XXX
Sum General Theory

Version 3 - Jonathan Ainsley Bain - 13 March 2018 (edit May 17) - www.flight-light-and-spin.com

Sum Theory demonstrates gravity in computational paradigms of two or more bodies. Applying the various theories of gravity to the solar system and beyond, every attempt is made to preserve each detail of the Relativities: whether from Einstein (Special and General Relativity), Feynman, Lorentz, Numerical Relativity, or the wider scope of other Post-Newtonian theories.

The key criterion being that theories on gravity must be in agreement with commonly observed astronomical data – and – they must be logically consistent within themselves. Thus the laws of physics cannot contradict themselves as a minimum standard of validity. The simulators used here differ from other online simulators, in that they are not driven by historical records of celestial data. Instead, starting parameters are used in conjunction with the various theories on the laws of gravitational physics to evolve purely according to those theories with two or more bodies.

Many other algorithms* were used to devise *Sum Theory*, but the primary program for this chapter is called ***orbit-gravity-sim-12.exe*** (OGS12). It is available for free download on the website www.flight-light-and-spin.com at the addresses:
www.flight-light-and-spin.com/simulator/relativity.htm or directly at
www.flight-light-and-spin.com/simulator/orbit-gravity-sim-12.exe
Help files are here: www.flight-light-and-spin.com/simulator/ogs12.htm

A summary of the contents of this chapter by section:

* For free access to the other OG algorithms, see links on the homepage: www.flight-light-and-spin.com

1

RELATIVITY AND THE ORBITS OF THE SOLAR SYSTEM:

Algorithm: orbit-gravity-sim-12.exe (OGS12)

Most other online '*solar system simulators*' simply describe planetary orbits according to recorded historical data. Where ***orbit-gravity-sim-12.exe*** (OGS12) differs, is that the user can select either the purely Newtonian laws, or individually turn on-and-off, both Special and/or General Relativity; then observe how the results differ. Different scenarios depict the geometry of various commonly observed celestial bodies. In the middle of a scenario, the user can also press the pause button, and then alter the planets' position, change their velocity, and observe how the various laws of gravity generate orbits thereafter. ***OGS12*** is thus driven not only by data, but by the most widely variable interactive evolutionary physics algorithm possible.

OGS12 also has changeable scales for distance and time. It is vital to comprehend the error-margins in processing the information. The user has been given complete freedom to fiddle as much as wanted with the various Solar-system scenarios. The result is that in doing so, the user may generate large margins of error. The easiest way to inadvertently produce a large error-margin is to speed up the time-scale. Reduce the error-margin by slowing down the time-scale. The margin of error varies depending on which planetary body is being observed in the context of the diverse physics theories. So each scenario is pre-set to time-scales with a low enough error-margin for its specific purpose. There is a deeper discussion of how the algorithm refines the error-margins later in the chapter.

Before assessing the results of the computer algorithms, a pertinent discussion at the core of the analysis is required. This concerns the difference between two terms: absolute and relative.

2

ABSOLUTE VELOCITY, RELATIVE VELOCITY – ORBITS AND ROTATION:

If rotational-velocity is absolute, then how can an orbital-velocity be relative?

It is quite clear and widely accepted that the rotation of a body around its own axis must be measured in absolute terms, and not relative terms (Feynman p.76). We can feel the effects of the centrifugal force quite markedly, and so we know that if a satellite in deep space is rotating, then astronauts will stick to the inner walls (simulating gravity). And if it is not rotating they will float in zero gravity. They will also be able to observe their rotation when they see the 'fixed' stars 'moving' past their window. The centrifugal force and the movement of the *window past the stars* will always coincide, absolutely. This is how we know that axial rotation is not a relative phenomenon. It is certainly absolute.

Now consider any perfectly balanced binary pair of stars (or planets). In this example they have the same mass – and their orbit is not elliptical – it is as perfectly circular as possible. If we carefully consider this hypothetical pair *in purely relativistic terms* then we can only reach the strange conclusion that they have in effect no velocity relative to one another – because the distance between them is *constant relative to one another*. But if they have no velocity relative to each another, then there would be mutual attraction from gravity – and they would accelerate towards one another and then collide!

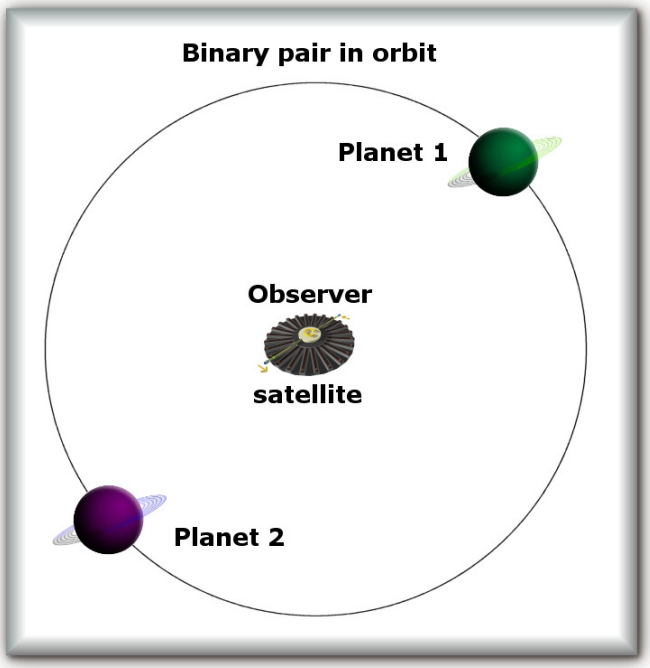
I have labelled this concept
BAOBAB: Bain's Absolute Orbit Binary Analytical Badinage.

It is only when we consider a binary pair to be moving compared to the 'fixed' stars – or when compared to a barycenter (midpoint) – that gravity is counteracted by that orbital motion. The binary stars are now able to maintain a constant distance from one another as binary orbits are supposed to. Their *absolute* orbital velocity is now perfectly balancing the gravity between them. And the idea of BAOBAB subverts the core concept of Relativity so

clearly, so clinically, that I can hardly wait in sheer mirth to hear the variety of sophistry that the compulsive Relativists will try and counter it with.

But we need to follow ***BAOBAB*** further. We have the widely accepted proof that the Earth's spin on its axis – being a rotation – is thus absolute and not Relative. So let us consider a satellite in a geosynchronous orbit – so that it orbits the Earth in exactly one day. This satellite is thus always directly above the same point on the surface of the rotating Earth, and it is also always the same distance from that point. So surely it makes sense to suggest that this satellite is moving in absolute velocity and not Relative velocity? Well the Relativists would certainly not agree. But in what critical sense are those two movements fundamentally different? What about the various points between the satellite and the surface of the Earth? Where are we supposed to draw that hypothetical line between Relative and absolute?

We can then also place an observer satellite precisely at the barycenter (midpoint) between a pair of planets in a binary orbit. The satellite has a constant rotation on its axis exactly equal to the time it takes the binary pair to orbit one another. We have the same resultant angular velocity for both the binary pair and for the axial rotation of the satellite – when compared to the fixed stars – or when comparing both these to the midpoint (barycenter).



If the binary pair stops orbiting each other (when compared to the fixed stars) they will attract one another because of their gravity and eventually squash the satellite between them. By the same token, if the satellite stops rotating compared to the fixed stars, the astronauts in the satellite will experience weightlessness before they get squashed (by the non-orbiting binary pair).

It is abundantly clear that if we only consider their orbit in purely Relative terms as regards one another – then there is no Relative velocity between them – and thus nothing to stop gravity pulling them together. The midpoint is a fundamentally necessary construct to the binary orbit, such that it is logically linked to the fixed stars in precisely the same absolute manner that a rotation is. So the midpoint is actually a fundamentally necessary third positional feature of a binary orbit.

That so many Relativists never noticed this – and will continue to ignore it – is more an issue of pedagogy and psychology than one of logic, math or science. Never mind the notion that the astrophysicist who cannot construct evolutionary algorithms to accurately

plot their theories on gravity, Relative or otherwise, is the academic equivalent of a mute illiterate English teacher. Thus it must be concluded that the orbital rotation of the binary pair is also only measurable in absolute terms. The Relativists will, of course, just choose to disagree (*because they are Relativists*).

But there is further empirical proof that an orbiting binary pair exhibits the same property of absoluteness that the satellite rotating on its own axis does. The gravity of the moon causes the tides of the Earth's oceans. But if it was only the gravity of the moon causing the tides then there would be only one high tide per day – when the moon is directly overhead. The second high tide of the day (when the Moon is underneath the Earth beneath our feet) is caused by the centrifugal force when the Earth rotates around the Earth-Moon barycenter (midpoint). You may need to think about this for a bit.

This hinges on the clear observation that the ocean on the side of the Earth furthest from the moon is forced away from the moon – counteracting gravity. What force can cause the high tide on the far side from the moon? The only answer is the centrifugal force. There really is no other viable candidate. The explanation must be that the rotation of the Earth around the barycenter between the Earth and the Moon is causing those oceans to be forced away from the centre by the centrifugal force.[3]

This is the same phenomenon that causes the astronauts to stick to the inside of the satellite when it spins on *its* axis: away from the centre of *their* axial rotation. So its not just axial-spin that is absolute, but orbital rotation too – because our initial proof of axial-spin being ***absolute*** is based on the objective and empirical reality of the centrifugal force coinciding precisely with the appearance of the fixed stars also rotating around the object when it is spinning.

But consider all of this in more common sense terms (for the die-hard Relativists). If our geosynchronous satellite is joined to the Earth by a *space-elevator*, is it part of axial rotation or orbital rotation? How thick must a joining bridge between the Earth and the satellite be before its velocity is considered Relative?

Just after a rocket launches, it is still part of the atmosphere, and most of its velocity is the same as the Earth's rotation. Is it Relative or absolute? At which point do you decide? What is the precise criterion that distinguishes axial rotation from other velocity? Is it the difference between solid and gas? What of liquids? The decision, no matter which way you cut it, is categorically arbitrary.

So how can we conclude that the orbital rotation under gravity does not have the same absolute nature that axial rotation does? Of course, the obstinate scholastic Relativist could still insist that neither of these consist of linear movements…

So let us, in the light of this, evaluate the results of the various aspects of the Relativities as they are applied in the OGS12 computer algorithm. I have not seen any other conclusive evidence that suggests an attempt to examine *precisely* how all the aspects of the theories of Relativity would alter the orbits of the individual planets when compared to Newtonian theory.

3

RELATIVITY AND MERCURY'S ORBIT:

As Mercury accelerates towards C, it loses expected velocity according to Special Relativity.

The easiest way to assess the accuracy of the orbits of the planets in the evolutionary algorithm OGS12 is to observe Scenario [18] which shows the orbit of Mercury according to Newtonian gravity at a time-scale of ***1:10 000***. The user can freely download the algorithm and observe all this data evolving in real-time. The error-margin at this time-scale

[3] The Earth and Moon are somewhat of a binary system such that they both orbit a point about 1740km below the surface of the Earth. This is the midpoint or barycenter of their shared orbital structure.

is 1 part in 40 million millions or 177mm after 20 orbits. That error-margin if 177mm is the difference in the distance from Mercury to the Sun after those 20 orbits at aphelion (maximum distance.)

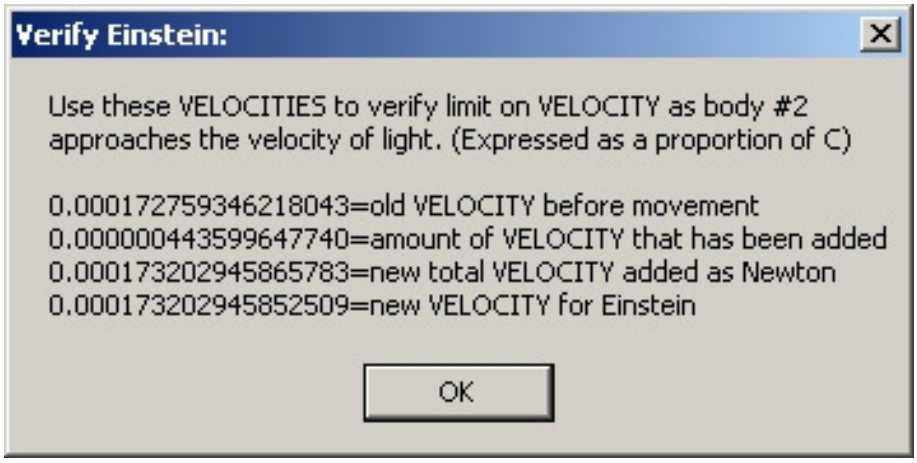
Next we select Scenario [5] which alters the orbit of Mercury by adding the principles of Special Relativity, such that accelerations towards the velocity of light are reduced away from the expected Newtonian result using the following formula:

Special Relativity velocity adjustment:

$$V = \frac{U + u}{1 + U*u}$$

All velocities must be measured as a proportion of the velocity of light, so that light-speed is v=1. The starting velocity 'U' is added with 'u' and the result is 'V' which is always less than 1.

The gravity simulator OGS12 gives the user the option to verify the details of this calculation by selecting the option 'Verify velocity C-limit.' under 'Physical Cosmology'. The Result looks like this:



So we can clearly see that Special Relativity results in a reduction in velocity when compared to Newton's laws. The net result is that when the orbit is at its nearest, Mercury moves closer to the Sun at a rate of 832 meters per orbit. Whereas at it's furthest, Mercury spirals inwards towards the Sun at a rate 1.92km per orbit as a result of this formula from Special Relativity.

Now the knee-jerk response from so many people is that this amount is counteracted by 'other parts of Relativity'. So Scenario [20] demonstrates the effect of General Relativity on Mercury's orbit, and Scenario [21] combines both Special and General Relativity.

However, General Relativity results in the nearest distance (perihelion) moving outwards at a rate of about 35 meters per orbit, and the outer distance (aphelion) moving outwards at about 50 meters per orbit. This is the result of BOGVOS, details of which are explained elsewhere. But in simple terms if gravity travels at the velocity of light then the small gravity of Mercury would pull the Sun in a direction about 9000km from the center of Mercury. This point would trail behind Mercury's position on its orbit-path due to a delay of about 4 minutes for gravity to move between the two.

Also, the Sun in reciprocation would not pull Mercury from its center, but from a point about 1 meter off-center – if gravity moves at the velocity of light. This may appear to be an insignificant amount, but only because Mercury is so small. Later you will see how vital this

calculation becomes when considering how Jupiter and the Sun's orbital structure is distorted away from the Newtonian shape.

As regarding Mercury and Special Relativity however, consider this data:

algorithm: orbit-gravity-sim-12.exe

```
[ 5 ]  Mercury's orbit under Special Relativity.
Time Rate: 1 user sec = 167 mins;  1:10000 time-scale
                                 Orbit # 2 drift
min km          45985802.758685  |          69819998.433839          km max
min dif               -.832135   |                -1.926577         dif max
                                 Orbit # 3 drift
min km          45985801.933475  |          69819996.512992          km max
min dif               -.825210   |                -1.920847         dif max
                                 Orbit # 4 drift
min km          45985801.114945  |          69819994.589086          km max
min dif               -.818530   |                -1.923905         dif max
```

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It is fairly easy to see that Mercury would be far more greatly altered by Special Relativity than General Relativity – if they were indeed actually applicable. The consequences of this will be discussed a bit later in this chapter. (The first orbit drift is ignored for purposes of establishing difference to the previous orbit, because there is no previous orbit. That is why the table starts with orbit #2)

algorithm: orbit-gravity-sim-12.exe

```
[ 20 ]  Mercury's orbit under General Relativity.
Time Rate: 1 user sec = 167 mins;  1:10000 time-scale
                                 Orbit # 2 drift
min km          45985803.446411  |          69820002.773691          km max
min dif               +.027430   |                +.043122         dif max
                                 Orbit # 3 drift
min km          45985803.481149  |          69820002.826926          km max
min dif               +.034738   |                +.053235         dif max
                                 Orbit # 4 drift
min km          45985803.523206  |          69820002.883707          km max
min dif               +.042056   |                +.056780         dif max
```

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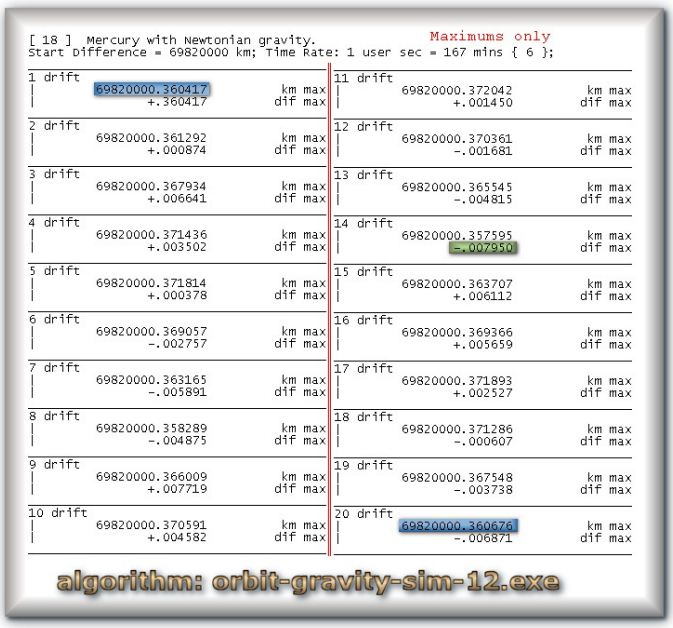
Some more info on this algorithm is forthcoming: 1 second for the user equals an evolution of 167 minutes for Mercury. This generates a polygon-orbit of about 50 000 iterations in a bit less than 15 minutes of computation per orbit. The result of the Newtonian Scenario [18] is a drift (or fluctuation error) in total of about 177mm after 20 orbits with each orbit representing about 360 million km distance covered.

