Fundamental Forces and Structure of Matter

by

Lancelot L. Kao
Fundamental Forces

- Gravitational Force
  - interaction between matter

- Electromagnetic Force
  - interaction between charges

- Weak Nuclear Force
  - “regulation” of nuclear decay

- Strong Nuclear Force
  - “binding” force of matter
Range of Fundamental Forces

- **Gravitational Force**
  - infinite

- **Electromagnetic Force**
  - infinite

- **Weak Nuclear Force**
  - within nucleus \((10^{-14}m)\)

- **Strong Nuclear Force**
  - within nucleus \((10^{-14}m)\)
Carriers of Fundamental Forces

- **Gravitation Force**
  - gravitons

- **Electromagnetic Force**
  - photons (light)

- **Weak Nuclear Force**
  - W, Z^+, Z^- bosons

- **Strong Nuclear Force**
  - mesons & gluons
Structure of Matter

- Atom consists a nucleus surrounded by an electron cloud.
- The nucleus is made up of protons and neutrons.
- An atom has the same number of electrons and protons.
- Protons and neutrons are made up of smaller particles called quarks.