

THE QUARKS CUP

Lecture 1 Baryons, Mesons and Leptons

These are just titles for the various types of atomic particles.

Particles are grouped according to their SPIN.

Particles with INTEGER SPIN are called MESONS.

Particles with HALF-INTEGER SPIN are called BARYONS.

[Note: Integers are: ... -3, -2, -1, 0, 1, 2, 3]

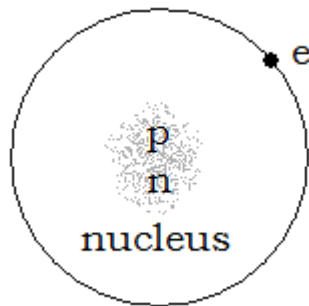
Leptons also have HALF INTEGER SPIN but do not take part in STRONG INTERACTIONS.

SPIN

The simplest model of the atom pictures electrons orbiting the nucleus.

This is known as Bohr's model.

p = protons, n = neutrons, e = electrons



Consider a planet orbiting the Sun. Not only does this planet rotate around the Sun, it also has its own spin. [For example, the Earth rotates around the Sun once a year, but it also spins round as it does so; once a day.]

In this case the planet's spin is known as the INTRINSIC SPIN.

Particles also have an INTRINSIC SPIN; but nothing in the everyday world can be compared to it; It is PURELY a quantum mechanical effect.

Unlike a planet that spins continuously, a particle has a FIXED spin value.

This value is a WHOLE NUMBER (or zero) for a particle which is a BOSON.

But the value is ONE HALF of a whole number for a particle which is a FERMION.

Example

An electron is a FERMION because it has spin 1/2.

Also, because it does not take part in STRONG INTERACTIONS, it is classed as a LEPTON.