An error-margin at this time-scale averaging about 1 part in 40 million millions is unexpectedly fantastic for an entry level PC built in 2014 using a quite standard programming language from 1998 (vb6). Slowing down the time-rate of the algorithm increases the number of sides in the orbit-polygon. This could improve the error-margin in these results even more. Speeding up the algorithm would of course be less accurate but faster to compute.

It is vital to see that the Newtonian margin of error diminishes with more orbits because the number of sides to the polygon does not precisely divide into the circumference of the orbit. So while there may be fluctuations as the algorithm progresses one orbit at a time, the net result eventually balances out. The final iteration at the end of each orbit may over-shoot past the starting point by different amounts from orbit to orbit, resulting in fluctuations that

over many orbits diminish quite considerably. The next table shows just the ***maximum*** distance of Mercury from the Sun under Newton for 20 orbits (Scenario [18]).



[18] Mercury with Newtonian gravity. Maximums only
Start Difference = 69820000 km; Time Rate: 1 user sec = 167 mins { 6 };

1 drift	69820000.360417	km max	11 drift	69820000.372042	km max
	+.360417	dif max		+.001450	dif max
2 drift	69820000.361292	km max	12 drift	69820000.370361	km max
	+.000874	dif max		-.001681	dif max
3 drift	69820000.367934	km max	13 drift	69820000.365545	km max
	+.006641	dif max		-.004815	dif max
4 drift	69820000.371436	km max	14 drift	69820000.357595	km max
	+.003502	dif max		-.007950	dif max
5 drift	69820000.371814	km max	15 drift	69820000.363707	km max
	+.000378	dif max		+.006112	dif max
6 drift	69820000.369057	km max	16 drift	69820000.369366	km max
	-.002757	dif max		+.005659	dif max
7 drift	69820000.363165	km max	17 drift	69820000.371893	km max
	-.005891	dif max		+.002527	dif max
8 drift	69820000.358289	km max	18 drift	69820000.371286	km max
	-.004875	dif max		-.000607	dif max
9 drift	69820000.366009	km max	19 drift	69820000.367548	km max
	+.007719	dif max		-.003738	dif max
10 drift	69820000.370591	km max	20 drift	69820000.360676	km max
	+.004582	dif max		-.006871	dif max

algorithm: orbit-gravity-sim-12.exe

In blue the 1st and 20th orbits show a difference of less than 1/5th of a meter between them, whereas in green, the 14th orbit drifts by almost 8m from the previous orbit. Notice that when a few orbits increase the distance, that is followed by a few orbits decreasing the distance – with consistent regularity – as the number of *polygons-per-orbit* averages out with a larger numbers of orbits. A deeper analysis of the nature of the error-margin is discussed in detail in Section 26 towards the end of the chapter.

4

RELATIVITY AND THE ORBITS OF ALPHA CENTAURI:

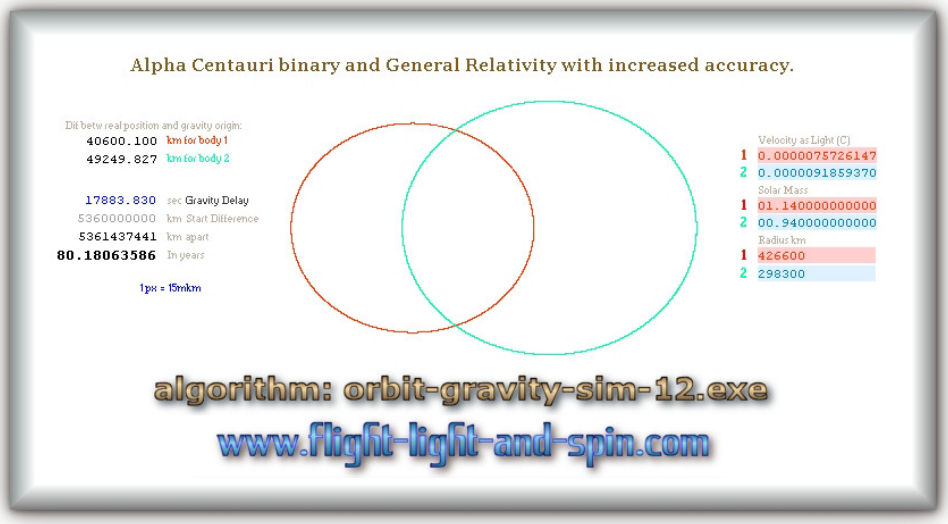
The Alpha Centauri binary pair and the gravity delay of General Relativity.

The most pronounced effect that gravity theoretically traveling at the velocity of light could have on an orbital structure happens to be in binary pairs because both objects have significant velocity. There is a gap between the object's *position* and the *gravity-origin* because of that higher velocity. So the force of gravity would not pull to where the other body *is*, but to where the other body *was* when the gravity left that body – if gravity traveled at velocity. The further gravity has to travel, the wider this gap becomes, as a gravity-delay.

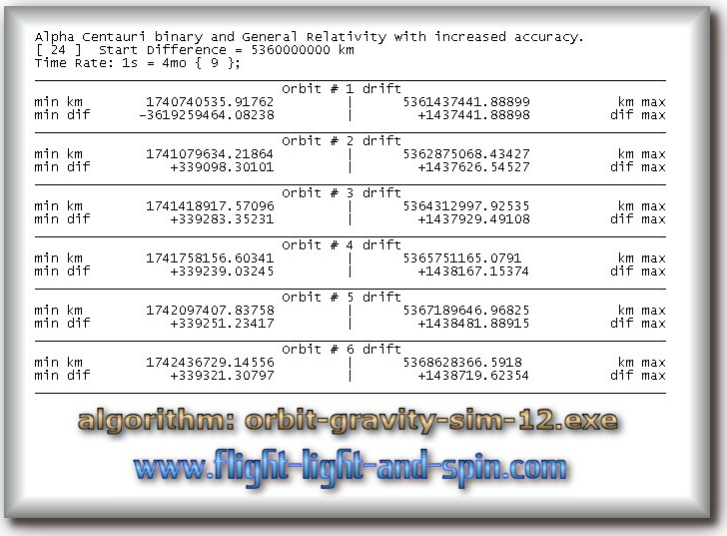
Scenario [2] applies gravity traveling at the velocity of light to the Alpha Centauri system. The stunning result is that if gravity traveled at the velocity of light, there would be a gap between the position of each star and the opposite gravity-origin of more than 40 000 km. This would result in an outwards spiral of over 1.4 million km per orbit.

Scenario [29] is a purely Newtonian orbit that yields a margin of error such that the orbit drifts a mere 55m over 18 orbits where the pair orbits a maximum distance apart of over 5 thousand million km. The algorithm can improve on that if it runs at slower rate; but that is clearly not required. 3 minutes of user-time per orbit is an optimal balance between accuracy and expediency. Scenario [30] shows that Special Relativity's imposition of a limit at the velocity of light would lead to an inwards spiral for the Alpha Centauri binary of a mere 7km per orbit.

General Relativity would thus have an effect 200 000 times more than Special Relativity on the orbits of Alpha Centauri. Scenario [24] is similar to Scenario [2] but it runs 10 times slower with 100x more accuracy:



As can be seen the difference between the ***position*** and the ***gravity-origin*** fluctuates from 40 to 47 thousand kilometers for one star, and from 50 to 57 thousand for the other. It would take almost 5 hours for the gravity to cross the space between them at furthest and about one and a half hours when they are closest. The results are magnificently problematic for the Relativists:



```
Alpha Centauri binary and General Relativity with increased accuracy.
[ 24 ]  Start Difference = 5360000000 km
Time Rate: 1s = 4mo { 9 };
____________________________________________________________________________
                              Orbit # 1 drift
min km        1740740535.91762        |       5361437441.88899          km max
min dif      -3619259464.08238        |         +1437441.88898         dif max
____________________________________________________________________________
                              Orbit # 2 drift
min km        1741079634.21864        |       5362875068.43427          km max
min dif          +339098.30101        |         +1437626.54527         dif max
____________________________________________________________________________
                              Orbit # 3 drift
min km        1741418917.57096        |       5364312997.92535          km max
min dif          +339283.35231        |         +1437929.49108         dif max
____________________________________________________________________________
                              Orbit # 4 drift
min km        1741758156.60341        |       5365751165.0791           km max
min dif          +339239.03245        |         +1438167.15374         dif max
____________________________________________________________________________
                              Orbit # 5 drift
min km        1742097407.83758        |       5367189646.96825          km max
min dif          +339251.23417        |         +1438481.88915         dif max
____________________________________________________________________________
                              Orbit # 6 drift
min km        1742436729.14556        |       5368628366.5918           km max
min dif          +339321.30797        |         +1438719.62354         dif max
____________________________________________________________________________
algorithm: orbit-gravity-sim-12.exe
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```
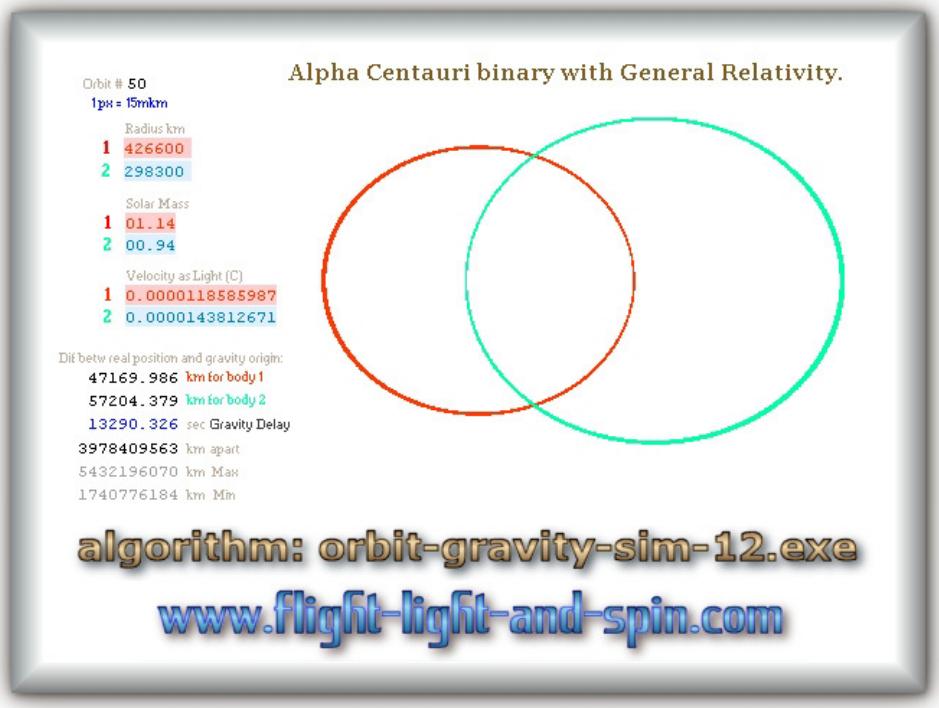

Not only will the Alpha Centauri pair move apart at more than 1.4 million km per orbit because of gravity traveling at the velocity of light, but the amount of change is *itself increasing* by hundreds of km each orbit. The outer distance increases much faster than the inner distance, thus the pair becomes more eccentric with each orbit.

The outwards spiral of 1.4mkm per orbit is big enough to be visible on the scale of the computer-screen, which is here depicted as being 1 pixel = 15mkm. So they move apart by about 1 pixel every 11 orbits:



When compared to the previous depiction of this binary, the orbit-lines have both visibly become thicker at the outer limits after 50 orbits as they move away from one another. But it is most apparent when watching it generate in real-time.

So how long will it take before they fall apart completely? What would the life-span be of the Alpha Centauri binary under the Relativistic notion of gravity traveling at the velocity of light? To answer this I constructed Scenario [25] which starts the pair a distance apart equal to the distance from the Sun to Mercury. That is about 100 times less than the distance between the Alpha Centauri binary in reality. At the distance scale of 1 pixel=150 000km, the outward drift caused by General Relativity is almost exactly 1 pixel per orbit and quite noticeable.

The eccentricity is increasing in this example, so in order to attempt to get the required eccentricity when they obtain a distance of 5300 million km (like they are supposed to be) I start them with a more circular shape in Scenario [26]. In the previous chapter, I estimated through arithmetical progression that it would take such a pair ***20000*** orbits to out-spiral from within a Mercury-orbit to beyond a Pluto-orbit. Scenario [26] aims to check that approximation computationally. I set this scenario at a time-scale-ratio of 1:10 million, because I don't have millions of years to wait, so the error-margin is pushed to an unhealthy 4%. But at least 4 months pass by in 1 second.

After 500 orbits, they have expanded from about 50mkm to 100mkm apart (Venus's orbit).
After 800 orbits they're at Earth's orbit: 150mkm, taking a mere 250 years (or 12 minutes).
After 2548 orbits they have reached their *proper* separation of 530mkm, taking 4000 years.

Scenario [2] takes over now; and I increase the time-rate-scale to 1:1 000 000 000, so that 32 years passes by in 1 second. An additional 2578 orbits passes before their point of separation exceeds the 1000mkm mark; albeit taking a lot longer – 340 000 years to expand this far. At beyond the orbit of Pluto the pair have progressed a total of merely about ***5000*** orbits from their starting point at the orbit of Mercury. The estimate from the earlier chapter (of 20 000 orbits) was much too conservative (as any good controversial estimate should be).

It is highly unlikely that 4000 years ago, the Alpha Centauri binary were once a single star that *somehow* split in half. Moreover various estimates suggest that half the stars in the sky are binaries, and many of them are thousands of light-years away. They would all have to have originated in an oddly peculiar set of coincidences to be observed as binary orbits from our position in space and time. Here are selected orbits from Scenario [26] and [2].

