Inside and Outside a Black Hole
using
True Relativity

Abstract

This paper is based on the theory of True Relativity[1] to view Space-Time using simple Newtonian mathematics and geometry. The paper shows the extremes of gravity and acceleration inside and outside a black hole from the point of view of True Relativity[1] and gives a distinct description of the forces involved and what happens to Time and Space when an object enters a black hole past the event horizon until just after the singularity.

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1 Introduction

In this paper all measurements of Space and Time are measured in Universal Time© using the Universal clock© in accordance with the principles of True Relativity[1].
Because True Relativity[1] reveals a great deal of information on black holes that as yet is little understood, in this paper I will try to give a graphical representation of the kind of detail True Relativity can uncover. A more detailed research of black holes will need to be undertaken at a later date.
All the claims in this paper can be reproduced by anyone with a personal computer and a math programme.
I will use graphs to give a visual representation of Space-Time fields and the forces involved when modelling the black hole. As usual in True Relativity[1], both Space and Time will be measured separately.

In General Relativity a black hole is so dense that nothing can escape from it, not even light. General Relativity breaks down under such extremes so it cannot describe what goes on inside a black hole. It is believed that a singularity exists inside and True Relativity[1] also shows a singularity where the gravitational force becomes infinitely strong, but the physics of True Relativity[1] does not end at the Schwarzschild radius or at the singularity.

According to True Relativity[1] the black hole becomes an extreme sink for matter/mass and Space-Time fields, swallowing everything caught up in its gravitational field. It is an extreme low Space-Time pressure point in our Universe.

In True Relativity[1] there is only one true constant in our Universe and that is 'c', all other parameters including time and length are dependant on which inertial frame of reference they are viewed from.

To recap from True Relativity[1], every object or particle generates its own Space-Time field and a mass-less particle considered at rest generates the largest radius for a Space-Time field r = c for the first second of any particle in this Universe.

The equation used for Figure 1 is $r = (3t\Phi/4\pi)^{1/3}$
where t = Universal seconds© and $\Phi = 4/3\pi c^3$

First let's see the radius of a Space-Time field in the first 100 Us (Universal seconds©) emanating from a mass-less particle considered at rest.

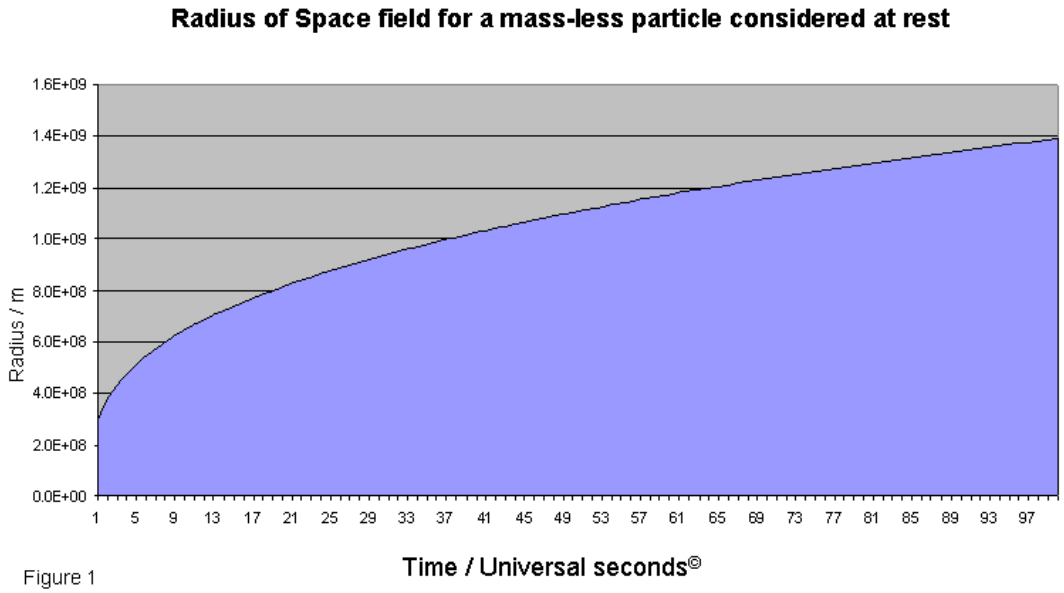

Figure 1

As can be seen from Figure 1, the rate of increase in the radius of the Space field begins to slow over a span of 100 Us. I shall use Figure 1 as a comparison to the generation of a Space field by a black hole.

