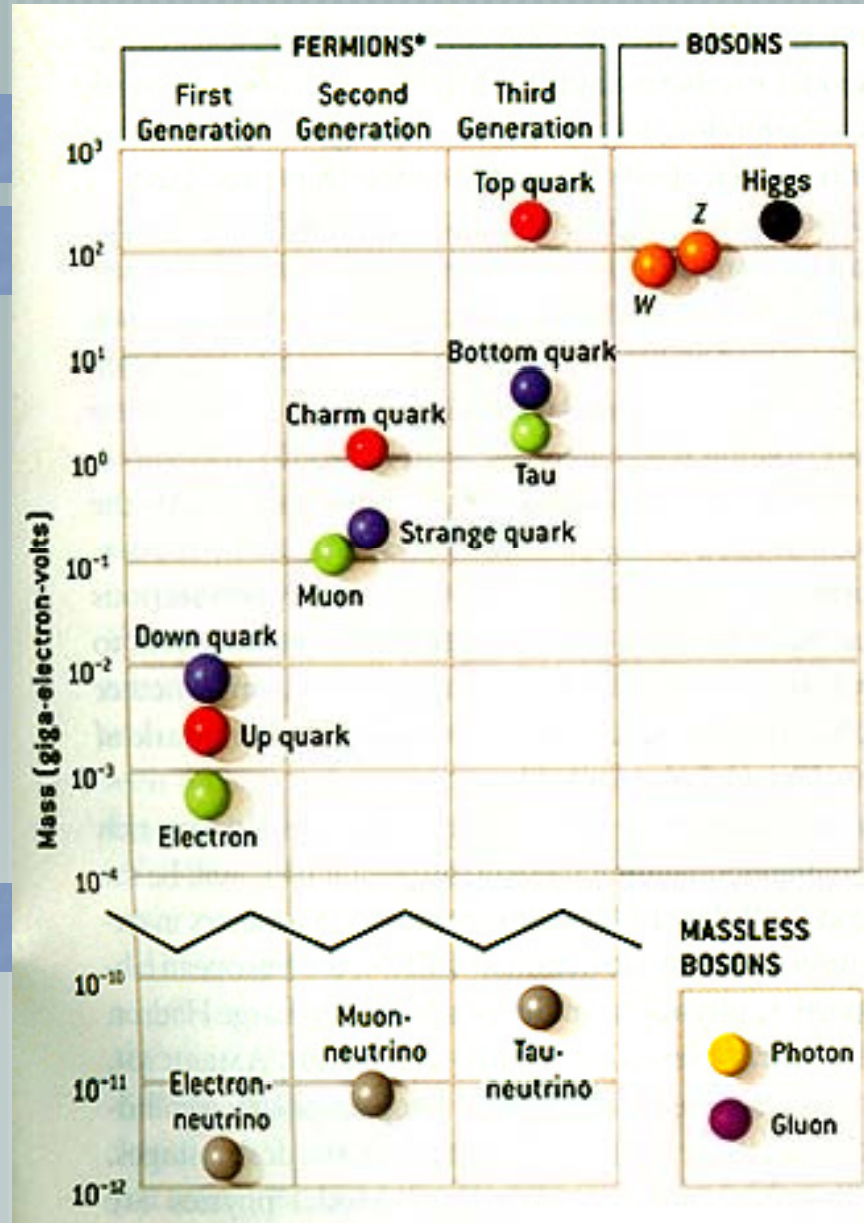
1 TeV →

100 GeV →

1 GeV →

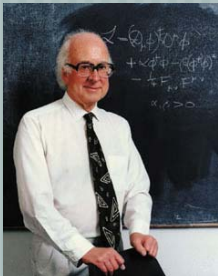
1 MeV →

0.01 eV →



# Questions for the 21st Century

## What is so special about the Higgs field?



It permeates the entire Universe since the Big Bang

It gives particles their precise masses (also newly created ones)

It is like a 'cosmic DNA', storing the information about the particle spectrum

Sir Peter Higgs



At a cocktail party ...

*The Higgs field ...*



.. a celebrity enters and wants to go across the room...

*... A new particle is created ...*



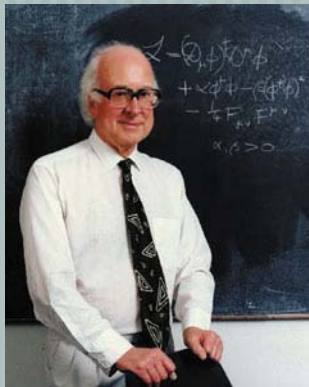
.. but the party guests cluster around him and want autographs...

*... which acquires mass through the interaction with the Higgs field ...*



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## The Higgs particle



Sir Peter Higgs



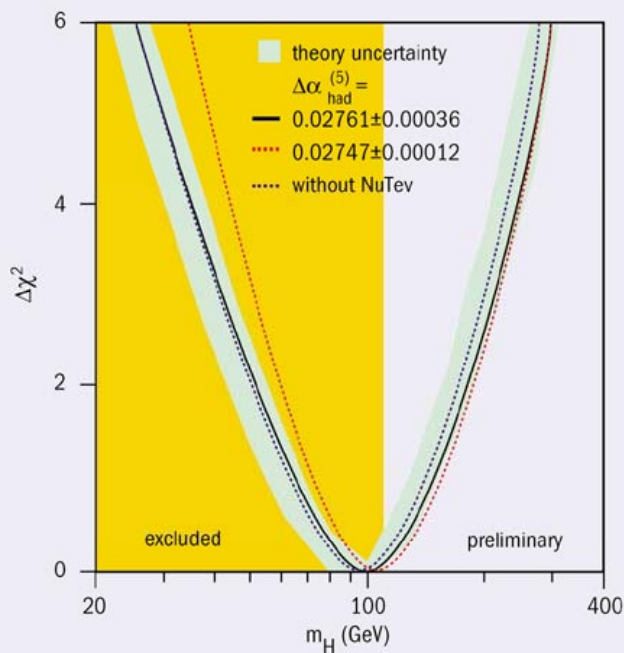
A rumour is spreading among the party guests ...



.. Which makes them cluster together ...

*The Higgs field ...*

*... has an excited state, which is the Higgs particle  
(analogy: e.m. field and photon) ...*



From precision measurements at LEP (sensitive to virtual Higgs particles), the mass of the Higgs particle is predicted to be in the 120-200 GeV region.