```
Pseudo-Alpha Centauri binary with Relativity
starting 100x closer than in reality,
but with less eccentricity.
[ 26 ]  Start Difference = 53600000 km
Time Rate: 1s = 4mo { 9 };

Orbit
# 10 drift
|        58673438.786621          km max
|          +91170.238530         dif max

# 100 drift
|        66919818.172089          km max
|         +102372.954560         dif max

# 500 drift
|       111204500.820824          km max
|         +122422.015626         dif max

# 1000 drift
|       183837826.058582          km max
|         +162618.181410         dif max

# 1500 drift
|       276187649.500941          km max
|         +203858.511105         dif max

# 2000 drift
|       388797356.583984          km max
|         +245956.184704         dif max

# 2548 drift
|       536177109.877793          km max
|         +292184.294409         dif max
```

Maximums only

```
Alpha Centauri binary with applied
equations from Relativity.
[ 2 ]  Start Difference = 5360000000 km
Time Rate: 1s = 32 yrs { 11 };

Orbit
# 10 drift
|       5359890563.40959          km max
|         +1480749.630106        dif max

# 101 drift
|       5490892574.55493          km max
|         +1499385.378639        dif max

# 500 drift
|       6091717389.81428          km max
|         +1525515.417804        dif max

# 1000 drift
|       6908102179.33123          km max
|         +1691093.763381        dif max

# 1500 drift
|       7799242109.53992          km max
|         +1820722.828021        dif max

# 2000 drift
|       8772116544.43107          km max
|         +2033015.848859        dif max

# 2620 drift
|      10094950098.6668           km max
|         +2253887.183774        dif max
```

Differences in maximum km apart (above) only reflect the difference between the current and previous orbit number, and not the orbit listed above it in this limited and edited selection. The user may want to improve on these results with better accuracy at slower time-rate-scales using the gravity-simulator ***orbit-gravity-sim.12.exe*** – or build your own if you care to dispute this. But the case for gravity-velocity and General Relativity is looking bleak, from the perspective of purely logical computation.[†]

5

RELATIVITY AND THE ORBIT OF JUPITER:

Jupiter and the Sun are a binary system that orbits a point outside the circumference of the Sun.

Strictly speaking Jupiter and the Sun are a binary system, albeit with a mass-ratio difference of about 1:1000. So because they both orbit a point outside the Sun's circumference, the Sun itself has quite a marked velocity due to the gravity of Jupiter. Now because the gravity of both bodies would be delayed if that gravity travels at the velocity of light, they will both be attracted to a point, behind the position of the opposing body.

How this would hypothetically alter the orbit of Jupiter is computed in Scenario [3] and [4] in the OGS12 algorithm (***orbit-gravity-sim-11.exe***). These scenarios run at the time-rate-scale of 1:1 million, completing its virtual 12 year orbit in 6 minutes for the user.

The margin of error amounts to less than +-0.2km per orbit due to a 25000 sided polygon-orbit. If the user wishes to improve on these error-margins, simply run the scenario at a slower-rate but the algorithm will complete each orbit in an hour rather than 6 minutes.

Scenario [4] demonstrates the orbit of Jupiter if gravity has the same velocity that light does, according to General Relativity. This shows that the innermost part of Jupiter's orbit should be receding from the Sun at over 767km per orbit. (Or 63km per Earth-year.) The outermost part of the orbit would recede at over 860km per orbit.

This large amount is due to the binary nature of the Jupiter-Sun orbital structure. The Sun wobbles due to Jupiter's gravity, and if that gravity takes about 40-45 minutes to traverse the distance between them, then the Sun would be pulled to a point more than 30 000 km

[†] Although from a careerist sophistic perspective, the answers will differ.

behind the center of Jupiter, whereas Jupiter would be pulled to a point more than 30km behind the center of the Sun.

The algorithm also computes the difference generated by Special Relativity to the orbit of Jupiter. Start Scenario [3] and then simply clicking the option 'Special Relativity' under 'Physical Cosmology'. The result is that the outer limit of the orbit will gently spiral inwards at about 0.28 km per orbit as Jupiter accelerates slowly towards the velocity of light. This is due to the alleged loss in velocity that Special Relativity suggests any accelerating object undergoes.

Here is the data for how the orbit of Jupiter is influenced by the various computations as regards gravity in the 3 different situations:

```
The distance of Jupiter from the Sun under different gravity theories.

Jupiter + Newton
-------------------------------------------------------------------------------
                                orbit # 2 drift
min km          743277143.153941        |        816600119.069294          km max
min dif                 +.110589        |                +.010484         dif max
-------------------------------------------------------------------------------
                                orbit # 3 drift
min km          743277143.264368        |        816600119.193724          km max
min dif                 +.110426        |                +.124430         dif max
-------------------------------------------------------------------------------
                                orbit # 4 drift
min km          743277143.064418        |        816600119.143321          km max
min dif                 -.199949        |                -.050403         dif max
-------------------------------------------------------------------------------
                                orbit # 5 drift
min km          743277143.075493        |        816600118.949921          km max
min dif                 +.011075        |                -.193399         dif max
-------------------------------------------------------------------------------
                                orbit # 6 drift
min km          743277143.297527        |        816600119.156807          km max
min dif                 +.222033        |                +.206886         dif max
-------------------------------------------------------------------------------
                 An error-margin of about +-0.2km per orbit.


===============================================================================
Jupiter + Einstein's General Relativity.
-------------------------------------------------------------------------------
                                orbit # 2 drift
min km          743278295.20919         |        816601737.935267          km max
min dif             +767.79626          |            +868.473380         dif max
-------------------------------------------------------------------------------
                                orbit # 9 drift
min km          743283669.018662        |        816607793.119996          km max
min dif             +767.705801         |            +883.858118         dif max
-------------------------------------------------------------------------------
                            total after 7 orbits
                     +5374 km                          +6055 km
-------------------------------------------------------------------------------
                 avg +767.7 km per orbit         avg  +865 km per orbit


===============================================================================
Jupiter + Special Relativity
-------------------------------------------------------------------------------
                                orbit # 1 drift
min km          743277142.790516        |        816600119.05881           km max
-------------------------------------------------------------------------------
                                orbit # 7 drift
min km          743277141.362549        |        816600117.357677          km max
-------------------------------------------------------------------------------
                            total after 6 orbits
                      -1.428 km                         -1.7 km
-------------------------------------------------------------------------------
                    avg -.023 km per orbit         avg -0.28 km per orbit

algorithm: orbit-gravity-sim-12.exe
www.flight-light-and-spin.com
```

In addition to these I also generated a pseudo-Jupiter orbit in Scenario [27]. By placing Jupiter at the Earth's orbit it can be seen how long it would take this pseudo-Jupiter to drift outwards towards its current position – if General Relativity is correct in proposing that gravity travels at the velocity of light.

The result of Scenario [27] is that if it were 150mkm from the Sun, Jupiter would recede away from the Sun at a rate of 370km per orbit – but that amount increases with each orbit. So comparing this with the outwards movement from Scenario [4] at 760km to 860km per orbit (60km per year), and Jupiter's real orbit at 600mkm away from the Earth, it would take somewhere between 1.6 million years and 10 million years for Jupiter to spiral outwards from the Earth's orbit to its current real position – if gravity travels at the velocity of light. I'm going to estimate an amount of about 4 million years. Sounds unlikely, surely?

Well it was not my idea that gravity travels at the velocity of light, I am just computing the geometrical consequences of *that* theory.

But where would the Earth have been 4 million years ago?

6

RELATIVITY AND THE ORBIT OF EARTH:

How does Special Relativity and General Relativity effect the orbit of the Earth?

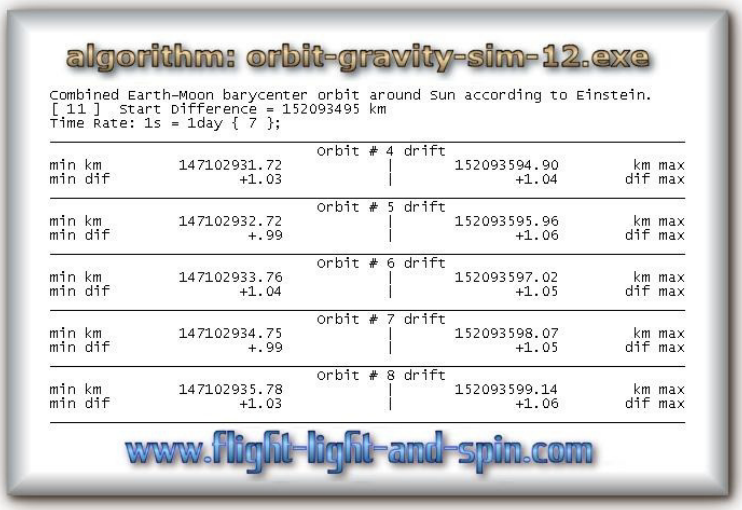
A tricky thing about computing the orbit of the Earth – is that the Moon's gravity wobbles the Earth by as much as 9282km per month. There is uncertainty as to what the perihelion and aphelion of the barycenter actually are because the numerous websites looked at do not account for the change that the Moon causes to the Earth's position from the Sun.

Typically the Earth is said to be at a maximum of 152 098 232km from the Sun. But if we take the *maximum* to be at New Moon it could be 4641km more than that. Alternatively, that amount could be the maximum *including* the 4641 caused by the Earth's wobble at New Moon. So I have taken the claim to the maximum distance quite literally. But it matters little as a matter of principle in examining the effect of Relativity on the Earth's orbit because the changes made by the Relativities are *proportional* to those amounts.

To simplify this problem, the algorithm ***orbit-gravity-sim-12.exe*** (OGS12) only maps the orbit of the Earth-Moon barycenter around the Sun. The maximum and minimum distances (aphelion and perihelion) of the *orbit* are thus taken to be a bit closer together than the widely published claims as to the parameters of the Earth's orbit. The mass contained by this orbit is then also the sum of both the Earth and the Moon. Future algorithms will demonstrate solutions to the many-body-problem (n-body-problem) so that it can be seen how the Moon, Earth and Sun alter one another's orbits by exact amounts. But one thing at a time!

Scenario [10] of the OGS12 algorithm shows the natural Newtonian orbit with an error-margin of +-0.026km per orbit averaging to +-0.0003km (about 1 foot!) per orbit over 16 orbits. This error-margin is due to the orbit being a polygon of about 21000 sides. I will examine detail as to how this occurs later in the chapter.

Scenario [11] shows that the Earth's orbit will be influenced by both Special Relativity and General Relativity to the extent of an outwards drift of a bit more than 1km[∀] per orbit:



[∀] If you run the software yourself you can increase the accuracy of these results by increasing the time scale in the algorithm from 1 user-second = 1 day (6 minutes per orbit) to 10 times that.

So gravity-velocity from General Relativity has a larger impact on this orbit than does a loss in velocity from Special Relativity (unlike Mercury – see section 3). The outwards spiral of 1km per orbit (if gravity travels at the velocity of light) would be due to the reciprocal delay of about 500 seconds between the forces of gravity between the Sun on the one hand and the Earth-Moon system on the other hand. The Earth and Moon would both be attracted to a point 44m on the orbit lagging behind the Sun's center whilst the Sun would be pulled to a point 15000km behind the Earth-Moon barycenter.

In the previous section we had Jupiter drifting outwards from the Sun at such a prolific rate (about 800km per orbit) because of General Relativity, that if such a theory as gravity traveling at the velocity of light is true, then Jupiter would have been situated in the Earth's orbit a mere 4 million years ago. At that point Jupiter would have been drifting away from the Sun at 370km per orbit.

The only way that would work is if the Earth was at this point a moon of Jupiter. But then Jupiter would have been well within the orbit of Mercury a few thousand years prior to that, which is not at all in keeping with the basic records of geology and paleontology. The entire Solar system (in this context) would be only about a quarter of a million years old. So the conclusion could be that gravity does not travel at the velocity of light.

However there is the outside chance that Jupiter is a new arrival in the solar system. But in this situation, with the Earth moving outwards at only 1 km per year – 150 mkm from the Sun, we still have massive problems. It just does not seem feasible that the Earth was at the orbit of Mercury less than 100 million years ago. What a mess gravity-velocity is causing! But as a logical positivist I can assume nothing, and must prove everything, however unlikable the calculations are. So the next section shows the Earth-Moon binary in detail.

7

RELATIVITY AND THE ORBIT OF THE MOON:

Why are the exact parameters of the Moon's orbit so hard to come by?

Up until now I had been using NASA's planetary fact-sheet[‡] as the most likely source of detailed data. A troubling problem on that web-page is that whilst NASA is making the famous claim of a 36mm recession of the Moon's orbit from the Earth per year, it also only gives the Moon's orbit rounded off to the nearest thousand kilometres!

A search for more accurate data shows a huge diversity of opinion as to what the Moon's distance from the Earth actually is. Various websites show discrepancies of many thousands of kilometres for both the nearest and furthest distance. It is quite a raging debate. Some claims are that the eccentricity is changing, the maximum and minimum distances are varying from orbit to orbit; and that this is all a consequence of the other planets and the Sun too. Others suggest that the gravitational constant (G) 'is changing'! That may be a semantic impossibility, but most interestingly, even the gravitational constant cannot be agreed upon beyond the second decimal place.

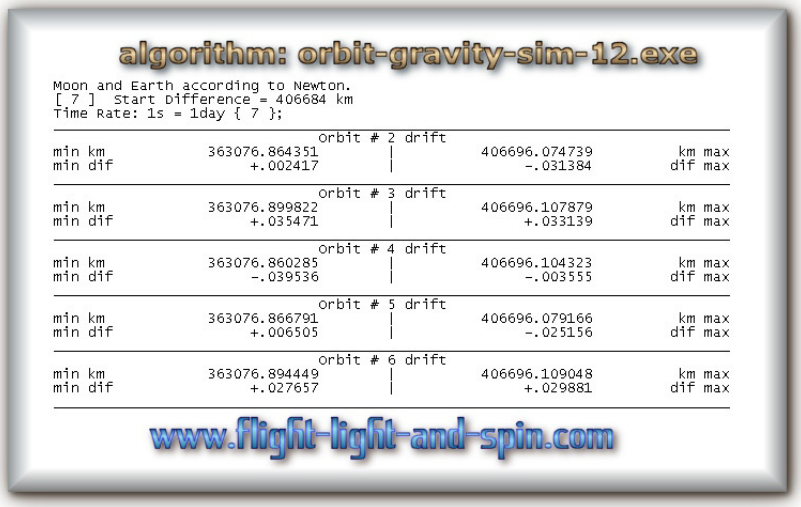
I can see no consistency to any of it – and endless possibilities. So those details will have to wait for another chapter to be tackled more thoroughly. Seeing as I do have an algorithm which promises to demonstrate the exact consequences of n-body gravity; I'm in a prime position to evaluate *that* problem, most specifically the exact effect that the Sun, Jupiter and Venus have on the Moon's orbit.

So for now the exact details of the Moon's orbit used by the algorithm ***orbit-gravity-12.exe*** (OGS12) will be assumed as being 363 104km to 406 700km[♣]. The effect of Relativity on the Moon's orbit is always going to be proportional. So altering those amounts will not result in different consequences as to how Relativity changes orbits *in principle*.

[‡] https://nssdc/gsfc/nasa/gov/planetary/factsheet/index.html

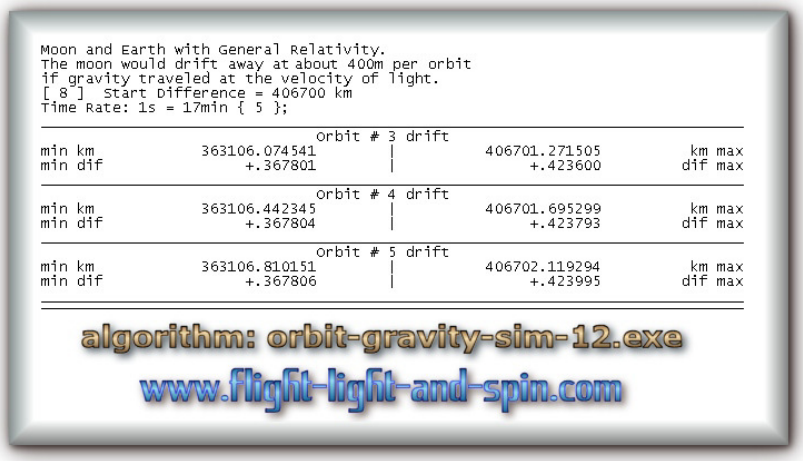
[♣] www.Universetoday/103206/what-is-the-distance-to-the-moon/

So let us look at how the Newtonian Scenario [7] demonstrates a deviation of just a matter of meters even when the moon orbits at a time-rate of 1:100000. This is a nice scenario to observe evolving, because at this scale one can see the diameters of the Moon and the Earth clearly. The wobble that the Moon's gravity causes on the Earth is also visible on the computer screen here.



Also note that Scenario [6] improves on Scenario [7] because it has 10 times more sides to the polygon-orbit and thus it demonstrates an error-margin of less than half-a-meter per orbit. Scenario [6] calculates at the same time-scale as Scenario [8] which then also adds the velocity of gravity from General Relativity to the orbit of the Moon.

Even though it is fairly easy to improve on this error-margin by increasing the number of sides to the orbit-polygon, there is no real need here, because the fluctuation caused by gravity-velocity dwarfs the error-margin by 100 times. The results of Scenario [8] are superb:



The outwards spiral of about 400m per orbit would be due to the reciprocal delay between the forces of gravity between the two bodies. The Moon would be attracted to a point 16m from the Earth's center at an earlier point on the orbit-path; whilst the Earth would similarly be pulled by the Moon to a point 1.3km away from the Moon's center – if gravity travels at the velocity of light.

At this rate: an outwards spiral of 400m per orbit, the Moon would have separated from the surface of the Earth less than 70 000 years ago. It is starting to look like the book of Genesis is more literally correct than gravity travelling at the velocity of light! At least, six days of

Creation begins (tongue in cheek) with the Earth already in existence before time begins to be counted. Genesis makes no claim as to the age of the Moon or the entire Universe.

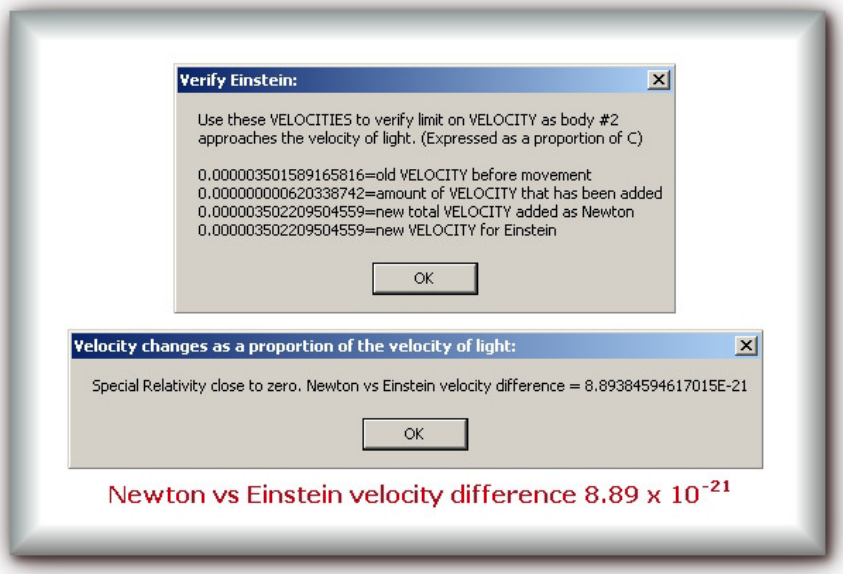
That God or aliens built the Earth with built-in fossil records to make it *appear* as if it had been around for much longer than it has, is still somewhat *possible*, however improbable or outlandish.[Ψ] But gravity moving at the velocity of light absolutely contradicts the idea of the Earth being over 4 billion years old.

So how is the Moon's orbit influenced by Special Relativity? Scenario [9] is right on the edge of what is measurable in this algorithm because the velocity of the Moon around the Earth is quite slower (1 km/s) than the velocity of the Earth and Moon together around the Sun (30km/s).

And here is where Special Relativity shows another blatant contradiction: If we take the velocity of the Moon to include the velocity that the Moon has around the Sun, then the Moon's velocity here is much closer to the velocity of light – and thus it would be more greatly altered by the reduction in velocity from Special Relativity!

This is because adding velocity to a higher starting velocity results in a greater reduction away from the velocity of light, than it would be when adding that same velocity to a starting velocity which is much lower.

This became quite clear when constructing the OGS12 algorithm – because the algorithm really struggles to detect any velocity changes in Scenario [9]: the effect of Special Relativity on the orbit of the Moon. The user can select the options marked ***'Verify Velocity C-Limit'*** under 'Physical Cosmology' (top right corner) whilst running Scenario [9] to see the following functions:



Note for the 'Verify Velocity C-Limit' option, in the evolving algorithm a square appears when Special Relativity is operating. This square is either: orange, green or red. When it is orange, then Special Relativity is on the edge of what is detectable by the software: smaller than the 18th decimal place. (Red is not a viable reduction, whereas Green is a viable velocity reduction above the 18th decimal point). I'll get back to this a bit later.

So detecting changes in the Moon's orbit because of Special Relativity is much more difficult than any of the other changes mentioned so far. This is because in this particular

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[Ψ] We must not exclude the possibility that our world is just a sophisticated prop in an alien space-drama, an alien theme park, or perhaps just constructed as a really funny joke whereby God pokes fun at aTheist souls.

scenario the change in distance for each calculation is very close to the polygon-orbit error-margin in the algorithm when noting the difference between Newton's theory and Einstein's theory. If we reduce the time-rate to improve the Newtonian error-margin, then the change in velocity caused by Special Relativity gets excruciatingly small and falls below the 18th decimal point.

If we use more calculations for each orbit, (running the algorithm more slowly) then the computational velocity in terms of pixels per calculation is reduced. This is due partly to the Moon orbiting the Earth even more slowly than Jupiter orbits the Sun, but also partly due to the computer working in its own parameters which need to be scaled accordingly. So we cannot simply compare successive orbits in a single scenario. So instead the 100th orbit of the Newtonian Scenario [7] is compared to the 100th orbit for Special Relativity in Scenario [9]:

It seems like a drift inwards of about 1mm per orbit (13mm per year) is still comparable to NASA's famous 38mm per year outwards drift as regarding scale.

Incidentally in a previous chapter, it was shown that if the Universe is 14 billion light-years across, and expanding at the velocity of light, then the gap between the Moon and the Earth would be expanding by about 24mm per year. That expansion dynamic should be carefully considered by anyone claiming that the Universe is expanding at any other rate, or has any other size or age. (A discussion on the size of the Universe comes a bit later).

A previous much simpler simulator I built a few years ago: ***orbit-game-5.exe*** (OG5) has already demonstrated that the Sun will be pulling the Moon away from the Earth, but nothing was evaluated to scale in that model. The more questions I answer, the more questions are raised. Future algorithms are being planned at a far faster rate than I can build them and document their progress.

8

RELATIVITY AND THE ORBIT OF MARS:

Are oscillations in the eccentricity of orbits, computational, or real?

This section uses the algorithm ***orbit-gravity-sim-12.exe*** firstly to show how the velocity adjustment from Special Relativity alters the orbit of Mars. It also demonstrates how the polygon error-margin occurs in Newtonian gravity (in conjunction with quantum-time).

I am suggesting that because the number of sides in the orbit-polygon in this algorithm fits *almost exactly* into one orbit, a process occurs by which the data reveals that for 14 orbits, the orbit becomes increasingly eccentric, and after that it turns around and becomes more

circular for 28 orbits. Theoretically the orbit should oscillate like this indefinitely, maintaining an average distance from the Sun throughout. (See Scenario [16] running at a time-ratio of 1:1 million).
So for the first 14 orbits, the maximum increases while the minimum decreases, after which they switch around. So after 28 orbits, the maximum and minimum are almost back where they started. This is explained in more detail in Section 27 (Using OGS12). Here is some numerical detail from Scenario [16]:

