Re: Analyse This!

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2006−08/msg01750.html

- *From*: "Igor" <thoovler@xxxxxxxxxx>
- *Date*: 18 Aug 2006 10:06:41 −0700

me wrote:

> Igor wrote:
>
> > me wrote:
> >
> > > Igor wrote:
> > >
> > > > me wrote:
> > > >
> > > > > Tom Roberts wrote:
> > > > >
> > > > > > Ahmed
> > > > > > Ouahi,
> > > > > > Architect
> > > > > > wrote:
> > > > > >
> > > > > > > More
> > > > > > > or
> > > > > > > less
> > > > > > > reflexively,
> > > > > > > he
> > > > > > > dropped
> > > > > > > into
> > > > > > > his
> > > > > > > equations
> > > > > > > something
> > > > > > > called
> > > > > > > the
> > > > > > > cosmological
> > > > > > > constant,
> > > > > > > which
> > > > > > > arbitrarily
> > > > > > > counterbalanced
> > > > > > > the
> > > > > > > effects
> > > > > > > of
> > > > > > > gravity,

serving
as
a
kind
of
mathematical
pause
button.

Books
on
the
history
of
science
always
forgive
Einstein
this
lapse,
but
it
was
actually
a
fairly
appalling
piece
of
science
and
he
knew
it.
He
called
it
'
the
biggest
blunder
of
my
life
'.
"

From
today's
perspective

this was not a blunder at all. Thinking abstractly, one cannot eliminate from the Lagrangian any terms that satisfy the symmetries required of the theory (chiefly general covariance). If one restricts the terms to those with no derivatives higher than the second, and requires linearity in those second derivatives, one obtains the Lagrangian that yields the Einstein field equation, with cosmological constant. It is the simplest non−trivial Lagrangian that obeys the necessary symmetries.

It is, of

course, up
to
experiments
to
determine
the value of
the
cosmological
constant.
Until rather
recently, the
value was
"quite
small,
consistent
with zero";
with
improved
techniques
we now
measure it
to be
nonzero.
Einstein
originally
favored
zero,
because
then the
Newtonian
limit comes
out correct;
with a very
small value,
however,
deviations
from
Newtonian
mechanics
would not
be
detectable.

Tom
Roberts

if it is consistent with zero,
who is expanding the
universe

thank you for this email

> You don't need a cosmological constant to
> provide expansion. In fact,
> Einstein originally used it to pull the
> universe back together, but

whay, was the gravity not strong enuff?

Not strong enough to maintain a static universe that wasn't expanding.

> when the universe was found to actually be
> expanding,.he discarded it.
> Or haven't you been paying attention?

> is it pushed from inside or is
> it pulled from outside?

It's the result of the big bang.

from inside or from outside?

No inside or outside on a manifold. There's just spacetime. The
actual "shape" of that manifold is what has always been debated.

> this because there should be
> more vacum and empty
> space
> outside than it is here inside

> Where's this outside that you're talking
> about? GR models the universe
> as an open or closed spacetime manifold.
> There is no outside.

> > i tell you what, is somthing bigbang is exploding then
> > expanding, it does it against the outside
> >
> > an imploding and contraction does it against inside
> >
> > dont you know it? where have you been?
>
> You don't know what you're talking about. Tell me where the inside and
> outside are on the surface of a sphere. They don't exist. All you
> have is the surface. Think of it in those terms. A spacetime manifold
> is somewhat analagous to this, except in 4 dimensions instead of the 2
> dimensions on the sphere.

thank you for this new e−mail

It's not an email. It's a usenet message.

> apparently you make things clear for me,
> but still,
>
> this surface to universe analogy went too
> far, everybody use it, even reporters and
> moviemakers, and obviously thay dont
> know what they are talkin aboit

Any analogy can be taken too far. Which is why it's usually better to stick with the actual equations instead of the analogy. But the analogy can be very helpful so long as you don't confuse it with the actual model you're working with.

> whay using a 2d surface analoguous to
> a 4d manifold
>
> whay not using 3d analogous to 4d

This can be done. It's just that many people have trouble thinking in 3d and find it easier in 2d.

> another question I have is
> about the big bang
>
> if by using powerful
> telescopes
> 1. we can detect the
> primitive bigbang light and
> radiation
> 2. we can detect that
> everywhere in 3D
> 3. the distance to the
> bigbang light is increasing
> because expansion
>
> are we inside the bigbang
> now?

> In a sense. We see the effects of the big bang
> all around us, but the
> temperature of the universe has cooled to
> just under 3 K.

> thanks, now that you agree with inside, then an outside must
> exists

> Depends on whether you are talking about 3 dimensions of 4. In 3
> dimensions, we appear to be inside something, but that space is not the
> total picture and is emnbedded in 4 dimensional spacetime, where the

> is it a rank 3 tensor with 4 elements?

I don't understand what you're even asking about. The main object in
GR is a rank 4 tensor in 4 dimensional spacetime called the Riemann
Curvature. For more information:

http://en.wikipedia.org/wiki/Riemann_curvature_tensor

> universe is a self−contained manifold. No inside or outside. Now, you
> might be able to come up with a theory where spacetime were embedded in
> higher dimensions, but it would not be GR.

> only a holywood filmmaker would do that

No, a physicist or mathematician might do it also. There have been attempts in that direction, with mixed results.

> because if we reverese the expantion, then we have no choice, but being inside the bigbang

> That's called the big crunch, essentially running the big bang in reverse. It was once thought that it might be the ultimate fate of the universe if there was sufficient total mass for gravity to overcome the outward expansion and pull everything back together again. But it doesn't look like it will happen due to the accelerated expansion that we now see.

> what is better, to expand or to impand?

> Impand is not even a word. Why am I wasting my time?

> no, you dont, you make things more clear to me, thanks

Well, glad to be able to help. By the way, I think maybe the words you were looking for were explode and implode.

.