What is Motion in Physics?

In physics, motion is that phenomenon during which an object changes its position over time. Motion is calculated or described in terms of distance, velocity, displacement, acceleration, speed, and time. The motion of a body is observed by attaching a frame of regard to an observer and measuring the change in position of the body relative thereto frame with the change in time.

When an object doesn't change its position relative to a given frame of reference, the thing is said to be at rest, motionless, stationary, or time-invariant position with regard to its surroundings. Motion is present everywhere, in various physical systems: like matter particles, matter fields, bodies, radiation, radiation fields, radiation particles, curvature and space-time.

Laws of Motion

In physics, two related sets of laws of mechanics describe the motion of massive bodies. Newton law of mechanics describes the motions of all large-scale and familiar objects within the universe (such as cars, projectiles, planets, cells, and humans). On the other side, Quantum physics describes the motion of very small atomic and sub-atomic objects. Together, Newton and Euler made three laws of classical mechanics:

First law – In an inertial coordinate system, an object either remains at rest or continues to manoeuvre at a continuing velocity, unless acted upon by a net force.

Second law – In an inertial coordinate system, the resultant of the forces F on an object is adequate to the mass m of that object multiplied by the acceleration an of the object: F = ma.

If the resultant force F working on a body or an object doesn't equal to zero, the body will have an acceleration a which is within the same direction because the resultant.

Third law – When one body A, exerts a force on a second body B, then the second body B simultaneously exerts a force of equal magnitude but opposite in direction on the first body A.