```
Mars with Newton.
[ 16 ]  Start Difference = 249230000 km
Time Rate: 1 user sec = 12 days { 8 };
------------------------------------------------------------------------
                              Orbit # 1 drift
min km          206578271.232447        |       249230639.540374          km max
min dif         -42651728.767552        |            +639.540373         dif max
------------------------------------------------------------------------
                              Orbit # 2 drift
min km          206578270.699914        |       249230639.920967          km max
min dif                 -.532533        |               +.380593         dif max
------------------------------------------------------------------------
                              Orbit # 3 drift
min km          206578270.210271        |       249230640.272092          km max
min dif                 -.489643        |               +.351124         dif max
------------------------------------------------------------------------

------------------------------------------------------------------------
                              Orbit # 14 drift
min km          206578267.655266        |       249230642.18949           km max
min dif                 -.017802        |               +.026960         dif max
------------------------------------------------------------------------
                              Orbit # 15 drift
min km          206578267.680364        |       249230642.186988          km max
min dif                 +.025097        |               -.002502         dif max
------------------------------------------------------------------------

------------------------------------------------------------------------
                              Orbit # 28 drift
min km          206578271.910013        |       249230639.472698          km max
min dif                 +.582726        |               -.385607         dif max
------------------------------------------------------------------------
```

Pay special attention to the parts highlighted in red, which represents the maximum distance from the Sun which Mars has fluctuated after the 28th orbit: about 67 meters. This is an average of just 2.5m per orbit over the 27 orbits. However, for the individual orbit #3 the distance from Mars to the Sun fluctuates by 380 meters. (Ignore the orbit #1 differences as they have no previous orbit to differ from, and just reflect the difference from the start).

Can you see how the orbit will become more eccentric due to the quantum nature of orbital polygons from orbit #1 to orbit #14? And then from orbit #15 onwards, they now become less eccentric. But the key concept is that this effect is simply a coincidence within an error-margin caused by the computer algorithm. If the time-rate is changed so that the software generates an orbit with a different number of sides to the polygon, then the phenomenon simply disappears. If you want the full data of all the orbits, you can generate it in the software yourself. Or see this link: www.flight-light-and-spin.com/simulator/mars.txt

The next table shows detail of 28 orbits of Mars under Special Relativity. I have taken a similar orbit sample to the previous one. Scenario [17] follows:

```
Mars with Special Relativity.
[ 17 ]  Start Difference = 249230000 km
Time Rate: 1 user sec = 12 days { 8 };
-----------------------------------------------------------------------------
                              Orbit # 1 drift
min km        206578270.770656        |       249230639.540374          km max
min dif       -42651729.229343        |            +639.540373         dif max
-----------------------------------------------------------------------------
                              Orbit # 2 drift
min km        206578269.775994        |       249230639.248025          km max
min dif              -.994661         |               -.292348         dif max
-----------------------------------------------------------------------------
                              Orbit # 3 drift
min km        206578268.82398         |       249230638.926406          km max
min dif              -.952014         |               -.321619         dif max
-----------------------------------------------------------------------------

-----------------------------------------------------------------------------
                              Orbit # 14 drift
min km        206578261.187427        |       249230633.442231          km max
min dif              -.478044         |               -.646956         dif max
-----------------------------------------------------------------------------
                              Orbit # 15 drift
min km        206578260.752921        |       249230632.765389          km max
min dif              -.434506         |               -.676841         dif max
-----------------------------------------------------------------------------

