

Re: Quick Speed of Light Question

Source: <http://sci.tech-archive.net/Archive/sci.physics.particle/2004-09/0461.html>

From: 10of100 (Greg_Balaze_at_hotmail.com)

Date: 09/27/04

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GoldenBoar <no@email.com> wrote in message news:<opsewu7sz709ix88@mabsmain>...

> On Sat, 25 Sep 2004 17:49:52 GMT, GoldenBoar <no@email.com> wrote:

>

>> On Fri, 24 Sep 2004 18:24:19 GMT, GoldenBoar <no@email.com> wrote:

>>

>>> If the speed of light in a vacuum is 299,792,458 m/s exactly, what is

>>> the

>>> speed of light in space and what factors are involved in its

>>> calculation?

>>>

>>>

>>> ---

>>> Outgoing mail is certified Virus Free.

>>> Checked by AVG anti-virus system (<http://www.grisoft.com>).

>>> Version: 6.0.766 / Virus Database: 513 - Release Date: 17/09/2004

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>>>

>>

>> This was supposed to be a quick and easy question, but either the

>> question is too difficult or you guys think it stupid. For those in the

>> latter category, space is not a vacuum remember. A vacuum should have a

>> temperature of 0 K, space has a temperature of 2.7 K.

>>

>> So i guess what I am really asking is the difference in speed caused by

>> a temperature of 2.7 K.

>>

>> After searching the internet unsuccessfully for an answer, this speed was

>> referred to as both the speed of light in a vacuum and in space.

>>

>> Is this a measurement of the speed of light in a vacuum, or the speed of

>> light in space?

>>

>> Could someone please answer this question, which I thought would be easy

>> for you guys.

>>

> For anyone wondering about this, I found an equation on Wikipedia:

>

> $E=kcT$

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- >
- > *where E is the Energy*
- > *k is the Boltzmann Constant*
- > *and T is the Temperature*
- >
- > *From this, you can see that if $T=0$ then $E=0$. This tells us that the speed*
- > *of light in a vacuum is not 299,792,458 m/s, but is in fact 0, meaning*
- > *light cannot travel in a vacuum.*
- >
- > *If light cannot travel in a vacuum, why does the universe exist?*
- >
- > *If c is actually 0 in a vacuum, then the other vacuum properties are also*
- > *0.*
- >
- > *What is going on here? Is the above equation wrong? Are the equations*
- > *relating Planck's constant, frequency, wavelength, and the speed of light*
- > *wrong?*
- >
- > *Thanks for all your responses, they were so helpful to me.*

Boltzmann factor relates more to thermodynamics particularly the entropy of a body, ie. has mass. As far as I can tell it really does not relate to the velocity's.

Think of the speed of light in a vacuum to be the speed a photon is at when it's not encountering an atom or external field. A photon seems to slow down when it has to go from atom to atom in a transparent media, think of a photon as a bumper cars that has to bounce off of other cars to make it's way through to finish line, as compared to a car that is by itself. They can both be moving at the same speed, but since the one has all the other cars in its way, it tends to get to the finish last.