Physical World

1. Physics deals with the study of the basic laws of nature and their manifestation in different phenomena.

2. **Gravitational Force**

   It is the force of mutual attraction between any two objects by virtue of their masses. It is a universal force. It plays a key role in the large-scale phenomena occurring in the universe, such as formation and evolution of stars, galaxies and galactic clusters.

3. **Electromagnetic Force**

   Electromagnetic force is the force between protons is 10^{36} times the gravitational force between them, for any fixed distance.

   It is mainly the electromagnetic force that governs the structure of atoms and molecules

4. **Strong Nuclear Force**

   The strong nuclear force binds protons and neutrons in a nucleus. The strong nuclear force is the strongest of all fundamental forces, it is charge independent and acts equally between a proton and a proton, a neutron and a neutron, and a proton and a neutron. Its range is, extremely small, of about nuclear dimensions (10^{-15}m). It is responsible for the stability of nuclei.

5. **Weak Nuclear Force**

   The weak nuclear force appears only in certain nuclear processes such as the $\beta-$decay, the nucleus emits an electron and an uncharged particle called neutrino. The weak nuclear force is not as weak as the gravitational force, but much weaker than the strong nuclear and electromagnetic forces. The range of weak nuclear force is exceedingly small, of the order of 10^{-16} m.

6. **Nature of Physics Laws**

   The physical quantities that remain unchanged in a process are called conserved quantities. Some of the general conservation laws in nature include the laws of conservation of mass, energy, linear momentum, angular momentum, charge etc. some conservation laws are true for one fundamental force but not for the other. Conservation laws have a deep connection with symmetries of nature. Symmetries of space and time,

and other types of symmetries play a central role in modern theories of fundamental forces in nature.

7. Sir C.V. Raman (1888-1970)

The Raman Effect deals with scattering of light by molecules of a medium when they are excited to vibration energy levels.

8. Satyendra Nath Bose (1894 - 1974)

Bose gave a new derivation of Planck's law, treating radiation as a gas of photons and employing new statistical methods of counting of photon states. An important consequence of Bose-Einstein statistics is that a gas of molecules below a certain temperature will undergo a phase transition to a state where a large fraction of atoms populate the same lowest energy state.