

Re: Inflationary Theory ; I'm confused

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From: josephus (dogbird_at_earthlink.net)

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George Dishman wrote:

> "TomGee" <lvlus@hotmail.com> wrote in message

> news:1108743767.544269.163600@l41g2000cwc.googlegroups.com...

>

>>george@briar.demon.co.uk wrote:

>>

>>>TomGee wrote:

>>>>

>>>>George Dishman wrote:

>>>>>

>>>>>I'm not sure why you include the word "parallel". We

>>>>>live in a 4D universe, three dimensions describing space

>>>>>and one for time.

>>>>>>

>>>>>>

>>>>>

>>>>>Yes, I know, so why would AE make up another one just like ours? It

>>>>>boggled my imagination to think that he ignored the fact you just

>>>>>pointed out, and so did all the scientists who have mentioned his

>>>>>claim. Dumb, isn't it? Or maybe you know why he made up another one?

>>>>>I just assumed his was a parallel one to ours since he ignored our 4d

>>>>>universe.

>>>>>>

>>>>>If you are referring to GR then he didn't make up any

>>>>>other universe, it describes *our* universe. He didn't

>>>>>deal with any "parallel" universes AFAIK, certainly he

>>>>>didn't like QM and I doubt he would have liked the MWI.

>>>>>>

>>>>>Of course it's possible you are referring to some

>>>>>comments he made that I haven't yet come across. If so

>>>>>a pointer would be appreciated.

>>>>>>

>>>>>>

>>>>>I appreciate your point. I ascribed the term "parallel" on my own to

>>>>>his explanation of curved space as printed in several publications

>>>>>through the years. I never read where he said it was the same universe

>>>>>as ours.

>
>
> *If you think of it the other way round, since he was
> describing our universe why would he bother saying it.
> Remember he was writing in 1905 and ideas like "parallel
> universes" were far in the future.*
>
>
>> *I assumed it was another one since everyone already knew ours
>>is a 4d universe. What I read seemed to strongly infer a second
>>universe.*
>>
>>*More recently, Stephen Hawking wrote in his book, "A Brief History Of
>>Time", page 24, that "It is often helpful to think of the four
>>coordinates of an event as specifying its position in a
>>four-dimensional space called space-time. It is impossible to imagine
>>a four-dimensional space." Here, even Hawking refers to s-t as if it
>>were a parallel U.*
>
>
> *I can see how you might read it that way. It's always
> difficult to throw off a false impression like that
> when you have no doubt interpreted everything you
> read since in that way. Oh well, all I can say is
> rest assured he was talking of our universe, not a
> parallel one.*
>
>
>>>>*The idea of "moving through space" implies some sort of
>>>>static condition of space which is the Newtonian view
>>>>that relativity discarded.*
>>>
>>>
>>*I see no such implication because objects move through space all the
>>time in our everyday world, which seems will happen even though
>>everything in the universe is always moving through space.*
>
>
> *OK, we can agree to differ on that, I only see it as
> an implication. Language isn't always definitive.*
>
>
>>*However,*
>>*having said that, my model does claim that dark matter is essentially
>>static in space. Waves move through space, and so does visible matter,
>>but invisible matter stays in place in space.*
>
>
> *Relativity says the concept of "static in space" is
> meaningless. In SR any inertial frame can arbitrarily
> be called "static" and everything else is moving in*

> *that frame. GR extends that to accelerated frames.*
> *Hence the implication, if "moving through space" is*
> *to mean anything, there should exist some special*
> *condition which could be described as static against*
> *which the motion is to be measured.*
>
>
>>*And once again I note that you refer to classical physics as being*
>>*"discarded", as in rejected, by Relativity, although many here claim*
>>*they do not act as if they still believe that.*
>
>
> *In everyday life, speeds are so far below the speed*
> *of light that the two views are indistinguishable.*
> *The Newtonian world view is a perfectly adequate*
> *approximation.*
>
>
>>>>*He means that if you view the*
>>>>*world as four-dimensional, each particle or object can*
>>>>*be considered as moving through it at a fixed rate.*
>>>
>>>
>>*But Hawking said that is impossible.*
>
>
> *If you mean the quote above, he said it was impossible*
> *to _imagine_ or perhaps visualise would be a better word.*
>
>
>>*But, if it wasn't, I assume you*
>>*mean above "at a fixed rate" IN TIME but not necessarily at a fixed*
>>*rate of speed, no?*
>
>
> *It means at a fixed rate through spacetime. The rate*
> *through time and through space are then related in a*
> *manner similar to Pythagoras' Theorem. The combination*
> *of the two rates always produces the speed of light.*
>
>
>>>>*The*
>>>>*spatial axes are orthogonal to the time axis as well as*
>>>>*each other so if you are at rest in your chosen inertial*
>>>>*frame then all the motion is along the time axis.*
>>>>
>>>
>>>
>>*Yes, I know all that, but my contention is that it is only possible to*
>>*do all that with the math construct which is space-time, and not,*
>>*according to Hawking, in reality.*