-----------------------------------------------------------------------------
                              Orbit # 24 drift
min km        206578258.813805        |       249230625.320545          km max
min dif              -.039314         |               -.948113         dif max
-----------------------------------------------------------------------------
                              Orbit # 25 drift
min km        206578258.818778        |       249230624.342032          km max
min dif              +.004972         |               -.978513         dif max
-----------------------------------------------------------------------------
                              Orbit # 26 drift
min km        206578258.868116        |       249230623.333069          km max
min dif              +.049337         |              -1.008962         dif max
-----------------------------------------------------------------------------
                              Orbit # 27 drift
min km        206578258.961887        |       249230622.2936            km max
min dif              +.093771         |              -1.039468         dif max
-----------------------------------------------------------------------------
                              Orbit # 28 drift
min km        206578259.100172        |       249230621.223583          km max
min dif              +.138285         |              -1.070017         dif max
-----------------------------------------------------------------------------
```

As can be seen, the orbit of Mars is also fairly eccentric so it reflects a significant adjustment due to Special Relativity. The total outward drift from the polygon error does not switch around at orbit#14 and orbit#15 like it does under Newton (Scenario [16]).

Instead by orbit #28, Mars is 18km closer to the Sun. This is about 2/3rd of a kilometre per orbit on average that Mars would be moving towards the Earth's orbit – if the limit at the velocity of light from Special Relativity causes a decrease in expected velocity.

With Mars being 54 mkm away from the Earth, and the effect of Special Relativity on the orbit of the *Earth* being an inwards spiral of only about 100m per year, we can expect Mars to collide with the Earth in about 60 million years – but if and only if – Einstein's theory of Special Relativity is correct. The effect of Special Relativity on the orbit of the Earth being about 100m per orbit is much less than it is on Mars because the Earth's orbit is less eccentric than Mars' orbit is.

Now in the previous chapter I highlighted several interpretations of how the Special Relativity's limit on the velocity of light is calculated.

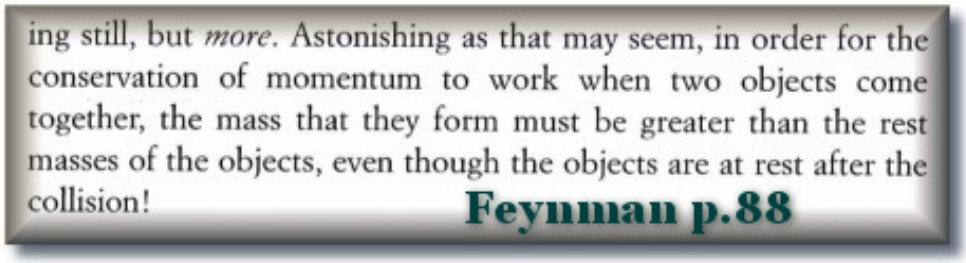
Special Relativity velocity adjustment:

$$V = \frac{U + u}{1 + U*u}$$

All velocities must be measured as a proportion of the velocity of light, so that light-speed is v=1. The starting velocity 'U' is added with 'u' and the result is 'V' which is always less than 1.

Special Relativity also claims that this loss in energy has to be compensated with an increase in the mass of the object – in order to preserve the conservation of energy principle[Ω]. Moreover Feynman concludes that if the added velocity ('u' in the formula above) is negative, then the formula is not reversible. So for him 'u' *must* be a positive number. No mass is lost or velocity gained if the object *decreases* away from light-speed.[Δ]

On p.88 of Six Not-so-easy-pieces, Feynman discusses how two objects collide under the principles of Special Relativity:



Now Miles Mathis disagrees with Feynman on this point. For Mathis, 'u' *can* actually contain a negative number. This would mean that Mars will not be colliding with Earth in 60 million years time. Mathis' evaluation of Special Relativity[μ] is wholly more logically acceptable – because Feynman's interpretation would result in the Earth's orbit being about 30 million kilometres further from the Sun 300 million years ago. If this were true then the dinosaurs would have been living in an extremely frigid ice-age.

So Mathis can not only 'save' the Earth from a horrible collision with Mars, but he could also save some face for the Relativists. It is vital to see that Mathis' interpretation is not the standard one. Note how the standard concept specifically considers an 'approach' to the velocity of light, and not a decrease away from the velocity of light. But what truly amazes me is that nobody ever seems to have considered that a decrease in velocity will cause an orbit to spiral inwards.

9

THE EFFECT OF GRAVITY-VELOCITY ON THE ORBIT OF VENUS:

Does the gravity of Venus significantly alter the position of the Sun?

I am going to use the orbit of Venus to explain in detail how the ***orbit-gravity-sim-12.exe*** (OGS12) algorithm calculates the effect of gravity travelling at the velocity of light from General Relativity. Programming General Relativity is all about determining the direction of the gravity-origin. This gravity-origin will be different from the position of the bodies in an orbital structure due to the velocity of those bodies and the alleged velocity of gravity.

Binary systems have a large difference between the position and gravity-origin due to both objects having significant velocity. But even the comparatively small gravity of Venus has an impact on the position of the Sun, oscillating it between 6 or 7 km per orbit at a pedestrian pace of about 86mm per second (which is about the speed of a tortoise in a hurry).

Now it takes 6 minutes to travel at the velocity of light from Venus to the Sun. So if gravity travels at the velocity of light, Venus will be pulled to a point about 31m away from the centre of the Sun. (0.086 m/s **x** 360s = 31m). Of course, the impact that the small gravity of Venus has on the Sun is also delayed. So how could those tiny amounts change the orbit of Venus?

[Ω] Mass alteration has been thoroughly discussed earlier in Chapter XXVII – 'Relativity Revised'.

[Δ] How this is computed is discussed earlier in Chapter XXIX – 'Analysis of GW150914'.

[μ] www.milesmathis.com/rel4.html

Scenario [22] calculates that according to *Newtonian* gravity, if Venus is at a distance of
108940965.221028km after 1 orbit – then it is:
108940965.221242km after 10 orbits – which is an error-margin of:
214mm over 9 orbits (23 mm per orbit).

Scenario [23] calculates that with General Relativity Venus is:
108940972.276101km at the 10th orbit – which results in:
7.055 kilometres outward drift, or 784 metres per orbit for those 9 orbits.

The consequences of gravity travelling at the velocity of light are surprisingly significant even for a smallish planet like Venus. The consequences of this are dealt with elsewhere. This section is only concerned with describing how the algorithm actually performs theses functions.

OGS12 is an improvement on the previous algorithm OGS11 (***orbit-gravity-sim-11.exe***) as regards gravity travelling at the velocity of light. OGS11 just used a '***temporal calculation***' by first evaluating the time-delay between how long it would take for gravity travelling at the velocity of light to cover the distance between the two objects. The position of both body's orbits are also recorded at every step that the algorithm takes.

Then using the time-delay the software calculates backwards in time as to find the *gravity-origin*: where the opposing body *was* when the gravity left that body. However, the computer 'iterates' in quantum jumps, and if it calculates 10 jumps back in time, the error-margin may be as high as 10%, but if it is only 3 jumps back in time that the algorithm is referencing, then the error-margin may be as much as 33%.

OGS12 improves on this by using a '***spatial calculation***' to find the *gravity-origin* by simply drawing a straight line from its current position and then reversing its current velocity to find that previous position. The time-delay between two bodies will result in an approximate previous position based on a straight-line rather than a curve like the 'temporal calculation' uses.

In addition, OGS12 uses an *auto-switch* so that if the error% in the '***temporal calculation***' is worse than 2% it switches over to the '***spatial calculation***'. That '2%' is a variable that the user can adjust, but mostly the '***spatial calculation***' is best. The *spatial calculation* only becomes proportionally inaccurate when the orbit is highly elliptical and the direction change is very large between jumps. In this situation the curve of the orbit is significant. Of course it would also be possible to combine both processes into a more precise adjustment. But that would be splitting hairs.

The change that *Special Relativity* would have on the orbit of Venus would be very small, because Venus has an orbit that is more than 98% circular. The result is an *inward* drift of about 40m per orbit, so that in no way cancels out the outward drift of 780m per orbit from General Relativity like so many people *believe* it should.

As has been shown in the other sections, the Jupiter-Sun binary drift apart at 760km per orbit at their nearest – and they drift apart at 860km per orbit when furthest – when Einstein's theories are applied to their orbits. The Earth-Moon binary would drift apart at about 400m per orbit under Relativity. The Alpha Centauri binary is most extreme: They would drift apart at over 1.4 million kilometres per orbit under General Relativity. The mass and velocity of the Alpha Centauri pair are similar to one another: hence the radical outwards drift.

I have not noticed anyone else make such computations before. And the real tragedy is that as I am writing this, the Nobel Prize has just been awarded to Weiss and the LIGO group for 'proving' that Einstein was correct in theorizing that gravity travels at the velocity of light. But the reader needs to examine the chapter prior to this to see why the LIGO thesis is riddled with numerous logical errors, blatant contradictions, as well as historical inaccuracy.

I have to sadly conclude that most contemporary astrophysics is little more than sophistry and pseudo-science, if not blatant corruption. However, LIGO may just be a grand test.

10

N-BODY RELATIVITY:

Does Special Relativity *really* yield the same results in all reference frames?

The algorithm ***orbit-gravity-sim-12.exe*** must first determine the exact velocity of a star or planet, in order to impose the principle from Special Relativity, which decreases the Newtonian acceleration so that nothing can move at or beyond the velocity of light.

Special Relativity velocity adjustment:

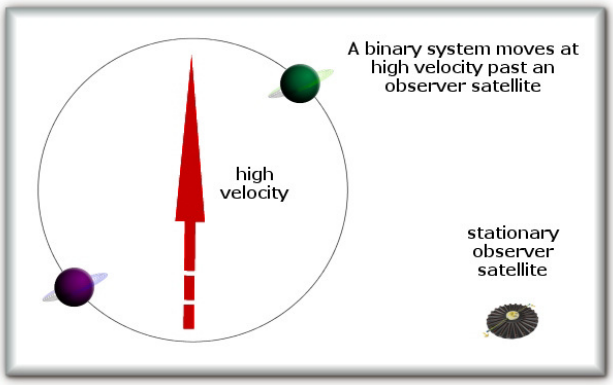
$$V = \frac{U + u}{1 + U*u}$$

All velocities must be measured as a proportion of the velocity of light, so that light-speed is v=1. The starting velocity 'U' is added with 'u' and the result is 'V' which is always less than 1.

But any velocity can only be measured by comparing it with a starting reference point of zero velocity. Now in Newtonian terms, the shape of an orbit seems to be the same regardless of where we take that starting point. Newton's laws are thus said to produce identical results in all reference frames. But in Einstein's Relativity where we take the starting reference point to be, will change matters fundamentally; most specifically in systems of numerous bodies.

The simplest way to realize this is to envision a binary system of stars moving past an observer such that the binary system is at a high velocity compared to the observer. However, in comparison to one another, the two bodies in the binary pair are orbiting one another quite slowly.

Under Newtonian laws, the *shape* of the orbits in that binary system apparently changes zero in comparison with one another or in comparison to the observer regardless of where we take the starting reference point to be.



But in Relativity, if those velocities are taken from the point of view of the midpoint (barycenter) of the binary pair they would then not have much velocity reduction – they would not spiral inwards by much. They have low velocity compared to one another so they are changed little by the formula: 'Special Relativity velocity adjustment' (depicted earlier).

However, from the perspective of the observer they are moving past at high velocity, their velocities would both be high and thus reduced more radically away from the Newtonian amount by Einstein's formula. They would spiral inwards *more* if we observe them from the satellite they are moving past at a rapid rate, than if we observe them from the midpoint between the pair. Relativity gives us contradictory shapes to the orbits depending on their

comparative velocity to the observer. This is quite contrary to the claim that Relativity is the same in all reference frames. *It certainly cannot be, even though it insists it is!*

Now those who have not attempted to construct an algorithm with 3-bodies depicting Special Relativity may decide to disagree here. You may choose to believe that the larger velocity reduction from the perspective of the observer satellite is the same in Relative terms to the smaller reduction when comparing the pair to one another. You will also need to carefully consider the discussion on the various methods used to calculate this reduction in two dimensions in the previous chapter. So if you feel utterly certain that Special Relativity will yield the same results in all reference frames then you should be able to construct a 3-body solution to Special Relativity in an algorithm. Of course you can just *assume* that it *must* all add up. But before you do that, first consider the following example.

Next we evaluate the formula for time-dilation according to Special Relativity:

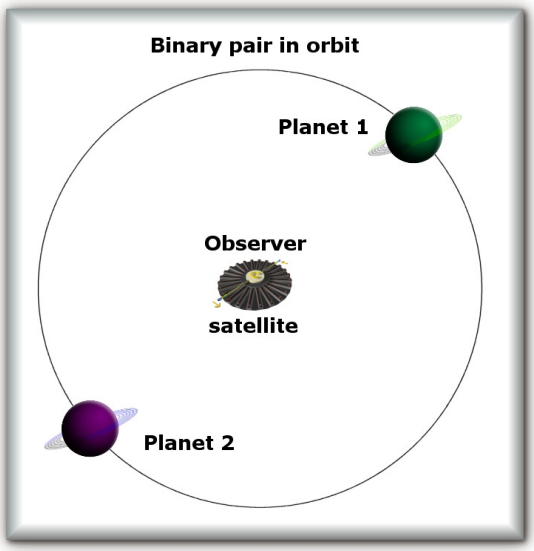
Special Relativity time adjustment

$$T = \frac{t}{\sqrt{1-v^2}}$$

All velocities must be measured as a propoportion of the velocity of light, so that light-speed is v=1.

(Formula simplified from Ohanian, p. 439) Because we divide by a number less than **1** the new time '**T**' is going to be a higher number than the Newtonian time: '**t**'. But because the faster object records less time, the new time '**T**', can only be the time of the external observer. (Feynman, p. 78. Twin's Paradox).

Let us apply this formula such that, we consider a starting reference point of zero velocity to be a satellite at the midpoint between a binary pair of stars (or planets) in a circular orbit. This pair then orbits one another at equal but opposite velocities according to Newton:



So in Special Relativity time is said to slow down when an object approaches the velocity of light. Using the formula previously, more time passes externally to the object that has greater velocity.

We are now going to get three different time situations depending on which starting reference point we use. If we take the satellite at the center of the pair as the zero-velocity

reference – then time at the each of the binary pair would run slower than at the satellite – but time for the binary pair are equal to each other – in this instance.

And yet, if we take either one of the stars as having zero velocity, then time at the other star has time running slowest because that star is moving fastest. So if we allow three clocks to exist in the three positions for a while, and then bring them together, which clock will ***empirically*** record the most advanced time?[Φ]

Well, it makes intuitive sense to take the barycenter as the zero-velocity reference point so that we can observe the shape of the binary orbit most clearly – so in the computer algorithm, the barycenter is always taken as the reference point. If we do this, then we reach the conclusion that both the stars have the same measurement of time according to Special Relativity. But if we consider any one star as the zero starting reference, then the other has velocity and vice versa. Thus they have velocity differences relative to one another, so they should therefore be suffering from contradictory time-dilation relative to one another!

So Relativity gives us contrary consequences depending on the reference frame. And it does this because it tries to apply its formulae identically across any reference frame.

It may also be theorized, that in a circular orbit, the distance between a pair is always constant so they would then have zero time dilation difference because they have a relative velocity of zero. But if they have zero velocity between them then gravity should pull them together. Of course that is wrong because the gravity is what is keeping them at an equal distance apart due to their mutual binary orbital movements. But that mutual orbit is only a meaningful concept relative to the midpoint as the starting reference. They require an objectively real orbital velocity when compared to one another to overcome gravity.

Thus we have to conclude that their velocity *relative* to one another is meaningless as a starting reference. Only the midpoint as a starting reference will enable the pair to maintain a binary orbit. If we start with any one of the bodies having zero velocity then it will immediately acquire non-zero velocity caused by gravity from the other body. And this is just as true in Relativity as it is in the Newtonian paradigm.

So it is essential to realize, that even a binary orbit is not actually a two-body system, because the barycenter is a third essential positional point. All binary orbits can only be properly calculated as a three-body system even if the third 'body' has no mass or gravity of its own. The midpoint (barycenter) is an essential objective positional aspect of any binary system.

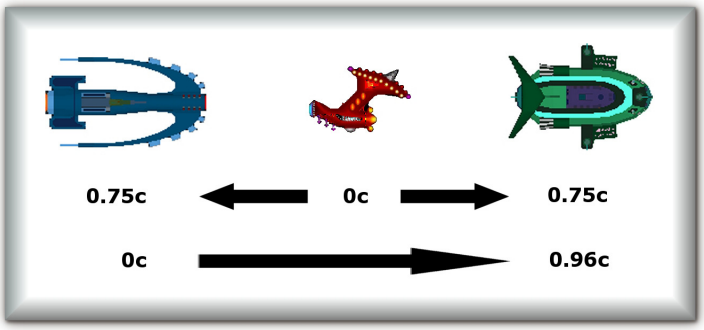
The orbit of the binary pair is only meaningful when observed to be moving compared to the objective notion of 'fixed' stars. The barycenter and the 'fixed' stars thus represent the same reference frame; without which any lack of movement between the pair will result in gravity starting to move the pair together – because they would then have no binary orbital structure.

We have already seen how it is impossible to *objectively* measure time-dilation from Special Relativity. Now the Relativists claim that this does not disprove Special Relativity, but instead they claim that it proves that '*simultaneity breaks down*'. They are thus claiming that the laws of physics give different results depending on the reference frame – at the same time they also claim that *the laws of physics are the same in all reference frames*.

Now in the previous section, logic forced us to accept that orbits must be absolute in the same sense that axial-spin is absolute. But we also realized that linear movement is not the same as orbital movement, so none of those arguments in the previous section seem to apply to objects moving in a straight line due to their own propulsion (nor these mentioned here so far).

[Φ] The pedant may wish to point out that moving the clocks will change the rate of time dilation. So we either move them extremely slowly such that this effect is negligible, or we record the amount on the clock and then transmit a hard-coded signal in all directions to any observer.

Thus it must also be demonstrated that when we apply the adjustments for Special Relativity to three objects in the context of linear propulsion, we cause just as many contradictions as we do when applying Relativity to orbital velocity. Consider these 3 spaceships:



First we take the red spaceship as the point of reference (zero-velocity) and consider a blue spaceship moving to the left, and a green spaceship moving to the right. If both the outer ships move at 0.75 the velocity of light away from the centre, then in Newtonian terms the blue and the green are moving away from each other at 1.5 times the velocity of light. However, this is unacceptable to the Relativists, so they consider that if blue is the zero-velocity reference point, then the green spaceship is moving away from blue at 0.96 times the velocity of light using the formula 'Special Relativity velocity adjustment' at the start of this section.

