

Special Theory of Relativity

Introduction:- Special theory of relativity is a fundamental physics theory about space and time developed by Albert Einstein as a modification of Newtonian physics. Phenomenon of interference, diffraction and polarisation demonstrate beyond doubt, that light has wave nature.

In lower classes, it is taught that a material medium is required for waves to travel.

We also know that light (wave) reaches us from sun ~~to~~ although there is vacuum from sun to 400 km above the surface of earth.

Huyghens in order to stick to his wave theory and yet explain the arrival of light from sun to earth assumed that there is a hypothetical medium called aether which is all pervading. Our planets and galaxies move in universe, through all pervading aether. If that were true, then aether should act as ~~a~~ ~~solid~~ medium, which is at absolute rest. Motion of earth w.r.t. aether should then be absolute motion. In order to detect the absolute motion of earth and aether, Michelson ~~and~~ Morley performed an experiment and proved beyond doubt that aether did not exist.

Maxwell later proved ^{theoretically} (using Maxwell's equations of e.m. waves) that light was e.m. wave and did not require material medium to travel. (Material medium is required only for mechanical waves such as sound waves, water waves, spring waves etc).

Rejecting the concept of absolute motion, Einstein assumed that "everything is relative."