>
>
> *See my next two paragraphs where I already addressed this:*
>
> <snip>
>
>>>*All of physics consists of mathematical models of the*
>>>*world around us. Ohm's Law says voltage equals current*
>>>*times resistance. Ohm's Law is a mathematical model of*
>>>*a resistor, it isn't actually a resistor. Relativity is*
>>>*no different in this respect.*
>>>
>>>
>>>>*So AE's 4d universe is imaginary?*
>>>
>>>>*No, like all others, his theories are descriptive and*
>>>>*to be quantitative (i.e. useful), they are mathematical.*
>>>>*What they attempt to describe is what is real.*
>>>
>>>
>>>>*Then*
>>>>>*why does almost everyone believe it is a real place, and that moving*
>>>>>*through time is the same as moving through space?*
>>>
>>>>*That is a philosophical point of view regarding our*
>>>>*universe which is fairly easy to conclude from the*
>>>>*mathematical model.*
>>>
>>>
>>
>>>>*Yes, quite so. Thank you.*
>>
>>>
>>>>*It is less easy but more accurate*
>>>>*to visualise the whole 4D manifold with everything in*
>>>>*it as a single structure. In this view I am a spiral*
>>>>*line (round the Sun once a year) with some thickness*
>>>>*hopefully about 70 years long and "now" is a point*
>>>>*along that line.*
>>>
>>>
>>
>>>>*Hmmm.... How is that more accurate than s-t?*
>
>
> *I think there is some confusion here, what I said*
> *isn't an alternative to spacetime, it is a way of*
> *thinking about spacetime as was the previous*
> *paragraph. We live in a 4D manifold which we is*
> *called spacetime. My life in that is a 4D shape,*
> *about 174cm by 35cm by 20cm by 70 years.*

>
> <aside>
> I'm mixing my units a bit, 70 years = 2.1Gm ; -)
> </aside>
>
> The concept of me moving through spacetime implies
> I am a 3D creature living in a 4D universe. Note
> that the idea of "now" is also somewhat misleading,
> it may not really exist. Every instant of my life
> was/is/will be "now" at that instant.
>
>
>>>>>To put it in lay terms, if you stand still you will
>>>>>still get older – you are moving forward in time. Look
>>>>>up "four-velocity" for better explanations than I can
>>>>>offer.
>>>>
>>>>George, we move forward in time whether we're still or moving,
>>>
>>>everyone
>>>
>>>>knows that.
>>>
>>>Exactly. It also follows that different paths from
>>>one event (point in spacetime) to another may have
>>>different lengths, hence it is easy to understand
>>>the Twins Paradox. Clocks flown around the world
>>>(and many other experiments) have demonstrated this
>>>effect is quite real.
>>>
>>>
>>
>>But here again you are mixing math with reality.
>
>
> Again, see above what I said about this. The math
> is a description of the reality.
>
>
>>We know that
>>different paths from an event may have different lengths, but that
>>knowledge is based on the Principle of Equivalence and not on $s-t$.
>
>
> <http://aether.lbl.gov/www/science/equiv.html>
>
> I don't see the relevance. Are you perhaps thinking
> of the invariant interval?
>
>
>>math. If it was based on math, we would have to believe that $s-t$ is a