But if we have three observers situated along the path of this event, each of the outer two observers being a measured unmoving identical distance of 0.75C from the middle observer, then what times are they going to record that the distance has been covered in? We know that they must record that the blue and green ships are 1.5 light-years apart after 1 year. So the Relativistic calculation that they are 0.96 light-years apart simply has to be bad math. (Though of course, the Relativists are bound to simply disagree).

11

NUMERICAL RELATIVITY – A POST MORTEM:

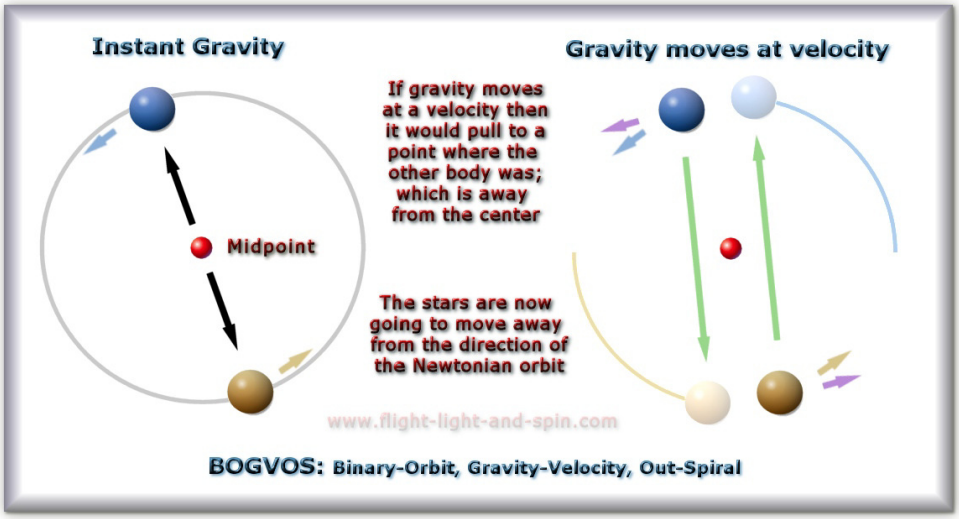
Gravity having velocity prodigiously changes the orbits of binary systems

Numerical Relativity is a widely published computational paradigm with similar goals to the algorithm used in this chapter: ***orbit-gravity-sim-12.exe*** (OGS12). That purpose being to observe and predict the potential effects of Relativity on orbits, most especially binary orbits. The article titled 'Black-hole binaries, gravitational waves, and numerical relativity'[♠] by Joan Centrella and John G. Baker will be the main reference in this section for why I am claiming that:

The paradigm of Numerical Relativity is intrinsically illogical for the simple reason that the geometric role of gravity moving at the velocity of light has been over-looked when applied to the geometry of all binary orbits – not just super-massive bodies like black-holes.

Simply put, my claim is that if a binary pair has gravity moving at the velocity of light, then they will both not be attracted to an opposite point perpendicular to their movements, but instead they will attract to a previous point on the orbit-path. This can only cause an outwards-spiral to the orbital binary because attraction is to an angle behind the mid-point of the system, and not through the mid-point.

[♠] arXiv1010.5260 (http://arxiv.org/abs/1010.5260v2)



Even though it is quite apparent that Centrella (et al) have not even vaguely considered the geometric effect on a binary system with gravity moving at velocity, let us look at the premise that they begin with:

1010.5260.pdf Centrella p.3

For a Schwarzschild black hole of mass M, the *innermost stable circular orbit* (ISCO) occurs at $r = 6M$ ...

... Imagine that you put the two black holes on an *instantaneously* circular orbit around each other; at that moment they have neither nonzero radial velocity nor nonzero radial acceleration.

... Black holes at closer separations would be expected to fall inward, toward the center, even without radiating angular momentum via gravitational radiation.

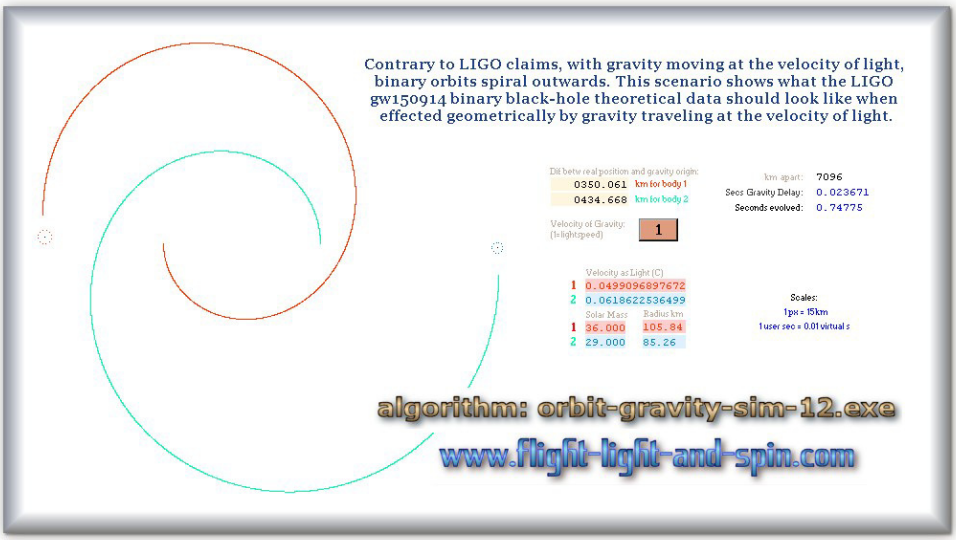
So we clearly have two given reasons for the alleged inward movement of the binary black-holes towards the centre: Firstly, the Numerical Relativist concept of '*gravitational radiation*' – which is said to result in a loss in mass and velocity – and secondly the '*fall inward, toward the center*' which is the inwards spiral from General Relativity which Hawking measures in electrical heaters:

Hawking p.94

ate. The rate of energy loss in the case of the earth and the sun is very low—about enough to run a small electric heater. This means it will take about a thousand million million million million years for the earth to run into the sun, s

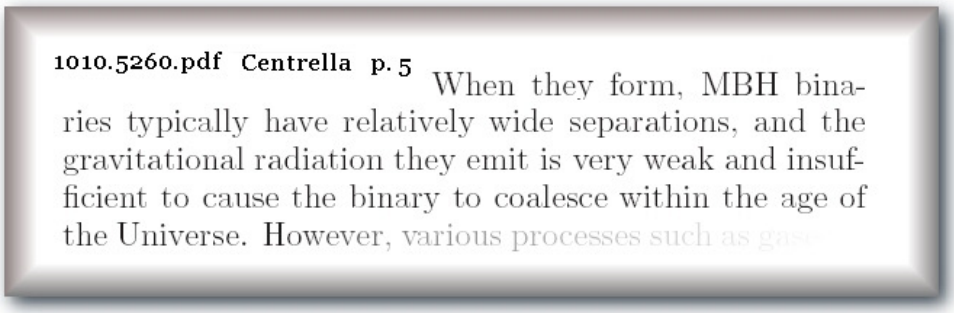
At no point does any author even consider that a delay in gravity must have a geometrical effect on the shape of a binary orbit. Scenario [13] of the ***orbit-gravity-sim-11.exe*** algorithm (OGS12) shows that a radical outwards spiral *must* result from gravity travelling at the velocity of light for a binary system. This scenario is at the scale that the Numerical

Relativists suggest. The outwards-spiral is a purely logical consequence, and is a far larger effect than any other aspect of theoretical physics mentioned in the Centrella article or any other historical reference:



Notice the orbit-path trailing behind the body in this image. This represents the difference between the position of the body itself and the position of the gravity-origin for the opposing body. This difference is caused by the delay in gravity due to it supposedly travelling at the velocity of light.

The full geometrical details are dealt with at length in the preceding chapter, using the previous algorithm ***orbit-gravity-sim-11.exe*** – so I will here only be assessing the logical omissions made by the Centrella articles when considering Massive-Black-Holes – or as they call them: MBH:


1010.5260.pdf Centrella p. 5

When they form, MBH binaries typically have relatively wide separations, and the gravitational radiation they emit is very weak and insufficient to cause the binary to coalesce within the age of the Universe. However, various processes such as gas

As has been demonstrated previously in detail, even a quite slow moving, radically less massive binary – as far apart as 5 000 million kilometres, such as Alpha Centauri, will separate at over 1.4 million kilometres every orbit when we take into account the hypothesis that gravity *could* travel at the velocity of light. So the binary pairs could never actually form, or sustain a binary orbit for more than a few thousand years – if gravity travels at the velocity of light.

There is just no evidence whatsoever that anyone besides me has simply added the geometrical consequence of gravity travelling at the velocity of light to the shape of a binary orbit. So if there is a way to compensate for the geometry of BOGVOS (Binary-Orbit, Gravity-Velocity, Out-Spiral), it would have to be an entirely new principle – and not part of anything from Einstein, the Numerical Relativists or any other known Post-Newtonian theory encountered thus far.

But it becomes increasingly important to consider how it is proposed that binary systems could even form amidst such a dynamic. If no significant sized binary pair could sustain itself for even 1 million years with gravity travelling at the velocity of light, then what dynamics could cause such a pair to exist in the first place?

Here is more detail from the Numerical Relativists in this regard:

1010.5260.pdf Centrella p. 5

When they form, MBH binaries typically have relatively wide separations, and the gravitational radiation they emit is very weak and insufficient to cause the binary to coalesce within the age of the Universe. However, various processes such as gaseous dissipation and N-body interactions with stars can remove orbital energy from the binary and cause the black holes to spiral together (Armitage and Natarajan, 2002; Gould and Rix, 2000); see also Berentzen *et al.* (2009) and Colpi *et al.* (2009) and references therein. Eventually, the black holes reach separations at which gravitational radiation reaction becomes the dominant energy-loss mechanism, leading to the final coalescence of the black holes and the emission of strong gravitational waves (Sesana *et al.*, 2009b).

The idea of 'gaseous dissipation' is an exchange of mass between binary pairs. Of course this is a ludicrous contradiction for two different reasons. Firstly, black-holes simply cannot emit gas, because *nothing is said to escape the black-hole*!

Secondly a binary pair of non-black-holes need to be very close to exchange gasses. Clearly any emitted gasses will either fall back to the body or generate a ring system if the two objects are far apart. So such 'gaseous dissipation' cannot remove orbital energy at large distances.

So for 'gaseous dissipation' to occur, the two objects need to be far closer than is possible because of BOGVOS (Binary-Orbit, Gravity-Velocity, Out-Spiral). BOGVOS prevents orbital binaries from existing at any distance – if gravity travels at velocity.

N-body interactions of stars causing binary systems to form is an incorrect assumption that comes about from speculating what N-body systems will achieve – without ever examining how they actually evolve in an algorithm. (See algorithms OG6 & OG8). Even when instant-gravity is used, (and thus orbital binaries can at least be sustained), then in the extremely small chance that a third body can influence a pair to form a binary – the interaction of a fourth body almost always results in the binary pair falling apart – or colliding with each other. (See free online evolutionary algorithms: OG6 & OG7).

The net result is that 50% of third-body-interactions would need to result in two stars forming a binary in order for half the stars observed in the Universe to be binary-systems.

My observed estimate of numerous N-body interactions in algorithms is that third-body-interactions cause two stars to form a binary at odds *extremely far less* than one in a thousand interactions. But of course, if gravity travelled at the velocity of light – then binary equal-mass systems would always decay from a distance of the orbit of Mercury to a distance beyond the orbit of Pluto in one third of a million years (if their masses are about equal to the Sun or the Alpha Centauri binary system).

I cannot say it any more clearly than this: There is zero evidence that any other Post-

Newtonian theorist ever considered the role that the velocity of gravity plays in the geometry of an orbit: it causes a prodigious outwards spiral enormously greater than any other effect of any other Post-Newtonian theory on most orbits by a factor of roughly about a million times.

Moreover let us examine the next blatant contradiction:

1010.5260.pdf Centrella p.3 Each black hole is surrounded by an event horizon, at which the escape velocity is the speed of light. The event horizon is a global property of the spacetime, since it is defined by the paths of "outgoing" photons that are the boundary between photon trajectories that must fall inward, and those that can escape to infinity. The photons defining the event horizon hover at finite radius at the surface of the black hole.

1010.5260.pdf Centrella p.3

Gravitational waves are ripples in the curvature of spacetime itself. They carry energy and momentum and travel at the speed of light, bearing the message of disturbances in the gravitational field.

So how is the 'black-hole' supposed to emit gravity travelling at the 'speed' of light when the escape velocity is that very speed? After all, according to the Relativists, gravity is 'curved space' and thus anything moving through that space will be attracted regardless of whether it has mass or not. So any 'gravitational-wave' could not evade (or even depart from) a black-hole because that black-hole has an escape velocity which is greater than the velocity of the 'gravitational-wave'. Their misunderstanding is positively vulgar in its sheer unthinking negligence.

And what are to make of photons 'hovering'? (top quote). That is quite a curious phenomenon in a theory which takes Relativity as a premise. The constancy of the speed of light implies that the photon cannot slow down, let alone hover!

It feels a bit like squashing a dead fly with a steam-roller to point out this:

1010.5260.pdf Centrella p.19

The tracks show the effects of eccentricity in the early stages of each run; plots of the separation r versus time show that the initial eccentricity decreases as the initial separation increases. As the holes spiral together into the strong-field regime, the eccentricity diminishes.

Well, that last one is an ironic blooper, rather then a genuine conceptual error. Of course they meant to say the 'separation *decreases'* (as the holes spiral together). But the irony of that blooper is irresistible, especially since I have categorically proved, computed, and demonstrated that if gravity moves at the velocity of light then the separation would actually ***increase***!

12

INTERNAL TIME OF THE PHOTON:

Does time stop at the velocity of light?

In Chapter XXVII (Relativity Revised) I suggested that if time slows down due to excessive velocity from Special Relativity, then this is mathematically the same as velocity slowing down. So consider an object that moves a distance=10 after time=1. Then consider that when it becomes *relativised* it would be at distance=10 after time=2. I concluded that this is the *same* as the velocity halving and the rate of time staying the same.

Numerous characters using non-de-plums on various internet forums claimed that I had misunderstood Relativity, and that it is only the time *internal* to the moving object that experiences time-dilation. The consequence, they claimed, is that *internal time* will stop for any object travelling at the velocity of light – like for example: the internal time of a photon.

But if the internal time of the photon is unchanging, then there would be no properties of the photon which move. Everything internal to the photon should be frozen in time.

But photons are said to have spin, wavelength and frequency, all of which are dependent on time moving from the internal perspective of the photon. So time cannot be frozen internally to the photon, if it did then internal features of the photon such as photon-spin, wavelength and frequency would have to be observed as unmoving.

This is clear as starlight. But even so, the velocity of the photon is still able to be considered from the inside-perspective of the photon. So the internal parts of the photon would never have moved if time for them had halted? The surface of the photon has never moved from the internal-perspective of the photon? None of the photon moves – from an internal-perspective!? It is not that simultaneity breaks down – it is that Special Relativity is broken – it has never worked – it is in fact almost entirely illogical.

13

SCIENCE OF THE GAPS:

Academic Science is guilty of similar gross assumptions that medieval religion and philosophy was.

A common knee-jerk reaction to the planetary-geometry that evolves in these algorithms made by the typical *anonymous* internet troll is that: 'Other aspects of Relativity compensate' for the drift that these algorithms compute. It is simply assumed that Relativity is correct, and that the 'gaps' demonstrated in this assessment are filled in by 'Science'. It is deeply ironic how most of the scientific community mimics the naïve part of the Religious community in its assumptions.

God of the gaps. The hostile phrase applied to theories appealing to the concept of God to explain anything science currently finds inexplicable, for instance, the origins of life or of consciousness. Theologians now generally regard such appeals as creating only the illusion of explanation, and providing no valid basis or support for *theism. **Flew, p.133** - Dictionary of Philosophy

If gravity moves at the velocity of light then Jupiter would move away from the Sun at hundreds of kilometres per orbit. The Alpha Centauri binary would move away from each other at over a million kilometres per orbit – if gravity moved at the velocity of light. There simply is no other part of Relativity that can compensate for this massive fluctuation. The

computational cause of these drifts away from the Newtonian orbit is simply a geometric consequence of gravity (hypothetically) moving at the velocity of light.

Under the same concept, the Moon would move away from the Earth at more than 5km per year. All the other facets of Relativity are measured as being in the vicinity of 1mm per lunar orbit – or less. The difference here is a factor of nearly half a million times. The outwards movement of the orbit caused by gravity having velocity (General Relativity) is actually half a million times greater than any other aspect of Relativity in the context of the lunar orbit.

The gravity of other planets (and the Sun), being beyond the orbit of the Moon can only add to the *outwards* drift of the Moon away from the Earth. So those who try and apply assumptions of n-body gravity to the orbit of the Moon without constructing an evolutionary algorithm are similarly guilty of 'Science of the Gaps'.

Simply being able to place numbers in a formula is certainly the 'illusion of explanation'. Now what about the pervasive claims that GPS uses Relativity? Simply: It does not. That is just a popular internet rumour endlessly regurgitated by the scholastic mob. It was certainly demonstrated to be without any logical foundation in Chapter XXVIII which also contains several references to companies that use GPS systems, all of which refute the use of Relativity in their operations. That chapter also demonstrates numerous other mathematical reasons as to why GPS could not use Relativity.

14

AXIOMATIC EUCLID:

Errors of the last Century have been compounded.

The ground work of Newton and Galileo in developing the scientific method of Descartes changed the world. Their philosophical foundation was Euclidean geometry which originated in ancient Greece. Before Einstein it was considered that Euclidean geometry was infallible and thus axiomatic.

In the light of this computer algorithm: ***orbit-gravity-sim-12.exe*** (OGS12), and the subsequent analysis of those results that categorically prove that Relativity is a failed paradigm for numerous reasons – it can only be concluded that the majority of persons in academia have assumed that the discoveries of other persons from previous centuries have granted *them* with a position of *intellectual entitlement*.

The *institution* of Science is not the *method* of science. These two entities are certainly moving further away from one another at ever greater amounts! But at least Descartes, Newton, Euclid and Pythagoras have been shown to be far better *philosophers and geometers* than almost all the prominent 'Scientists' of the 20th century. The very word 'science' is becoming synonymous with sophistry; instead the honest philosopher and astute geometer should reclaim the phrase 'logical positivism'. This is a method, and hopefully well never be an institution of blind dogma that science has degenerated into.

It has been widely claimed that Gravitational lensing was predicted by Relativity – but not really. Laplace (Ohanian, p. 440, Section E4) predicted this 100 years before Einstein. Newton deeply considered the possibility that gravity was not instant. So Einstein had only one of two options to choose on the issues of both Gravitational lensing and a velocity for gravity – he was not the original theorist on either account.

So are we to discard all of Relativity? – Perhaps not. The limit on velocity of light *could* still be non-relativistic and thus absolute. I have shown that the concept of Einstein's Relativity causes contradictions in the way that two observers will see two different inward spirals if they observe an orbit from different external vantage points with different velocities.

A formula which enforces a limit at the velocity of light is clearly incorrect when taken from *any* reference point. There is an outside chance that this formula *might* still work if an objective reference point can be found. So *that* formula still requires a radical revision – if it is indeed even at best – grossly inaccurate.

If we decide that the Earth cannot be moving inwards towards the Sun at 100m per year – or we do not like the idea of Mercury being a Moon of Venus just 30 million years ago – then we have not concluded that there is no limit at the velocity of light. But we must then abandon Feynman's interpretation of that limit. We can still apply the limit at the velocity of light in a similar way to how Miles Mathis suggests – the Special Relativity formula would then be reversible – so that when the object *decelerates*, it regains all its lost velocity. Then we have to view with extreme scepticism any claim that Special Relativity has been verified through esoteric experiments – and we do this on the basis of pure logic.