It is believed that a black hole lurks at the centre of our galaxy in Sagittarius A* so I shall use it's mass and radius for a mathematical model using True Relativity[1].

2 Inside a black hole

I will look inside a black hole and see what the math of True Relativity[1] tells me. The equation used for this paper from True Relativity[1] is

$$STfield_{BH} = (3t\Phi/4\pi)^{1/3} - (2GM/R)^{1/2} \quad (1)$$

where t = time in Universal seconds© , $\Phi = 4/3\pi c^3$, M = mass of the black hole, $R = 2GM/c^2$ = Schwarzschild radius and G = Newton's gravitational constant's true value from [1].

The same parameters from [1], [2] and [3] are used.

$c = 2.99792458 \times 10^8$ m s^{-1}
$\Phi = 4/3\pi c^3$
$G = 6.672\ 283\ 455\ 452\ 991 \times 10^{-11}$ N m^2 kg^{-2}

In Figure 2 below, the same count in Universal seconds© is used to show a graphical representation for the radius of the Space field emanating from the black hole.

The black hole in Sagittarius A* at the centre of the Milky Way is believed to have a mass of about 2.6 x 10^6 solar masses and the inertial frame of reference from where it is viewed from, is in free Space.

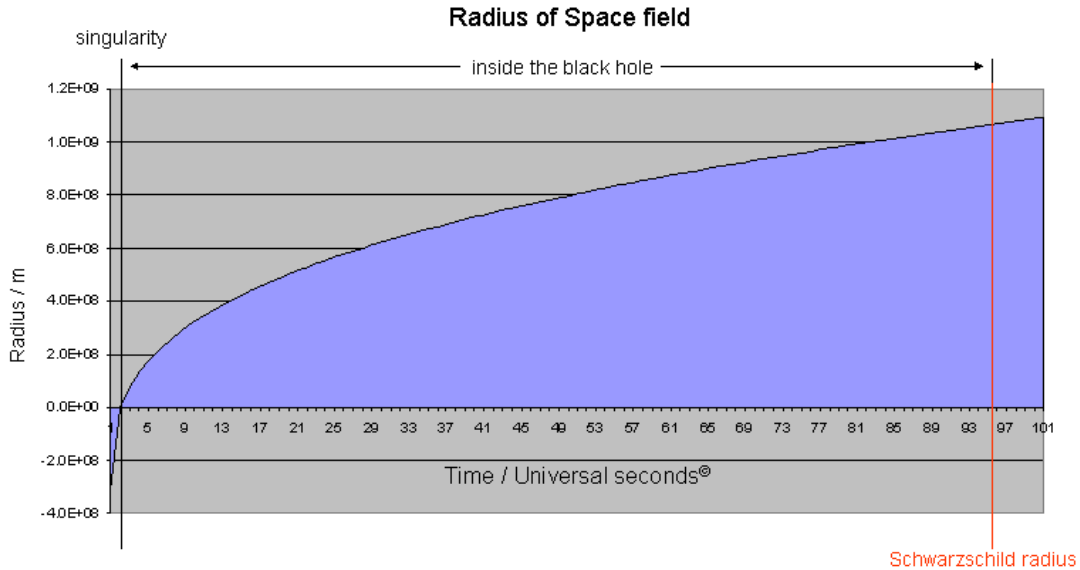

Figure 2

I have marked the Schwarzschild radius on the right of the graph in Figure 2 to show where the radius of the Space field allows light to escape the black holes gravitational field. On the left of the graph is where the singularity exists but to the left of the singularity the black hole appears to be generating negative Space-Time but not at the same rate as positive Space-Time.

