

Re: Einstein ever defined TIME?

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From: Henri Wilson (H_at_..(Henri))

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On Fri, 22 Oct 2004 14:54:12 +0200, "Paul B. Andersen" <paul.b.andersen@hia.no> wrote:

>> >> >> >Henri Wilson wrote:

>> >> >> >> As far as I know, I am the only person who has ever provided a decent
>> >> >> >> definition of time.

>> >> >> >>

>> >> >> >> Time, like space, is a basic dimension by which we describe events in the
>> >> >> >> universe.

>> >> >> >> It has three subdimensions, the ratios of which allow concepts like 'timeflow'
>> >> >> >> to have a noncircular meaning.

>

>[..]

>

>"Henri Wilson" wrote:

>> "Paul B. Andersen" wrote:

>> >"Henri Wilson" wrote:

>> >>"Paul B. Andersen" wrote:

>> >>>I snap my fingers twice.

>> >>>I challenge you to explain how to measure the "time"

>> >>>between those two events, where "time" is according

>> >>>to your definition.

>> >>>

>> >>>>Remember, this is a physics NG, and we are only

>> >>>>interested in definitions of concepts which can be

>> >>>>used in physics.

>

>[..]

>

>> >> To measure the time interval between the snapping of your fingers (twice) you
>> >> use a clock. You arrange for its rate to be fixed wrt a certain stable

>> >> periodicity, such as the rotation of Jupiter, then you arrange for the snapping

>> >> of your fingers to firstly start the clock and then stop it.

>> >

>> >>How do you from your definition above conclude that

>> >>"a clock with a certain stable periodicity" measures "time"?

>>

>> A clock indicates time instant.

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- >> *A perfect clock will always read the 'time interval' after a certain arbitrary*
- >> *zero.*
- >
- >*So "a clock" is per definition an instrument which*
- >*measures "time" according to your definition.*
- >
- >*So the question is:*
- >*Is it possible to make a real, physical "clock",*
- >*at least in principle?*

No harder, in principle, than making a standard rod.

- >
- >> *It does this by integrating its own 'ticking rate', dt_2/dt_1 , wrt t_1 .*
- >> *In other words, it just adds up the number of ticks it makes.*
- >>
- >> *Unfortunately, no clock is perfect.*
- >
- >*You have missed the point completely.*
- >*Is there any reason whatsoever to think that any*
- >*natural repeating process will have a period*
- >*which is stable according to YOUR definition of "time"?*

A 'perfect clock' is unaffected by mechanical distortion, for instance due to its own weight.

There is no reason why a perfect clock should ever deviate from its calibrated rate no matter what happens to it.

- >
- >*There is nothing in your "decent" definition which say*
- >*that the amount of "time" should be equal for two different*
- >*cycles of – say a specific spectral line (or whatever).*

Yes there is. But it is only true in the source frame.

- >
- >*And there is nothing in your definition which says*
- >*anything about if the same natural process can*
- >*be assumed to take the same amount of "time"*
- >*everywhere in the universe.*

You raise an interesting question actually.

If time instant is universal, as I claim, then does this imply that time 'flow' is also constant everywhere?

- >
- >*So exactly how do you measure "time" in the real*
- >*physical world?*

You must specify time 'instant', 'interval' or 'rate of flow'.

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We refer to them all as just TIME but they are quite different.

To do anything associated with time measurement, one requires a standard unit of time INTERVAL. This can then be divided into small divisions against which time 'INSTANT' can be determined to the accuracy of the division size.

Then one can calibrate any number of clocks against that standard. We started out using the Earth's rotation as a standard but unfortunately, even this kind of thing will drift.

>
>*Paul*
>

HW.

www.users.bigpond.com/hewn/index.htm