Physics Quiz - Subatomic Physics and Standard Model

Julia Abibe

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1

A photon is a has no mass in it.

2

The size of a quark ranges from:

$$10^{-35}m$$

to

$$10^{-15}m$$

3

First, an electric charge is the physical property of matter that causes it to experience force with when placed in an electromagnetic field. Meanwhile, color charge cannot be found individually, only confined in groups, called hadrons, with other quarks. These composites are color neutral.

4

A Boson is a particle that follows the Bose-Einstein statistics. It makes up one of the two classes of particles and two examples of it are protons and gluon. Also, more than one boson can occupy the same quantum space. Meanwhile, Fermions cannot, resulting in rigidity of matter. Fermions are said to be constituents of matter, while bosons are said to be particles that transmit interactions, or constituents of radiation.

5

A composite boson is a particle that is both a boson and a hadron. It is formed by two quarks, which gives the characteristics for it to be a hadron.

6

The purpose of a bubble chamber is to make the tracks of ionizing particles visible as a row of bubbles is a liquid. Therefore, it detects electrically charges moving.

7

There are three leptons with electrical charge and three without charge. Leptons are point-like particles without internal structure, such as electron and muon.

8

Two examples of leptons and electron and muon. Meanwhile, two examples of baryon are protons and neutrons.

9

First, a Feynman diagram is used to describe the particles interactions. The quantities conserved at each vertex are the baryon number and the lepton number. For this to happen the particles need to follow the conservation law.

10

Gluons are the exchange particles for the color force between quarks. The gluon can be considered to be the fundamental exchange particle underlying the strong interaction between protons and neutrons in a nucleus.