The singularity on the left of the graph will need a closer look later on in the paper. As you can see, the black hole's Universal Time© has to beat for nearly 96 Universal seconds© before the force drops enough to allow for light to escape. The generation of Space by the black hole appears to be asymmetric so a closer look at the singularity is required. The forces involved are immense and these are shown in Figure 3 below. The Newtonian equation used is

$$F = GM/r^2 \quad (2)$$

where r = radius of the Space field at each Universal second©.

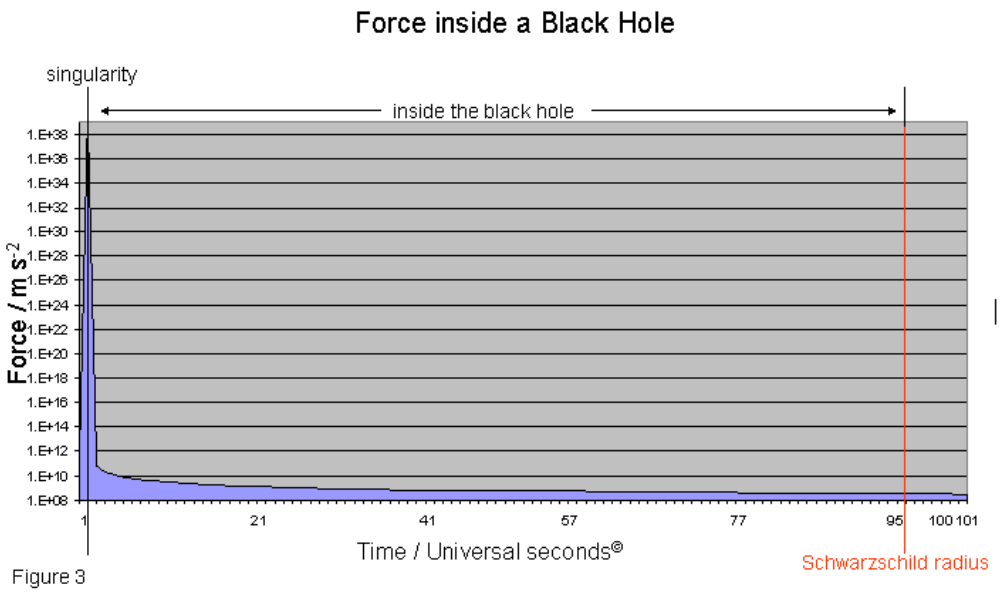

Figure 3

In Figure 3 the singularity to the left appears to be the barrier between our Universe and the negative universe on the other side. If we look at the volume of the Time field generated by the black hole it also shows a negative volume of Time on the other side of the singularity.

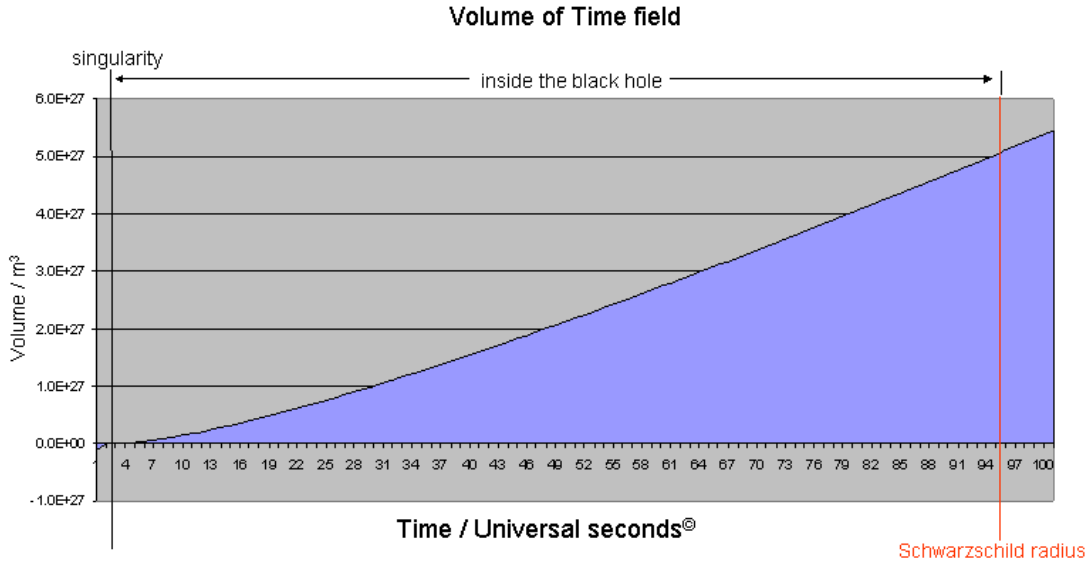

Figure 4

As can be seen in Figure 4 the volume of the positive Time field increases slowly.

