

Relativity

May 29

relativity states that

- Time is not a constant and depends on how fast your are moving.
- Distance traveled is shorter based on how fast you are moving.

Observations

Observations depend on how the observer views the world. This is called their frame of reference

How is the frame of reference of somebody on a bus different from someone that isn't moving?

What is an Inertial frames of reference?

Where the observer and it's surroundings are at a constant velocity.

Do all laws of motion hold true in an inertial frame of reference? Can you tell (without outside information) if you are moving or not?

How can two inertial frames be related

inertial frames can be related with velocity



Figure 1: Albert

What is the first postulate of Einstein

are the laws of physics the same in all inertial frames of reference?

can you determine if you are at rest or at a constant velocity?

Postulate 2?

- is the speed of light constant?

Time dilation?

if c is constant but the apparent distances are different then time also needs to be different

time observed by the moving party tho the stationary party is given by the Lorentz factor

$$\frac{\Delta t_{moving}}{\Delta t_{stationary}} = \gamma$$

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

γ is the ratio between the times of inertial frames of reference

What is proper time?

from the person who did not accelerate within the times in question

the difference is that the person in the spaceship did not stay in their initial inertial reference frame, the person on earth stayed in their reference frame, so the 'clock' is the proper time.

Read

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read 11.2

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