I am not much of an empiricist myself. I am a logician performing a purely analytical role. I can only say which observational claims are logically consistent with other claims; and also which theories are logically consistent with their own premises. So if the Feynman interpretation of Special Relativity's velocity limit is correct, then Scenario [15] demonstrates that a satellite with a highly eccentric orbit will spiral inwards towards the Sun – at a rate of more than 50km per orbit at its furthest extremity.

This hypothetical satellite (named 'Daedalus') would begin five million km from the Sun with a velocity of 100km per second. It would then move within half a million km of the Sun's 'surface' to be able to be altered by Relativity in this way (unless it simply melted like wax – but I deliberately did not call it 'Icarus').

The famous Michelson-Morley experiment is a prime case that has never been properly examined in terms of authentic computational analysis. This famous experiment does not actually prove that Aether does not exist. It only proves that light is not moving at its velocity in relation to an external fixed medium; a medium which is supposedly itself independent of the movement of the Earth. In that sense the Michelson-Morley experiment does prove that the velocity of a photon is independent of an unmoving Aether, yes…

However, now that it is clear that gravity has nothing to do with any of the concepts in General Relativity – that gravity is ***instant*** and NOT curved space (see Chapters XXVIII, XXIX & XXX) – then the only recourse is to belatedly resurrect the concept of an instant gravity field. Now because the gravity-field of the Earth has to be moving with the Earth – it is a distinct possibility that the photon in the Michelson-Morley experiment moves through the gravity-field as *its* medium.

If the velocity of the photon is always moving at the velocity of light when measured on Earth – then the only conclusion is that whatever medium this photon is moving through is *itself* moving with the Earth. The Earth's Gravity-field being one such candidate, the Earth's magnetic field being another; and an entirely new concept: 'Etha' being a consequence of tests failing the previous two candidates (see Chapter XXVII for more details on this theoretical concept).

The notion of the velocity of light being constant in all reference frames – regardless of the movement of the reference frames themselves – is just painfully awful geometry. It makes a mockery of the very concept of logic. I realize that the die-hard Relativists cannot tolerate giving up their idols, regardless of how illogical those concepts are.

But what more can be said of those who insist that the emperor has very beautiful clothes, when he is dressed only in underwear that is full of holes? Big *black* holes that give off gravity that moves at the velocity of light, when these black-holes supposedly cannot give off anything that moves at the velocity of light!

Euclidean geometry is certainly axiomatic. It is *almost the* intrinsic self-evident aspect of all logic. The only idea more resilient than this is the *Laputan* nature of contemporary academia. If measurements of the interior angles of a triangle add up to greater than 180

degrees, then this is certainly reason to propose that our notion of space requires another dimension. But once we include a fourth dimension of *space*, then the Euclidean principle is preserved. (Again, see previous chapter XXVII for more on this.)

15

GRAVITY PROVED INSTANTANEOUS

Is proof a concept of logic or of media monopolization?

Because Sum Theory is in disagreement with the popular paradigm of Relativity, certain aspects of General Relativity need to be examined. When investigating how all the various principles and interpretations of Einstein's Relativity could effect the solar system and planetary orbits, we first need to dismiss as negligible, the small inwards spiral from General Relativity which for the orbit of the Earth is said by Hawking in A Brief History of Time to be:

> For example, the movement of the earth in its orbit round the sun produces gravitational waves. The effect of the energy loss will be to change the orbit of the
>
> Hawking, p. 94-95
>
> earth so that gradually it gets nearer and nearer to the sun, eventually collides with it, and settles down to a stationary state. The rate of energy loss in the case of the earth and the sun is very low—about enough to run a small electric heater. This means it will take about a thousand million million million million years for the earth to run into the sun, so

This amounts to an inwards spiral rate of 1mm for 500 times the age of the Universe. It must be noted that the '*Numerical Relativists*' and the LIGO group *could* have interpreted this in a way which is quite different to Hawking; far more rapid, but which remains rather opaque from a purely formulaic perspective in their articles[§].

In the GW150914 experiment they conclude that such an inward spiral when applied to a pair of black-holes in very close proximity spirals inwards at over 3000km per second. (Vitally this is not the orbital velocity of the pair of bodies, but the rate of them moving towards one another in a 'radial' direction). I can find no reference to how they get that result from *historical* non-internet sources of General Relativity.

And thus I can only conclude as a matter of form, that LIGO are not using Einstein's Relativity to attain such an in-spiral. Instead, it seems, their process should be considered as 'Numerical Relativity' – another theory entirely; albeit based somewhat on Einstein. A simple energy conservation calculation will serve to show that the two theoretical claims of inward spiraling orbits are not the same:

If the combined solar masses of the black-hole binary are 20 million times greater than the Earth, then this would equate to 20 million electric heaters (Hawking's unit of measurement). This is the energy output of a city, which is certainly not enough to move 66 solar masses 350 kilometers in 0.1 seconds – as the LIGO experiment suggests. Thus the proof that the in-spiral of the Numerical Relativists is quite different from Hawking's historical narrative is just a *sum*. And it is a sum that checks the two as being different by a factor with more logarithmic zeros than is even worth counting.

[§] PhysRevLett.116.061102 (PhysRevLett.116.061102.pdf)
arXiv:1010.5260 (http://arxiv.org/abs/1010.5260v2)

However, it is widely quoted that Numerical Relativity is in keeping with General Relativity on most websites. A vital way to see that there is a *categorical difference* between the two theories is that According to Hawking, it is a loss in *velocity* that is the source-energy for gravity, whereas for the Numerical Relativists, the object somehow loses *mass* in order to provide the source energy for gravitational-waves. But the Numerical Relativists make another glaring historical omission because *at no point is Special Relativity even mentioned in their analysis*. And for Einstein, Special Relativity is a priori to General Relativity.

The obvious problem being that in Special Relativity, an increase in velocity causes an increase in mass – whereas the Numerical Relativists have a decrease in mass with an increase in velocity. It seems entirely contradictory for Einstein to suggest that Special Relativity yields an increase in mass with increased velocity whilst General Relativity would have a decrease in mass with increased velocity. If he did claim this, then that would show that his two theories contradict one another on their own terms.

That is why I take Hawking's quote of a decrease in velocity as the source of energy for gravitational-waves, as being historically correct. Most websites seem to have copy-pasted the Numerical Relativists error (or re-conception) of the source of gravitational energy being a loss in mass. This topic is discussed at length in the previous ***Chapter XXIX: Analysis of GW150914***.

Because my analysis is at odds with most other internet sources, I am of course expecting it to be contested and unduly vilified. This is the way pop-physics operates: it is little more than crudely democratic herd-instinct. Logical issues are seen as less important than popularity.

So it is important to realize how I am claiming, besides everything else, that General Relativity should have a purely geometric effect on orbits that *nobody else has noticed or even considered*. This is a ***purely logical consequence of gravity moving at the velocity of light***. Be careful here, because to counter this, the sophists will typically try and refocus the topic of discussion into an area that has nothing to do with the geometrical consequence of gravity having velocity. Stick to the issue!

Let us look more closely at how Hawking explains gravitational-waves:

out. In the quantum mechanical way of looking at the gravitational field, the force between two matter particles is pictured as being carried by a particle of spin 2 called the graviton.

Hawking p. 74-75

effect—they make the earth orbit the sun! Real gravitons make up what classical physicists would call gravitational waves, which are very weak—and so difficult to detect that they have never yet been observed.

So it is quite clear that regardless of whether we are looking at Quantum Mechanics or Relativity, gravity is still a force measured in *Newtons* – and it is still holding you down on the Earth. Of course, since then the LIGO group *have* claimed to have detected gravitational-waves and determined the speed of gravity.

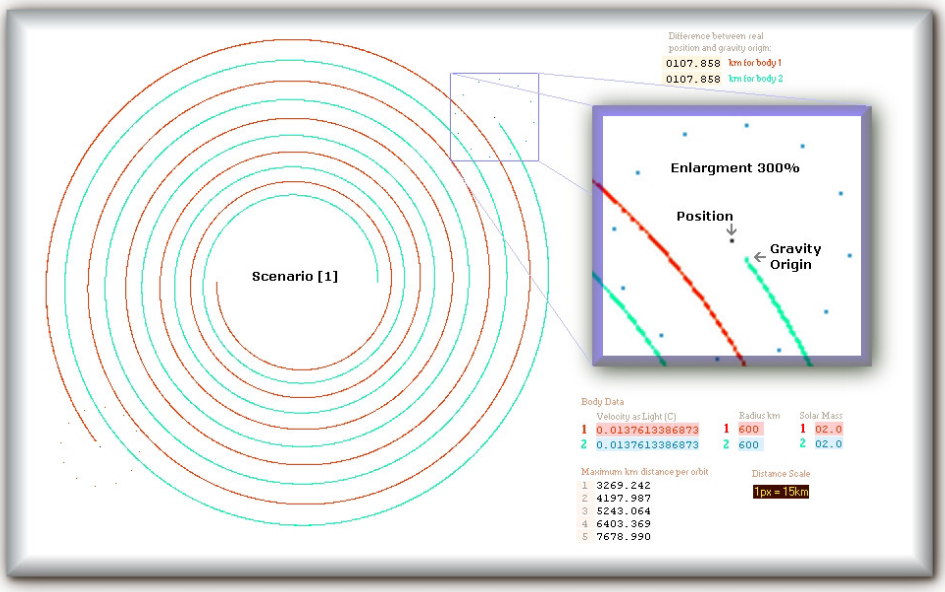
Hawking, p. 94

> General relativity predicts that heavy objects that are moving will cause the emission of gravitational waves, ripples in the curvature of space that travel at the speed of light. Thes

So regardless of descriptions such as 'space-time', General Relativity is still certainly claiming (in the above quotes) that gravity is a *force* traveling at the 'speed of light'. And, it is abundantly clear that Relativity is thus also inadvertently claiming that there will be a delay in the gravity – because gravity is said to travel at the ***'speed of light'***! It is truly astonishing at how many people have mindlessly rehearsed the incorrect notion that General Relativity is not claiming that gravity is traveling at the velocity of light. Nobody ever seems to consider how the *speed-of-rumor* is much faster than the speed of reading an actual book!

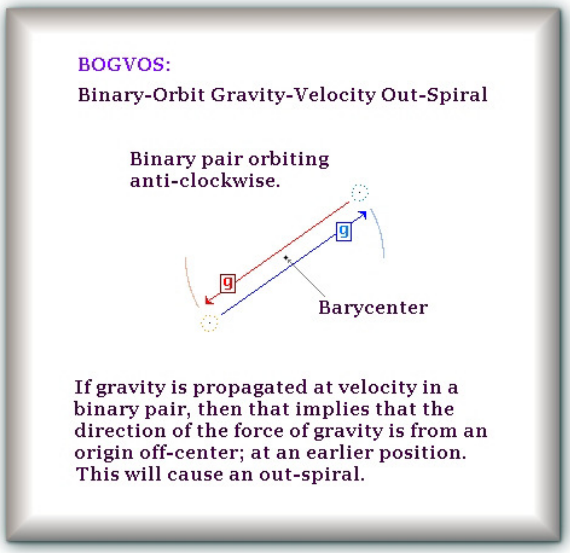
Now this delay of gravity occurs in both directions between any pair of celestial bodies. It is an effect which the Sun has on the Earth and also the lesser gravity which the Earth has on the Sun. This delay has an increased effect when *both objects* travel at higher velocities and at larger distances apart.

Scenario [1] in the algorithm ***orbit-gravity-sim-12.exe*** (OGS12) is a hypothetical pair of dense white-dwarf stars orbiting anti-clockwise in close proximity. This shows the effect of ***gravity-velocity*** at it most visibly pronounced scale:



It is astonishingly clear that if gravity is delayed, then it will pull in the direction, that the opposing body *was*, and not in the direction that the opposing body actually *is*. That is why there is a clearly marked difference between the ***position*** and the ***gravity-origin*** in the graphic above.

This difference is demonstrated in the OGS12 algorithm (***orbit-gravity-sim-12.exe***) which generated the image above. The orbit-line is thus depicted as visibly trailing behind the center of the star by 107.858km in this snapshot example because: gravity is delayed. The result of this delay on the geometry of an orbit is a concept that has been termed ***BOGVOS***: Binary-Orbit, Gravity-Velocity, Out-Spiral.



Now the example in Scenario [1] is fairly extreme (albeit nowhere near as extreme as the LIGO GW150914 binary). Both white-dwarf stars are very dense; only 600km across, whilst weighing each twice the mass of the Sun – and only a few thousand km apart, and they are thus moving at 1.3% the velocity of light. That is why the effects are clearly observable – this hypothetical pair would spiral outwards enormously.

As we saw earlier, in the context of the orbit of planet Mercury, this same outward spiral from the gravity-velocity of General Relativity becomes much smaller than the inward spiral for Special Relativity. This is because the effect of Mercury's tiny mass on the Sun is very small, and only barely able to be calculated. Mercury shifts the Sun by a tiny amount on each orbit attaining a very small velocity.

Mars is in the same category as Mercury in this regard – a low mass body in an eccentric orbit. Scenario [15] of the OGS12 algorithm depicts a hypothetical satellite near the Sun called 'Daedalus' which is a more extreme example of Special Relativity overpowering General Relativity's effect on orbits.

For all the other examples in this study: Venus, Earth, Jupiter, the Moon and the Alpha Centauri binary – it is the outwards spiral caused by a delay in gravity traveling at the velocity of light that is the dominant Relativistic effect. In these examples all of the other various principles of the Relativities in orbital structures have been computed to have considerably less effect than gravity moving at velocity.

It is important to realize that this effect is simply a logical consequence of gravity traveling at the velocity of light. It is not a theory itself. It is proof against Relativity because it shows that Relativity fails the test of internal logical consistency. It is proof that gravity can only be propagated instantaneously. In all the examples other than Mars and Mercury (consisting of Venus, Earth, The Moon, Jupiter and the Alpha Centauri binary) BOGVOS overpowers every other aspect of Relativity. Often as much as a million times over.

The only way to attempt a rescue of Relativity would be to invoke the 'science of the gaps', either by suggesting that this analysis is incomplete in its assessment of Relativity or by actually fabricating new Relativist principles. The net result would be to claim that all these various Relativistic processes cancel one another out. This reminds me of another idea called: Banana gravity. Here we take Newton's formula, and add a banana. Then after doing this, we subtract a banana and the net result is a wondrous new theory on gravity which can only work for direct descendents of monkeys.

16

METAPHYSICS AND COSMOLOGY:

What is your criterion for credibility? Is it Fame and social status? Or is it logic?

The first [30] Scenarios of the algorithm ***orbit-gravity-sim-12.exe***, (OGS12) examine how orbits are altered from the Newtonian paths by the principles from the various theories and interpretations of Relativity. For the first time, these simulators now also had flexible scales for both time and distance. After constructing this algorithm it became instantly compelling to test other theories in astrophysics: specifically the time it takes for stars to hypothetically form out of gas-clouds; and similar to this, the concept of 'critical density' needed to be put to the test. Both these ideas are related because they are concerned with the time it takes for objects to coalesce because of gravity.

In order to examine how stars may have formed from gas-clouds several premises are assumed as starting foundations. The first such premise is the average density of the Universe: which seems to be widely accepted as: 10^-19kg / km^3 or expressed as:

Density of the Universe: 10^{-19} kg/km^3 (10^{-28} kg/m^3) ? or 2.7×10^{-18} kg/km^3

The age of the Universe is taken to be commonly accepted as being about 13 700 million years – and I can see no clear or obvious reason to contest that. However the estimates of the rate of expansion and the size of the Universe are quite different depending on where you look. The shape of the Universe is also an open question, it seems, so there is far more foundational labour to be undertaken before it can be tested how stars may coalesce at certain densities.

Strangely, many adherents of Einstein's limit at the velocity of light have no problem with a Universe that has been expanding at a rate faster than light. It seems quite an obvious point of pure logic to me that if the Universe were expanding faster than the velocity of light, then the famous microwave radiation from the early Universe would not be able to reach us. If we were moving away from the origin at a speed faster than light, then nothing from that origin would ever be able to get here. After all, the first principle of any reasonable theory should be that it is at least logically consistent with its own principles.

But this process of expansion hinges on the role that the *shape of the Universe* plays in terms of the relationships between: time, radius, density, volume, and mass. The common error is to assume that the Universe is a 3d-sphere. This is similar to the assumption made by ancient people that the Earth is a flat surface. Instead we have to comprehend the tricky notion of a 4d-hypersphere.

It would be wise to realize that original notions of the Earth not being flat would have been very difficult to comprehend at first; even though nowadays such ideas are taken virtually for granted. A further vital realization I have to point out here is that the 4th dimension is *not* time, nor is it space-time, it is just another dimension of space. (Details of this conclusion are in previous chapters).

The shape of the Universe is a fairly recent issue, and for a long time most discussions on the matter had accepted that the Universe being 13.7 billion years old, had to be 13.7 billion light-years in *either* radius *or* diameter, and that it has been expanding no faster than the velocity of light. This would have the neat result that at half its current age, the density of the Universe would be 8 times greater – so long as the amount of matter was the same.

Now there are several ways of describing expansion rate: as an increase in distance (diameter) over time; or as a proportional increase in volume over time; or as the amount of 4-dimensional hyperspace filling up the hyper-balloon of the Universe – over time.

Some would have it that earlier expansion rates were fastest. A new idea is that expansion is fastest recently, even though for quite some time Hubble's observations had been that the expansion was a direct relationship between distance and time (Ohanian p.337 Section D4). ***But if the expansion is consistently the same in terms of diameter over time, then this rate of increase must decrease proportional to volume over time.***

It also needs to be considered that if the amount of 4d hyperspace inflating the Universe could be at a constant rate – equitable to energy – then the earliest change in diameter is greatest. None of the articles I have seen even broaches this subtle difference of description. Whether it is volume or diameter that is constant never seems to be considered – and none of those who claim alternating rates of expansion (that I have seen) seems to venture an actual formula as to how much this rate is changing.

So let us draw the analogy of a balloon inflating. If the amount of new air blown into a balloon flows at the same rate, then the early stages appear to inflate fastest, and the diameter increases less towards the latter stage. Of course this does not mean that actual expansion is slowing down in purely energy terms. But it is slowing down in linear-spatial terms. It will always carry on expanding – just at ever decreasing *proportions*.