3 Around the singularity

A closer look at what True Relativity is trying to tell us about the black hole and negative Space-Time will need to be looked at by professional mathematician's and physicist's. I am neither and as usual True Relativity gives results that need detailed explanations beyond my understanding at the moment. Sometimes when researching True Relativity I feel like a fifteenth century monk, trying to fly a modern day fighter jet whose controls are a little baffling, but the data must speak for itself.

Below in graphical form are the volume and radius of the Time and Space fields surrounding the singularity from 0.1 Us to 2.0 Us (Universal seconds©).

These graphs are produced from data derived from equations (1) and (2)

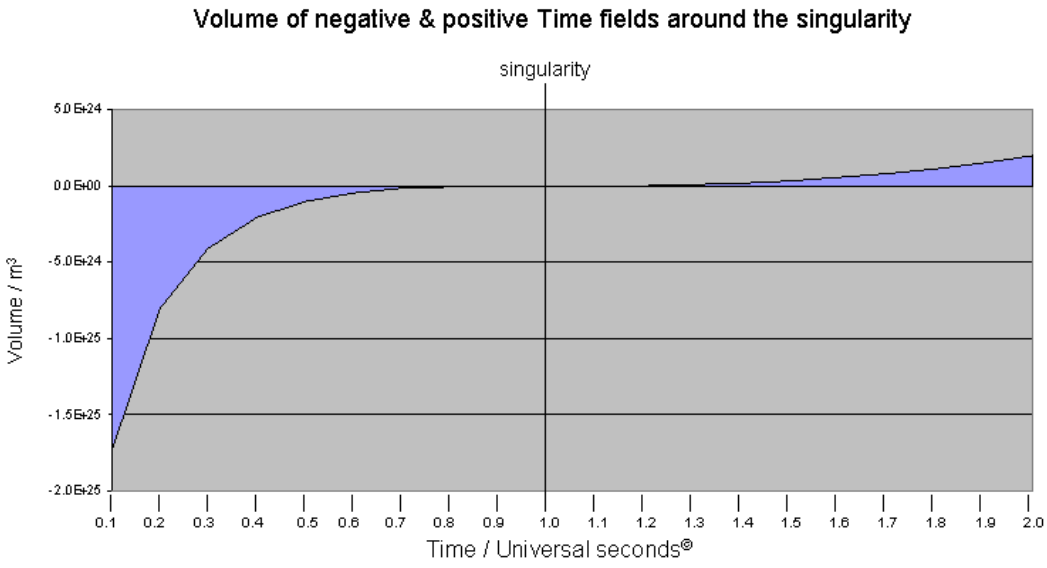

Figure 5

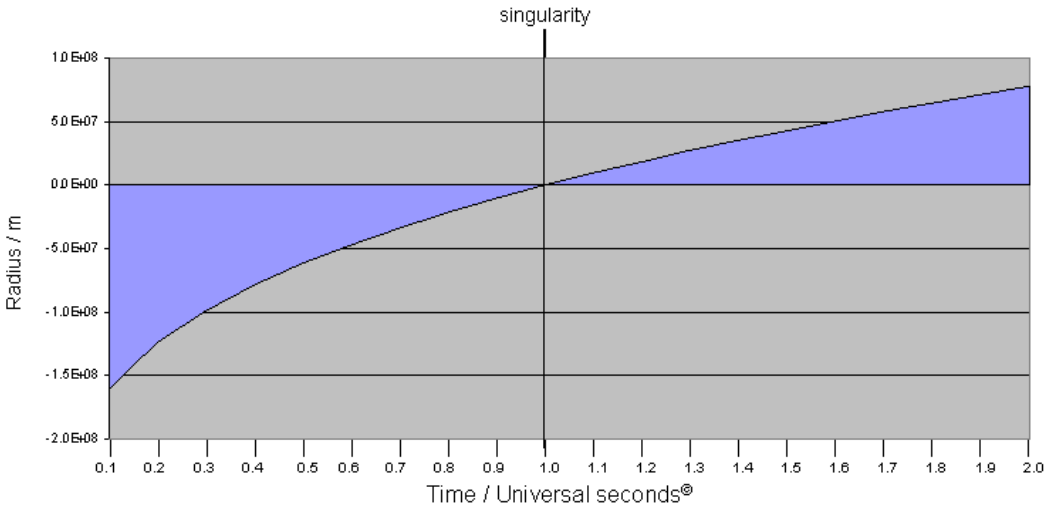

Figure 6

