

## Fundamental forces in Nature

### Gravitational Force

“It is the force of mutual attraction between any 2 objects by virtue of their masses.”

Properties:

1. It is a universal attractive force
2. It is the weakest force in nature
3. It operates over long distances
4. It is central and conservative.
5. It obeys inverse square law
6. Field particle : Graviton

### Weak nuclear force

“It is the force of interaction between elementary particles of short life times.”

Properties:

1. It is  $10^{25}$  times stronger than gravitational force
2. Field particle : lepton

### Electromagnetic Force

“It is the force between charged particles”

Properties:

1. It can be attractive or repulsive.
2. It is  $10^{36}$  times stronger than gravitational force
3. It operates over distances which are not very long.
4. It is central and conservative.
5. It obeys inverse square law
6. Field particle : Photon

### Strong Nuclear Force

“It is the force that binds the protons and neutrons together in the nucleus”

Properties:

1. It is basically attractive in nature (If the distance between nucleons is less than 0.5 fermi it becomes repulsive).
2. It is the strongest force in nature ( $10^{38}$  times stronger than gravitational force)
3. It operates over very short range.
4. It is non-central and non-conservative.

5. It do not obey inverse square law
6. Field particle :  $\pi$ -meson

