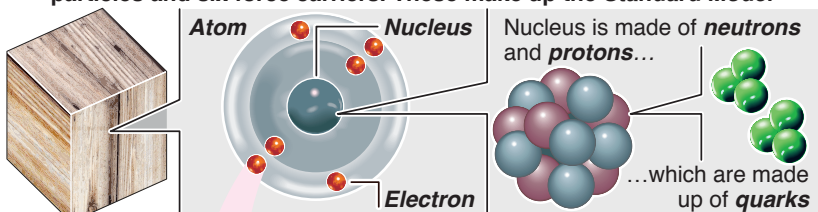


Standard Model – the theory of everything

Physicists believe that matter – everything created in the universe by the Big Bang some 14 billion years ago – is made up of 12 fundamental particles and six force carriers. These make up the *Standard Model*



Fundamental particles and forces (year of discovery)

LEPTONS

These particles exist on their own

Electron 1897
Electron neutrino 1956

Most matter on earth is made from these four particles

Muon 1937
Muon neutrino 1962
Tau 1975
Tau neutrino 1975

These eight particles – found in cosmic rays – came into existence in moments after Big Bang

QUARKS

Down 1977

Up 1994

Quarks only exist bound together

Strange 1947

Charm 1973

Bottom 1977

Top 1994

FORCE CARRIERS

Photon 1900

Z boson 1983

W+ boson 1983

W- boson 1983

Gluon 1979

Higgs boson Yet to be discovered