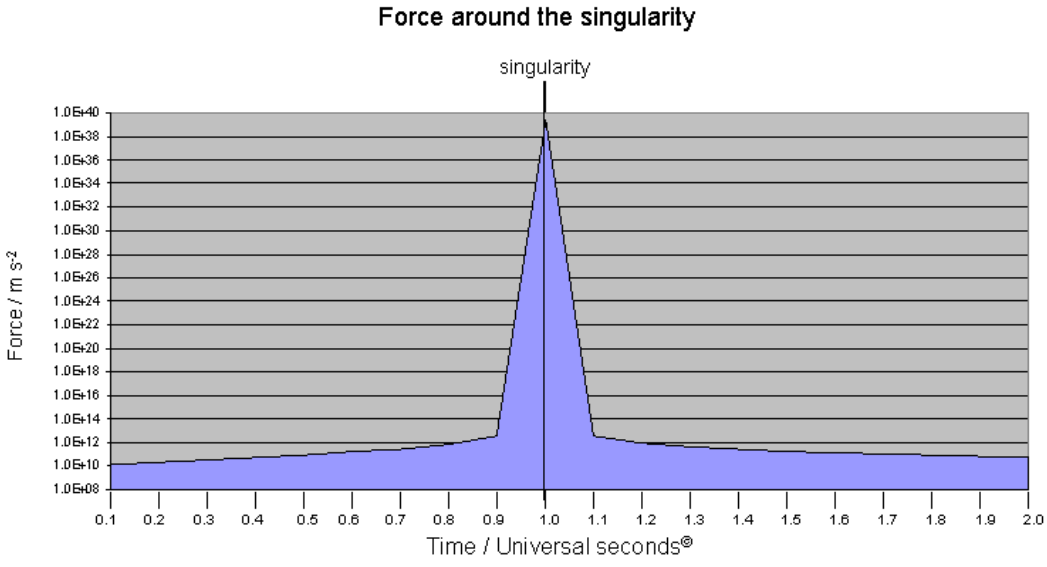

Figure 7

Note the asymmetry between the positive and negative Time and Space fields and the force.

The data also shows the asymmetric nature of the forces surrounding the singularity and this must have implications for our understanding of this Universe. The asymmetric nature of Space-Time generation by a black hole is totally unexpected and must warrant further investigation. There may be three possibilities for this asymmetry.

1. A mistake in the data,
2. The limitation of the computer to calculate π.
3. A real phenomenon.

I have checked the first one and cannot find any mistakes. Number 2 may be the cause because I'm using a personal computer which can only calculate π to 15dp, or lastly 3, it is a real phenomenon.

I have drawn a visual representation in Figure 8 to help me visualise what the math is telling me.

