

To: Jeffrey Epstein[jeevacation@gmail.com]
From: Lisa Randall
Sent: Fri 10/2/2009 10:12:19 PM
Subject: Re: metric

You can calculate the value of time and make a new metric.

Jeffrey Epstein wrote:

> joking, for me , space and time are disconnected as my fingers hunt for
> keys

>

> On Fri, Oct 2, 2009 at 6:00 PM, Lisa Randall

> [REDACTED] wrote:

>

> Oops. Problem of email. No offense intended. I was really a little
> confused. Or were you joking?

>

> Jeffrey Epstein wrote:

>

> sorry,

> On Fri, Oct 2, 2009 at 5:41 PM, Lisa Randall

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[REDACTED] wrote:

I think I'm reaching the limits of my ability to disentangle
grammar
and spelling but here goes:

Jeffrey Epstein wrote:

thanks , question , what does it look like if time is
running
backward , wouldn't it be decelerating,, into flat space
from
the singularity outward,, therefore explosion than

[then]
expansion.

It looks like big bang, not inflation before horizon. So not
explosive expansion.

but always slowing after

crossing the horizon .

after crossing horizon there isn't really a cosmological
interpretation anymore. Time and space have switched back.

looking in reverse it appears things accelerate

as they approach,, charged would be as a result of the
deceleration.

don't understand this last comment.

On Fri, Oct 2, 2009 at 5:27 PM, Lisa Randall

>>> wrote:

Hi Jeffrey. It was interesting-as always.
For your question, let's first straighten out that
there are
3 types
of bhs we might be discussing: Schwarzschild, charged,
and Kerr. I
didn't say much about Kerr--I mostly discussed charged--
since they
are changing with time and a bit more complicated but
indeed they
have 2 horizons (just like charged black holes).

Two horizon scenario means time and space switch twice
so at
singularity you are back to ordinary time space
identification. So
let's first just consider Schwarzschild (uncharged, not
rotating). In
that case you are on the right track. Reversing time and
coming from
the singularity, it pretty much looks like a 2d big
bang scenario
(with the other 2d in a compact sphere). Space expands out
until you
reach the horizon and eventually goes over into flat
space.
It's not
really accelerated expansion but still somewhat along
lines you
suggested.

If there are two horizons (charged black hole case)
and you
are in
between them (we called this Whoville because it looks
like space
has shrunk to zero but actually spacetime has not and
there is a
finite time between them so there's a whole world
invisible
to the
outside) what happens is you alternate between big
bang and big
crunch in the full extended spacetime.

Jeffrey Epstein wrote:

Lisa . thanks,, for your time,and patience if i

> understand the
> Kerr equations , and your explanation correctly , time
> and space
> appear to exchange coordinates , inside a black
> hole. ,
> that
> assumes that time is unidirectional. doesn't it appear
> that if
> you ran negative time , it would look like any other
> explosive
> transaction. great acceleration. emanating from
> the second
> horizon outward slowing to a mere expansion . It
> would
> appear
> that " time" got shot out of the black hole.
> created by a
> space
> collapse at the singularity.
>
> --
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