The four fundamental interactions" forces" in nature

As you sit in front of your computer reading this , you may be unaware of the many forces acting upon you. In physics 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 . All the known forces of nature can be traced to these fundamental interactions.

The **Gravitational Force** acts between any two pieces of matter in the Universe since mass is its source, whether they be stars, microscopic particles or any other bodies with mass. It pulls you down into your seat, toward the Earth center. You feel it as your weight. By far, it is the weakest of the four fundamental forces . Not to mention, It was approximately described by Sir Isaac Newton's Law of Universal Gravitation in 1687, and more accurately described by Albert Einstein's General Theory of Relativity in 1916 .

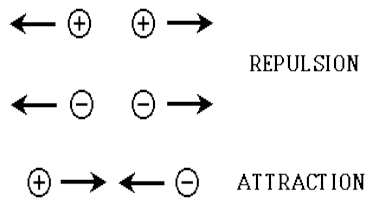
The electromagnetic force acts between the electrically charged protons and electrons inside atoms. It is essentially responsible for gluing together all ordinary matter. In other words, it holds the atomic particles and molecules together. In fact, the forces of electric attraction and repulsion of electric charges are so dominant over the other three fundamental forces. It is (10^{42} times) hugely stronger than the force of gravity .

The strong nuclear force in fact is the strongest of the four known forces. Its main job is to hold or bind protons and neutrons together in the nucleus of an atom despite the electromagnetic repulsion of the positively charged protons for each other which tends to push them apart, but the nuclear force is strong enough to overcome this repulsion . Then allows those sub- atomic particles to bind into atomic nuclei .

While the other forces hold things together, **the weak force** plays a greater role in things falling apart, This type of force is experienced by protons and neutrons in the heavy nucleus of atom, where a neutron within the nucleus changes into a proton and an electron, which is ejected from the nucleus. This is responsible for radioactive decay, specifically, beta decay(β-decay). It is weaker than the strong force .

The four forces that govern all matter in the universe are often described according to their relative strengths. The strong force is regarded as the most powerful force in nature and plays an essential role in storing energy that is used in nuclear power . It is followed by the electromagnetic force which can be attractive or repulsive. Electricity, magnetism, and light

are all produced by this force. The weak force that is responsible for much of the natural radiation present in the universe , and keeps our sun bright and warm. Lastly, the gravitational force that regulates the motion of planets and stars.



Text exploration – Before reading:

1- According to you, what are the fundamental forces that govern nature?
2- How many paragraphs does the text consist of?

Text exploration :

3- Read the text slowly and silently.
4- Extract the difficult words from each paragraph. Use your dictionary to define the underlined words

5- Find in the text words which are synonyms and antonyms

6- Are these statements: true, false, or not mentioned?
   a) The weak force is regarded as the second powerful force in nature.
   b) The strong force prevents repulsion of the positively charged protons in the atom
   c) . The weak nuclear force is the weakest force in nature

7- Answer the following questions according to the text:

- What is the role of each of the four forces ?
- What would happen if the strong nuclear force did not exist?
- How do repulsion and attraction happen?
- According to your previous knowledge, what is the relativity theory ?

Grammar exploration :

- Find in the text some examples of comparative and superlative forms