

As space and time

Basic Definitions

Events are physical phenomena that occur independent of any reference frame. For example, a flash explosion, return of a spaceship, or disintegration of a subatomic particle.

observers - record events both the time and spatial co-ordinates in a particular reference frame. For example Mission control in Houston marking

down the time and location of the splashdown of a space capsule. The reference frame in this case is the Earth.

Simultaneous events \rightarrow

occur when the light signals from two events reach an observer at the same time.

Relativity of simultaneity \rightarrow

Two events simultaneous in one inertial frame are not simultaneous in any other frame. This is a consequence of Einstein's Postulates.

Proper time is the difference between two events occurring at the same position denoted by $(t_0$ or τ)

Rest frame is the inertial frame where two events are only separated by time. The frame in which the proper time is measured.

Proper length is the distance between two positions at rest, the length measured in the rest frame. (denoted by L_0)

Now that we are armed with these definitions let's explore the consequences of the constancy of the speed of light in all inertial frames.