# Re: Eric Gisse doesn't know the basics of Relativity

***Source:*** http://sci.tech−archive.net/Archive/sci.physics.relativity/2007−08/msg00567.html


- *From*: Eric Gisse <jowr.pi@xxxxxxxxx>
- *Date*: Mon, 06 Aug 2007 22:51:15 −0000


On Aug 6, 4:57 am, "T.M. Sommers" <t...@xxxxxx> wrote:

> Eric Gisse wrote:
>
> > On Aug 5, 9:16 am, "T.M. Sommers" <t...@xxxxxx> wrote:
> >
> > > gu...@xxxxxxxxxxx wrote:
> > >
> > > > On Aug 5, 11:12 am, "T.M. Sommers"
> > > > <t...@xxxxxx> wrote:
> > > >
> > > > > Temperature is not
> > > > > invariant. It transforms as
> > > > >
> > > > > T' = T * (1 − v^2/c^2)^(1/2)
> > > > >
> > > > > Come on. Rest Mass is a Lorentz invariant
> > > > > scalar.
> > > >
> > > > Never heard of invariant mass, M' = gamma
> > > > M.
> > >
> > > M remains invariant.
> >
> > I thought we were talking about temperature. What has mass
> > got

> > to do with it?
>
> Nothing. He seems to believe that the kludge known as "relativistic mass" somehow invalidates my argument.
>
> This has been going on since April. He didn't understand then, and doesn't understand now as evidenced by his latest little temper tantrum. Every so often he has to spam this newsgroup with about 20 posts saying how stupid I am and whatever.
>
> http://groups.google.com/group/sci.physics.relativity/msg/8ec41d88e75...
>
> That is the argument for why temperature transforms as such.

I'm not so sure, anymore. Based on a quick search of arXiv, this seems to be an unsettled area of physics, with some saying

T' = T * (1 − v^2/c^2)^(1/2),

some saying

T' = T / (1 − v^2/c^2)^(1/2),

and some saying

T' = T.

See arXiv:gr−qc/9505045, arXiv:physics/0506214, and arXiv:physics/9610016, for instance.

gr−qc/9505045 : Assumes quantum field theory. Gives T' = gamma^3 * T. Cute...

physics/0506214 : Asks the important question: "What should be kept invariant under Lorentz transformation?!".

Different authors assume different things. For example, I follow Tolman and assume that /entropy/ is invariant. Shit, it makes sense to me. Why would you have different amounts of available particle states just because you are in a different reference frame? Other authors assume that temperature should remain invariant with the same type of

argument, then they discover that entropy transforms instead.

I agree that no consensus will be reached until there is some actual experimental evidence in one direction or the other.

physics/9610016 : Assumes quantum field theory...and finds that T' = T for a blackbody thermal spectrum. This was actually touched upon in gr−qc/9505045. I'd care more if I knew enough quantum field theory to understand exactly what was being done.

This may sound stupid, but the result you obtain depends very strongly on what you assume. QFT is not classical thermodynamics + SR, and the results of both heavily depend on your starting assumptions. All sorts of assumptions have a well−motivated physical basis, and none of them can be preferred until we have a little more understanding.

> That something so seemingly basic is still unsettled after 100 years suggests to me that there is something wrong with the question. I suspect, but cannot prove, that T does not transform at all (which is different from saying T' = T). I further suspect that this is because a system in equilibrium in one frame is not in equilibrium in another.

It doesn't surprise me at all to see that this is a somewhat complicated subject which does not have a clear consensus.

However, the whole discussion wasn't started on some well−meant academic debate. Back in APRIL [almost 4 fucking months ago] guskz made one of his latest spew threads in which he misunderstands yet another topic in physics. I was stupid, and tried to educate.

http://groups.google.com/group/sci.physics.relativity/browse_frm/thread/dd959050d1560e4

Eventually I end up pointing out that temperature is not a tensor because tensors are invariant and temperature transforms under a Lorentz transformation. Four months later, he is still pitching a shitfit. My original point stands − temperature is not a tensor.

[...]

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