

Re: Inside a black hole

Source: <http://sci.tech-archive.net/Archive/sci.physics.relativity/2005-07/msg01113.html>

- *From:* "N:dlzc D:aol T:com \(\dlzc\)" <N: dlzc1 D:cox T:net@xxxxxxxxxx>
 - *Date:* Sat, 16 Jul 2005 21:34:43 -0700
-

Dear RichD:

"RichD" <r_delaney2001@xxxxxxxxxx> wrote in message
news:1121560295.804470.58850@xx

- > Dear David A. Smith,
- >
- > N:dlzc D:aol T:com (dlzc) wrote:
- >> Dear RichD:
- >>> It is possible to change your position in angle
- >>> (θ , ϕ) but a stable orbit is not possible.
- >>> You will continue to approach the
- >>> singularity no matter what you do.
- >>>
- >>> So you can't orbit like a planet around the sun?
- >>
- >> Far enough away, yes. But keep in mind that a
- >> BH tends to consume additional matter, so
- >> you'll need to keep boosting out a bit.
- >
- > No, I meant after entering the hole, you can't
- > orbit the singularity?

No. Consider that the fastest thing in the Universe is light, it
it can only "orbit" in the photon sphere, which is **outside** the
event horizon. Inside this photon sphere, all vectors point at
the singularity (more correctly, the event horizon).

- >> But Mr. Dumse was talking about inside the
- >> horizon, where r is believed to become an
- >> internal t . Can you stop the passage of time,
- >> and see the Universe as unchanging? This is
- >> what such an "orbit" would entail.
- >
- > "r becomes t"?
- > What does this mean?

Outside the black hole, one could describe our entire Universe
spatially, from coordinates located at the geometrical center of
this black hole. Were you to use spherical coordinates, r

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provides the "radius" from this "center" to any point "out here".

At the event horizon, in one solution—set to GR, "outer r" becomes timelike at the event horizon. This means that inside the black hole, time starts at the "inside" of the event horizon (aka. Big Bang), and proceeds towards the "singularity".

Can you orbit at constant time t in this Universe? Note that could you travel at c , you might stop aging, but you are still heading for the future.

>>> Let's say I fire my thrusters so as to move away from
>>> the singularity. Space is curved, so I don't travel
>>> straight away from it. But I watch my rear view mirror,
>>> and continually make corrections to keep moving further
>>> out (toward the horizon).
>>>
>>> Why can't I do that?
>>
>> Because once inside the event horizon, everything
>> moves away from "The Big Bang".
>
> ?

Can you stop time for the entire Universe, from your frame of reference, and you still be "aware of it"?

>>>> Will you 'bump your head' on the event horizon?
>>>>
>>>> No, the horizon is (after all) moving away from
>>>> you at the speed of light. You can never regain it.
>>>>
>>> hmmm, you mean, for an observer inside, the
>>> hole's outer surface appears to grow at the speed
>>> of light? Very strange.
>>>
>> Look at the CMBR. It is pretty close to the edge of
>> observability now.
>
> ?

The CMBR is just inside the event horizon of the black hole that contains our Universe. (From the POV on one set of solutions to GR.)

>> Consider that *this* Universe could very well
>> be the inside of a BH. The mathematics
>> describes the inside of a BH very much like
>> it describes the Universe around us.
>
> So if we're insude a black hole, that means

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> there's a singularity at the 'center' of the
> universe?

Actually, no. The container Universe will insist that we are moving towards a singularity, yet internal space in our Universe is *unconstrained* by the container Universe. It is free to expand, in agreement with the second law of thermodynamics, and our "singularity" is (apparently) a cold, dark, infinitely diffuse future.

> Wouldn't
> that violate the anisotropy of space?

Such "violation" is perhaps in the *other* direction (towards the past). But we won't be able to see on the other side of that which produced the CMBR, so we won't be able to tell.

>> >> > And how does angular momentum affect any of this?

>> >>

>> >> A rotating black hole drags space with it.

>> >>

>> > I had in mind an object not falling straight through,

>> > but obliquely, like the space shuttle re-entering

>> > the atmosphere.

>>

>> When all vectors point into the hole, what are niceities like

>> "oblique"?

>

> I can fire a bullet straight up, or at a 45* angle. The

> vectors at which they strike the earth will have different

> directions.

In this case, there is no "up". All vectors are down. Some are "downer" than others. Light sent directly up from just outside the event horizon might eventually make it out. But once inside the event horizon, all light is heading for the center (aka. the future).

David A. Smith

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• *Follow-Ups:*

◆ *Re: Inside a black hole*

◇ *From: vic*

• *References:*

◆ *Inside a black hole*

Re: Inside a black hole

◇ *From:* RichD

◆ ***Re: Inside a black hole***

◇ *From:* Randy M. Dumse

◆ ***Re: Inside a black hole***

◇ *From:* RichD

◆ ***Re: Inside a black hole***

◇ *From:* N:dlzc D:aol T:com \((dlzc\)

◆ ***Re: Inside a black hole***

◇ *From:* RichD

- Prev by Date: ***Re: hawking radiation***
- Next by Date: ***Re: What, precisely, is an Aether Theory?***
- Previous by thread: ***Re: Inside a black hole***
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