

[LHC video](#)

First 'fired up' on 10 September 2008

Higgs is thought to be the 'particle' that imbues matter with its mass – creates reality in the Universe.

It has been difficult to find – hence its moniker 'God' particle which comes from the phrase 'God-damn' particle.

The Higgs is part of the family of Bosons that includes the photons (these carry the electromagnetic force – force between charged particles eg electrons are attracted to protons due to the interchange of photons

and Gluons (these carry the strong nuclear force responsible for holding the particles together in a nucleus.

Other forces in the Universe are the weak force responsible for nuclear decay (W & Z particles) and Gravity (gravitons – if they exist!)

Protons, neutrons and electrons are Fermions

Very high energies are needed to create a Higgs – approximately 1 TeV ( $10^{12}$  eV). To achieve this protons and antiprotons are accelerated to speeds approaching the speed of light ( $300\,000\text{kms}^{-1}$ ) and collided into one another recreating the energies present in the Big Bang.

Particle	Typical Energy
Microwave	10 $\mu\text{eV}$
Visible	1 eV
X-ray	10 keV
electron	1 MeV
neutron	1 GeV