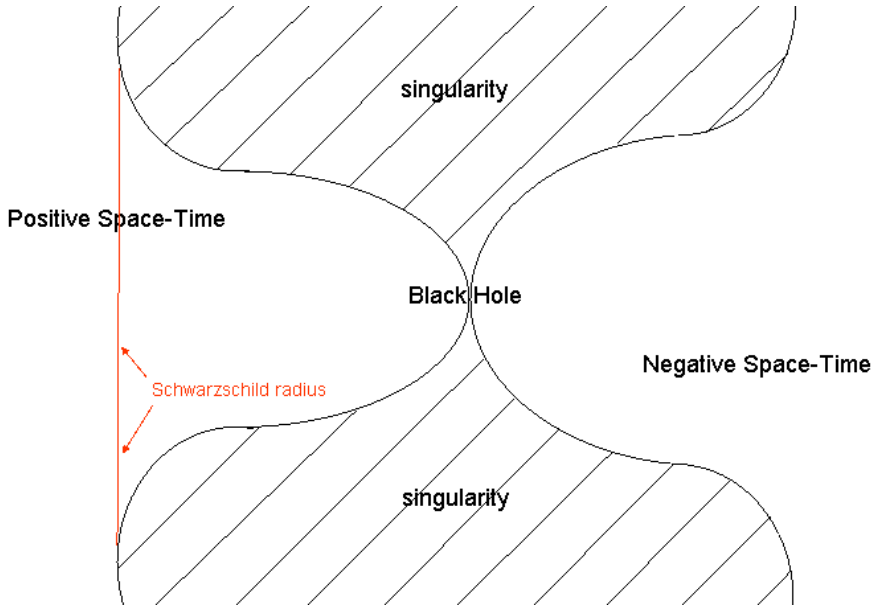

Figure 8

In Figure 8 I have tried to show the uneven nature of Space-Time generation by a black hole. On the right is negative Space-Time with the singularity barrier, between the two universes, in the middle. On the left is our Universe and in red is marked the event horizon.

What would happen to George, our astronaut from [1] if he was able to build a spacecraft that could withstand the immense forces inside the black hole?

Nothing would happen to George because in True Relativity[1] every body or object generates its own Space-Time field, so George, inside the spacecraft, would be totally shielded from all the forces outside, providing the spacecraft could withstand the forces involved. The matter that the spacecraft is made of however will experience major extremes of Time and Space dilation.

Let's send George inside the black hole in a special space suit built to withstand the extreme forces.

What would he see happening to the Universal clock© in free Space?

We start his epic 100 Us journey just outside the event horizon and continue on until just past the singularity.