>>real place.
>
>
> *It is. We live in it.*
>
>
>>>>*How does the rocketship on the surface of Earth move
>>>>through the curved space of Earth, as AE said?*
>>>
>>>*This is the way I think of it though it's a personal
>>>view. If, like me, you have trouble thinking in 4D,
>>>you'll need to use a little imagination ; -)*
>>>
>>>*First think of a slice through the Earth at the equator.
>>>The Earth is a 2D circle which is red in the centre
>>>and has a thin blue and brown edge. Now think of that
>>>extended in time as a cylinder which is red in the
>>>centre and blue/brown on the surface. An object free-
>>>falling from space would form a curved line approaching
>>>the cylinder until it hits the surface, say on a brown
>>>bit (land, not sea).*
>>>
>>>*At that point the surface forces
>>>it off the path it would have taken had it been able to
>>>continue falling to the centre. Thereafter the path of
>>>the object is continually being pushed off these curved
>>>lines*
>>>
>>>
>>
>>*Which curved lines, George?*
>
>
> *The lines described by a family of free-falling
> objects, geodesics I believe, as I said later.*
>
>
>>>*and it is forced to lie along the surface of the
>>>cylinder.*
>>>
>>>
>>
>>*As the cylinder moves through time,*
>
>
> *The axis of cylinder _is_ time.*
>
>
>>*yes, but the cylinder is imaginary,*
>
>

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- > *It is in our imagination but it is a visualisation*
- > *of reality. As you said, most people know we live*
- > *in a 4D universe. All I have done is ignore the*
- > *north-south direction so that you can more easily*
- > *visualise the remaining three. As Hawking said in*
- > *your quote above, "It is impossible to imagine a*
- > *four-dimensional space." I have seen a few people*
- > *say they can do it but it's certainly very hard.*
- >
- >
- >>*George, and so the rocketship is not really moving through the curved*
- >>*space of the earth, is it? Everyone knows that while it sits on Earth,*
- >>*it then is also moving through time, as is the planet and all of us on*
- >>*it, but that does not mean it is moving through the curved space of*
- >>*Earth.*
- >
- >
- > *It is moving through spacetime which is curved by*
- > *the gravity of the Earth (and Sun etc.).*
- >
- >
- >>*Was not this then another one of the Great Scientist's Great Jokes on us?*
- >>*Or was it just another one of those theories that don't work but are so*
- >>*complicated few if any can understand it much less explain it (like his*
- >>*complex math of his static universe theory)?*
- >
- >
- > *With the possible exception of a few post-Newtonian*
- > *variants that are observationally indistinguishable,*
- > *it is the only model of the universe we live in that*
- > *accurately describes gravity. It is a model that*
- > *reflects the currently accepted view of reality.*
- >
- >
- >>>*These curved lines are a family of geodesics*
- >>>*if I understand the term correctly (which is in doubt!).*
- >>>
- >>>
- >>
- >>*And geodesics is a math construct relating to the geometry of curved*
- >>*surfaces.*
- >
- >
- > *See my comments on Ohm's Law again. Geodesics are*
- > *like the gently curving Cartesian grid lines you*
- > *see faintly on maps of space when a TV program*
- > *wants to illustrate a black hole. There are no*
- > *glowing lines in space, but it really bends and*
- > *if the TV could represent a 4D grid, that would*
- > *be more accurate.*
- >

> *George*

>

>

I think the idea of Absolute Space with an Absolute origin of coordinates does not exist. The reason that relative motion is not unique. We may choose our axes to be convenient, but they are always arbitrary in that way. We can only talk of relative motion in the arbitrary frame we have defined. That frame is moving in Time but is locally stationary. So an object can move in 4 dimensions but we can only see and map the 3 space. In the 3 space for our local origin, the motion is defined. It is not Absolute Motion, it is relative motion.

Hawking would have understood this exactly. when George says

>>>>*He means that if you view the*

>>>>>*world as four-dimensional, each particle or object can*

>>>>>>*be considered as moving through it at a fixed rate.*

>>>>

>>>>

>>>*But Hawking said that is impossible.*

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> *If you mean the quote above, he said it was impossible*

> *to _imagine_ or perhaps visualize would be a better word.*

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>

>>*But, if it wasn't, I assume you*

>>*mean above "at a fixed rate" IN TIME but not necessarily at a fixed*

>>*rate of speed, no?*

He is having trouble with the implications that Hawking used. Hawking knows of the problem of origins and was not discussing that. He was discussing something that occurs in space on a relative coordinate system. Hawking would have been talking indirectly about translating axes. If we change to an accelerating frame, Hawking would have noted that the reality would be different from what we could see. I am pretty sure he would have said something like "orthogonal dimensions" because we can never really measure the coordinate time, only relatively know what is happening. What Hawking would have said was that it was impossible to measure (absolutely). And Hawking would also know that translation of axes would mean that motion implies a change in the rate of time He would have know it was impossible to tell if we are moving.

I think that is what he meant when Hawking used the word impossible.

I hope this explanation helps a little and it is not too confused.

josephus