

Fundamental forces of nature

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Fundamental forces of nature - their characterization strength and range

A force can be defined as the push or pull on an object that causes it to change its state of rest or uniform motion. There are four fundamental forces in nature which are **Gravitational force**, **Strong force**, **Weak force** and **Electromagnetic force**. These forces prevent the drifting of matter in the universe and helps keep it together.

Gravitational Force: This force is the weakest but has an infinite range. It has strength of 6×10^{-39} in comparison to the strength of the strong force. This force is always attractive acts between any two pieces of matter in nature. The effect of this gravitational force is dependent upon the mass of the two bodies and the distance between them.

Strong force: This force holds the nucleus of an atom together. It is the strongest of the forces, but it is very short ranged. It acts over a range of about 10^{-15}m , which is the average diameter of a medium sized nucleus. This force is attractive.

Weak Force: This force is weak compared to the strong force as the name implies and has the shortest range of 10^{-18}m , which is 0.1% of the diameter of a proton. It is responsible for radioactive decay especially nuclear beta decay. All particles experience this force.

Electromagnetic Force: This is the second strongest force after the strong force and it acts on electrically charged particles. It has strength of 1/137 relative to the strong force but has an infinite range. However, this force has both attractive and repulsive properties due to the two charges it possesses; negative and positive. Like charges repel while unlike charges attract and this can be demonstrated with a simple magnet or electric charges.

References

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