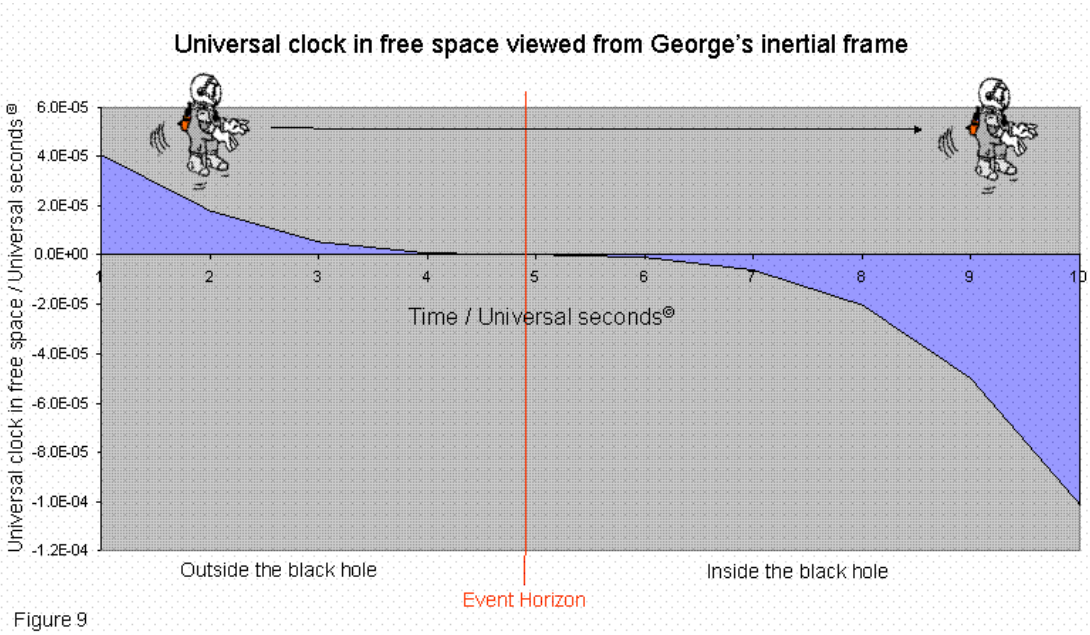

Figure 9

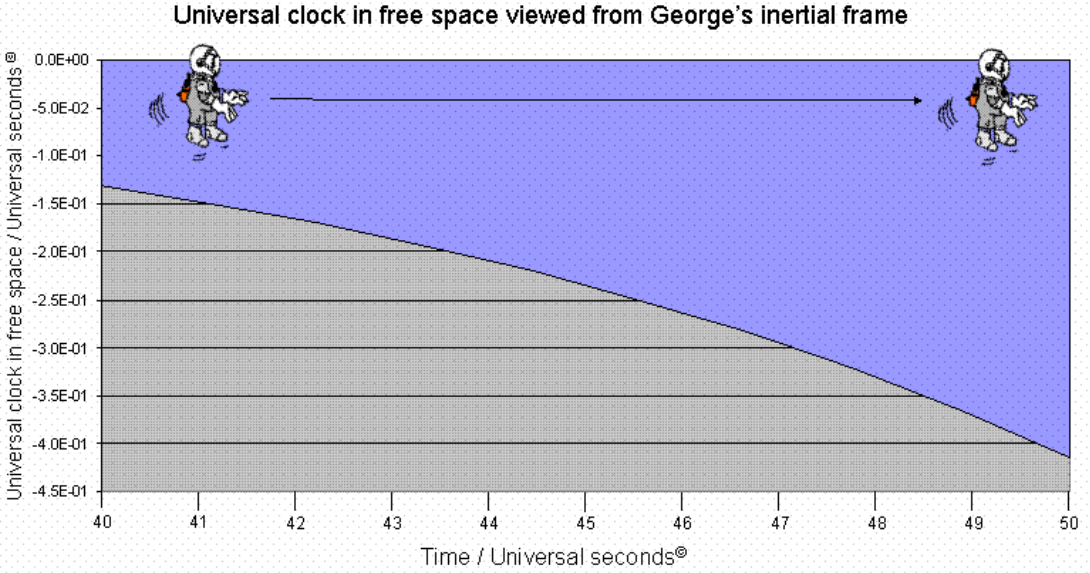

Figure 10

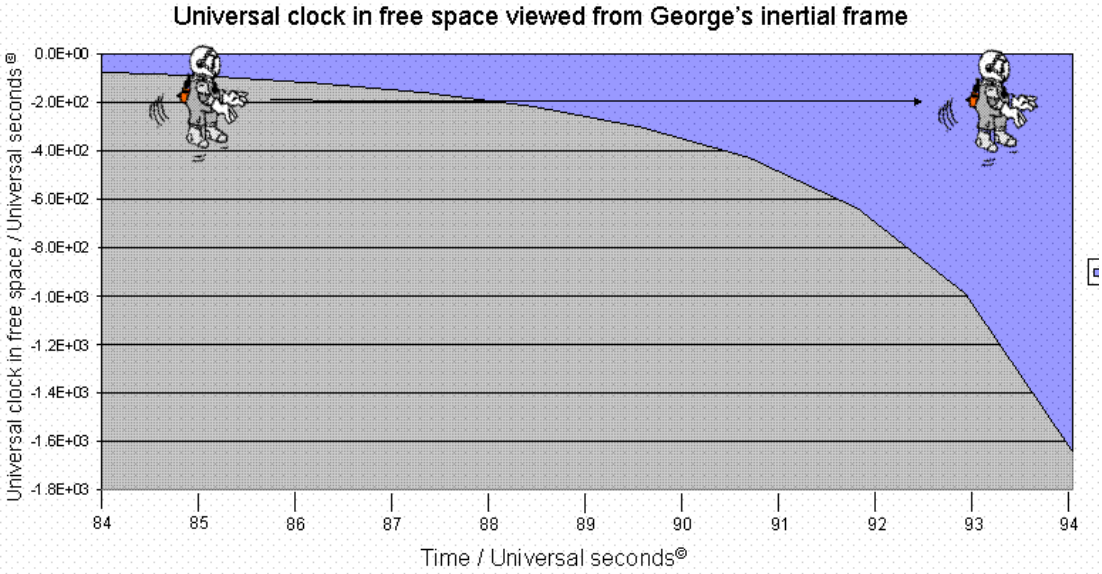

Figure 11

As George approaches the event horizon in Figure 9, from his inertial frame of reference, Time beats at an ever increasing rate for clocks located in free space. As he passes the event horizon, clocks in free space will appear to stop then go backwards, as shown in Figure 9

The reversal of clocks in free space carries on as he gets further and further inside the black hole.
Forty seconds after entering the black hole George would see clocks in free Space beating at the rate shown in Figure 10

As George begins to near the singularity the rate at which clocks in free space beat backwards would greatly increase. The outside Universe would appear to George to be going in reverse at an ever increasing rate, and as he passes over the singularity Universal Time© becomes infinitely negative.

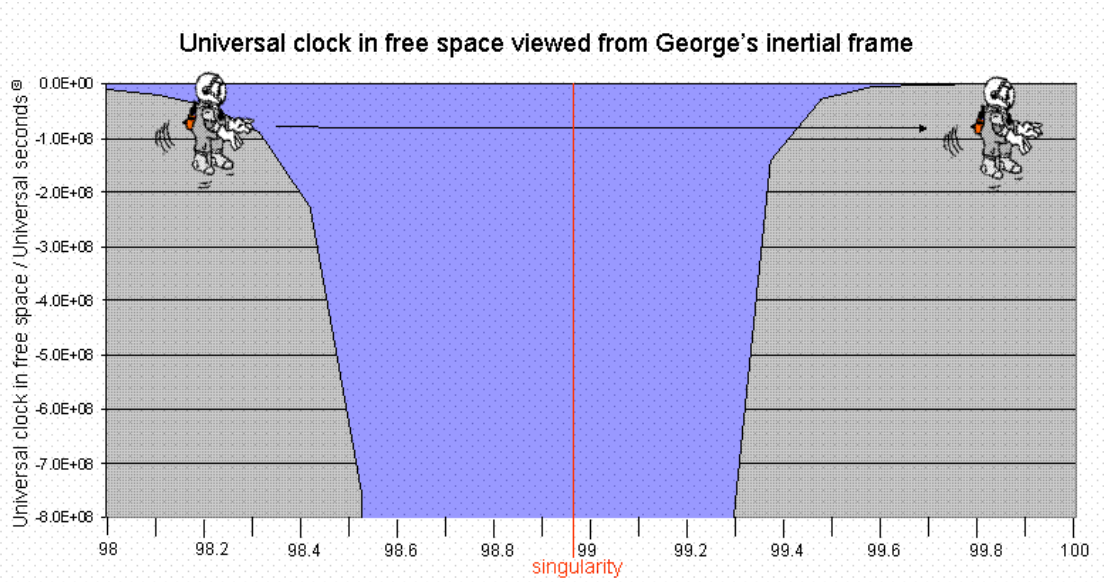

Figure 12

Once across the singularity the rate at which the Universal clock beats backwards, begins to slow. At this point the mathematics uses imaginary numbers of which I have real knowledge but I assume he would eventually emerge from the negative black hole where clocks in negative free space beat at a similar rate to clocks in positive free space.

4 Conclusion

The asymmetry between positive and negative Space-Time is the most striking point about black holes and must arouse curiosity, even in the most sceptic physicist.

This paper sets out to show that the math of True Relativity[1] does not break down, even inside a black hole but this scenario should be modelled on a super computer to truly find out what happens to Time and Space when an object passes completely through a black hole and into negative Space-Time on the other side.

The fact that Space and Time can be modelled inside a black hole gives a very strong indication that True Relativity[1] has merit and must eventually be taken seriously by the physics community.

5 References

[1] T. Stanton *Theory of True Relativity and the Universal clock.*. (available at http://www.wbabin.net)

[2] T. Stanton *Removing the accuracy drift and synchronising the GPS clocks using True Relativity and the Universal clock.*. (available at http://www.wbabin.net)

[3] T. Stanton *Gravity, Acceleration and inertia.* (available at http://www.wbabin.net)