The physical irony being that if the amount of air is analogous to the amount of energy required to expand the Universe, then we violate that most sacred of principles of physics: conservation of energy. In order for any expansion of the Universe to take place, new energy must be entering or altering the Universe all the time. But if the amount of new energy is increasing at the same rate, then at least we have something of the *veneer* of energy conservation.♥

But the problem is more nebulous than this because it seems to me that there are numerous basic misunderstandings taking place in most theories. The notion of gravity being *curved space* has been demonstrated as illogical in Chapter XXVIII for numerous quite different reasons. Simply put, if nothing travelling at the velocity of light can escape a black-hole – and if gravity travels at that velocity – then the black-hole can only give off zero gravity. Thus it can be seen how most theory blatantly contradicts its own principles. This is a calamitous error that has eluded every theorist for the last 100 years including a growing list of Nobel Prize winners.

But most discussions on expansion of the Universe take place under the false notion that if gravity can pull all the objects of the Universe together, then the Big Bang can be reversed. The role taken by the simple shape of ***orbital structures*** is something that has been entirely overlooked, because two objects in orbit around each other will never contact one another. Even the notions from General Relativity and Numerical Relativity that offer Post-Newtonian dynamics of inward spirals are almost always less than the rate of the expansion of the Universe.

The notion of a Critical Density beyond which the Universe collapses can quite easily be disproved. If this Critical Density is said to be 2*10^-17kg / km^3 then the Solar System is certainly more dense than this. And yet the rate of inwards spiral from General Relativity for the Earth and Sun is said by Hawking to be:

Hawking p.94

> ate. The rate of energy loss in the case of the earth and the sun is very low—about enough to run a small electric heater. This means it will take about a thousand million million million million years for the earth to run into the sun, s

This amounts to 1mm for every 500 times the age of the Universe. So the concept of a 'Critical Density' has not taken into account that gravity causes orbits to return to their

♥ Even God may need to take a breather!

origins. It only considers gravity that will cause impacts of bodies in *radial* terms – which is perpendicular to any potential orbital movements.

So let us consider the *simplistic example* that the expansion could be uniform – at the velocity of light, such that when it was 1.37 billion years old, the Universe was about 1000 times denser on average than it is now. The most obvious problem is that at this earlier time, the Universe was substantially more dense than the 'Critical Density'. It does not matter what the rate of expansion is because at earlier times, it is going to be substantially denser than the Critical Density. (One way around this problem, would be if mass is entering the Universe with expansion.)

So this is always my strategy: If we apply the rigours required to construct an evolutionary algorithm, we *nearly* always find that we do not need to resort to any new empirical claims – that by assessing all the various claims for logical consistency the result is one working model, and numerous other models that contradict themselves.

I will use the colour blue, to signify that which I take to be logically consistent with common empirical claims, and that in grey which causes contradictions. Of course we might find more than one logically consistent theory, but normally we simply do not.

Our chief tool is metaphysics.[ϕ] We must appreciate that there are categorically different ways as to how we acquire information. We can observe phenomena ourselves empirically; we can assess observations logically (math & computation), or we can acquire claims hermeneutically. This last method is the most devious, because it often disguises itself as one of the other two methods.

Hermeneutical information is that which we acquire from words or the accounts of other folk. History is evaluated almost entirely hermeneutically, and most internet research, library research, and scholastic examination, is simply hermeneutical. So when someone claims 'Relativity has been proven empirically', they would need to have actually done such an experiment themselves – because if they then reference an academic paper or website claiming empirical proof, then that is simply not empirical.

They would then need to also direct the reader how to perform such an experiment personally. If this is not possible, for whatever reasons, and they insist that we should accept their claim as being empirical, then they are certainly guilty of not understanding what the word 'empirical' actually means. Such a person would be guilty of esoteric belligerence: dogma.

Now often all the information we have access to is here-say, so it is not that Hermeneutics is bad or wrong. It is just often unreliable. But it does have the broadest scope. Empirical observation and logic are both slow and narrow. And we almost always have to use the Hermeneutical method as our first step before we can begin the arduous process of observation and measurement which philosophically is often called: Logical Positivism.

Now when empirical claims are beyond the reach of the ordinary person, we still have the powerful process of logic to be able to determine which accounts are internally reasonably self-consistent to their own claims. In this way, logic is the most vital method – because anybody can use it to see which claims are false even when they do not have access to the esoteric '*empirical*' claims typically made by copy-paste theorists.

So let us get back to the physical Universe, and how it will be easily proved that a wide variety of other theories are illogical; except for Sum Theory. This is because nobody else seems to have applied the basic principle of Sums to those essential parameters of the Universe that one must be certain of, before computation can begin. And these are: density, mass, volume and radius. Inherent within these concepts is the *shape* of the Universe.

[ϕ] Metaphysics is not paranormal physics – it is the discussion as to how it is possible to assess what is or is not physically true. Paranormal physics may be assessed by metaphysics, or be part of such a discussion, but so is normal physics part of such a discussion.

17

SHAPE OF THE UNIVERSE

How can you imagine a 4d-hypersphere with a 3d brain?

The Universe has an unusual shape to it. To understand this shape, we have to consider ancient people trying to comprehend the Earth being spherical. For them, the Earth appeared flat. But the real shape of the Earth could be better described as a flat 2d-surface *on top of* a 3d-sphere.

By the same token our Universe is a 3d-hyper-surface, *on top of* a 4d-hyper-sphere. Now where Sum Theory differs from Relativity, is that time is not considered a true dimension. Here, time is immaculate – it is not conflated with space in the same way that the Relativists use the term 'space-time'. So in Sum Theory, the 4th dimension is actually another dimension of space. Time is something else entirely. This 4th dimension of space is not quite the same as the 3 dimensions that we commonly observe. Light and gravity move along our 3d-hyper-surface, and are only very marginally altered by the curvature of the 4th spatial dimension.

In this sense, Sum Theory is certainly easier to comprehend than Relativity because there is no bamboozling conflation between space and time like there is in Relativity. So to picture how Sum Theory conceptualizes the shape of the Universe, all we have to do is envision how the Earth appears to be flat, but is in fact a sphere, and then simply add another dimension of space. That is much easier to do mathematically, than it is graphically, because we are very bad at being able to imagine something that we have not clearly observed before. But, like most things, with time and practise – it does get easier.

The reason why Sum Theory replaces space-time with 4d-space, is discussed at length in previous chapters. Here, all we need to appreciate is that when astronomers observe that the most distance galaxies are retreating from us at highest velocities – the analogy of the inflating balloon is most apt. So by similar analogy: if the Earth was hypothetically inflating then the further away an object was from the observer, the faster they would appear to be moving away from each other. So no point on the surface is at the 'centre'.

Of course light and gravity would need to bend slightly with the 3d-hyper-surface. In Sum Theory light and gravity are both confined to the 3d-hyper-surface. We know this because light and gravity both obey the inverse of the square law. If light or gravity were transmitted through 4d-space then they would obey the inverse of a cube law.[δ]

So our 3d-Universe is trapped 'on top' of a 4d-shape, much the same as a 2d-surface is fixed 'on top' of a sphere. Thus, in order for the Universe to expand, it must be constantly increasing its *hyper-volume* in truly 4d terms. The big assumption I make is that the amount of '4d-stuff' that is inflating the Universe is doing so at a constant rate. This may prove to not be constant, but the discrepancies in the rate of expansion are so varied that I can see no solid reason to consider it one way or the other.

Adjustments may be required when the data becomes better; but for now we'll just assume it inflates at a constant *rate of energy*. The 4d-stuff inflating the Universe, is thus actually one aspect of dark energy. It appears as if dark energy consists of two different features – because I have already demonstrated that dark energy is also 'spin'. This was the only way that uniform orbital structures could appear throughout the Universe: if the mass of the Universe was spinning at an increasing rate at the very beginning. (See previous chapters).

The possibility of an open-ended Universe consisting of endless 3d-space, also needs to be considered. This is the obvious observation, much like it is obvious that the 'Earth is flat'. If we take this as a premise we reach the conclusion that the rest of the Universe is receding

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[δ] See Chapter XIV – 'Stephen Hawking's Dog' for a more detailed discussion on this.

from our particular vantage point, making us the centre of the Universe due to the increasing red-shift of galaxies furthest from us.

Whilst not illogical, we can safely conclude that this is unlikely for purely inductive reasons. That is why the only alternative has to be that the Universe is a 4d-hyper-sphere – because then the 'edges' of the 3d-Universe must wrap around in 4d-space much the same way that a 2d-surface has no edge if it wraps around to form a 3d-sphere. That the Universe is expanding, leads to the apt analogy of an inflating balloon.

Now one of the features of an inflating balloon is that *if* the air is *entering at a steady rate*, then it appears from the perspective of diameter that the early stages expand most rapidly. And at the later stages, expansion seems to slow down. So it is a matter of perspective as to whether or not the rate of expansion is slowing down, or increasing. The key question being: Are we considering this from the perspective of diameter over time; or from the perspective of volume over time; or energy over time? None of the other theories seem to account for this detail.

So there are two vital formulae for calculating the shape of the Universe:

$V_4 = \frac{\Pi^2 r^4}{2}$	**4d-Hyper-volume of a 4d-Hyper-sphere**
$V_3 = 2\,\Pi^2 r^3$	**3d-Hyper-surface of a 4d-Hyper-sphere**

You may wish to compare these two formulae to the formula for a 3d-sphere and the formula for the 2d-surface of a 3d-sphere. They may be similar but they are not the same. So at this point we need to consider the next aspect of the size of the Universe: its density.

18

DENSITY OF THE UNIVERSE

Escape velocity is only meaningful if there is empty space to escape into.

A central reason why it is difficult to determine the density of the Universe is that its shape is quite confusing. Contemporary theories as to the density of the Universe all seem to rest on the starting premise of 'Critical Density'. Critical Density hinges on the notion that below a certain density, the Universe will contract due to gravity, and above this density, the Universe will expand forever.

Sum Theory postulates that the Critical Density of the Universe is irrelevant to whether it will expand or contract. But before analysing the Critical Density, we must look at how the density of how the Universe either 10^-19 kg/km^3 or 3x10^-18 kg/km^3:

Density of the Universe:	10^{-19} kg/km^3 (10^{-28} kg/m^3)
	? or 2.7×10^{-18} kg/km^3

To assess this we need to first approximate the ***Local Galaxy Density***: which is the mass of the Milky-way dispersed over a volume of space extending to the nearest *major* galaxy (Andromeda). 6x10^42kg[⊗] per 2x10^19km (linear) is distributed over 3d space, which

[⊗] Universetoday.com

becomes the mass of the Milky-way per 8x10^57km^3. So the average density within our local cluster of galaxies is about 7.5x10^-16kg/km^3.

Next we examine the average distribution of galaxies in the Universe, and after perusing numerous accounts of the matter I reach an estimated average that suggests that typically Andromeda is about ***6.5*** times closer than the average distance between major galaxies.[ϰ] This is because galaxies congregate in clusters. So because we are examining 3d-space, we divide the ***Local Galaxy Density*** by 6.5^3 which means that Sum Theory reaches the answer that the Universe has a density of about 2.7x10^-18 kg/km^3.

19

CRITICAL DENSITY OF THE UNIVERSE

It takes the same time for two equal-density structures to coalesce under gravity.

There are several reasons as to why I claim that the popular concept of a Critical Density[∅] to the Universe is simply wrong. This is quite distinct from the assessment as to the actual density of the Universe itself, and also different as to how the Critical Density is calculated.

Critical Density of the Universe: 2×10^{-17} kg/km^3 ? or 5×10^{-17} kg/km^3

#1: The most obvious misunderstanding of the Critical Density is that at some earlier time, the actual density of the Universe is going to be more than the Critical Density of the Universe, regardless of the amounts concerned. Many claims are made that the Universe is currently at that Critical Density. So how could the Universe have expanded to the current density from a state that was denser – if that more dense state would have made it impossible for expansion to occur?

#2: The role of orbital structures has simply been ignored. The concept of Critical Density typically hinges on radial attraction between bodies. If two masses are in an orbital structure, they will not pull together into a single entity; they will orbit one another indefinitely. Previously I examined the role that the various theories of Relativity play in this. But regardless of that, the actual mathematical process by which Critical Density is arrived at *simply ignores **all** orbital structures completely*. This type of error occurs because of fixation on regurgitating math in scholastic 'exams', rather than individuals wilfully and freely constructing observable computer algorithms themselves – which requires a wider scope for the imagination to *contextualize* the math into a single over-arching logical structure. If the motive for study is personal it is authentic. The alternative is academic toadying.

#3: In the previous section the concept of ***Local Galaxy Density*** was introduced. If we distribute the mass of the Milky-way over a volume of space extending to the nearest major galaxy then the density of the local region of the Universe is 7.5x10^-16kg/km^3. So if Critical Density prevents expansion, then the local galaxies should have contracted into a single entity a long time ago.

#4: The density of our solar system itself is far more than the Critical Density of the Universe. But because our solar system has ***orbital structure*** – the planets do not simply collapse into the Sun. Instead the planets orbit the Sun.

[ϰ] Ohanian, p11 has it as about 7x, but various recent online accounts suggest 5x. Discrepancy could persist between what is a major and what is a dwarf galaxy. This aspect has the greatest amount of wiggle-room.

[∅] Universetoday.com

#5: A 4d-structure makes Critical Density unworkable. Consider the balloon with gravity attracting only along the surface. Because all objects attract all other objects, every pull in one direction is counter-acted by a pull in another direction. Critical Density hinges on the notion of escape velocity. Escape velocity implies that there is empty space that the object can escape towards. Objects in a Universe that wraps around have no space to escape into. So escape velocity for the whole Universe is meaningless if we have a closed Universe.

#6: Even if we ignore the previous arguments, and simply look at how long it takes for bodies at the Critical Density to coalesce under gravity, the amount of time is higher than the age of the Universe. So regardless of theoretical context and philosophical reasoning, their sums are just plain wrong anyway.

So we let us examine how long it takes for 1kg of matter at the 'Critical Density' to coalesce when dispersed over space.

To do this we invert the Critical Density and then cube root that volume:

Distributing the Critical Density of the Universe into 2 objects separated by linear space:	Sum Theory: Distributing the 'Critical' Density of the Universe into linear space:
$2x10^{-17}$ kg/km^3 =	$5x10^{-17}$ kg/km^3 =
2kg per 10^{17} km^3 =	5kg per 10^{17} km^3 =
=1kg per volume of $5x10^{16}$ km^3	1kg per $2x10^{16}$ km^3 =
The cubed-root of the volume leaves a linear distance between the 1kg objects of	The cubed-root of the volume leaves a linear distance between the 1kg objects of
$3.7x10^5$ km (370 000 km)	$2.7x10^5$ km (270 000 km)

How long do the two objects take to attract together under gravity?

The two objects of 1kg each must be placed about 370 thousand kilometres apart according to popular astrophysics to counter the expansion of the Universe, whereas in Sum Theory they need to be just 270 thousand km apart. These distributions in linear space thus represent the claims to Critical Density. Then we apply gravity and we wait and see *if* it takes the age of the Universe for them to pull together.

There is a beautiful and neat feature of how gravity and density interact that needs to be elucidated. Scenario [31] and Scenario [32] of the OGS12 algorithm (***orbit-gravity-sim-12.exe***) both represent the Critical Density according to Sum Theory.

However in Scenario [31] it is a pair of 1kg objects 272 400 km apart, whereas in Scenario [32] the pair of objects are 1000kg at a distance apart of 2.724 million km. They both give the required time of about 13.7 billion years to attract. The amazing thing is that ***when the density is the same, the time it takes them to attract together is also the same.***

The actual volume and mass make no difference to the time it takes for them to attract together. So long as the volume and mass are at the same proportion, the time to coalesce is identical. I am uncertain if anyone has noticed this before, so I'll just call it the ***Beautiful Attraction Principle***.

So when I place the popular astrophysics amount of Critical Density into Scenario [33], I am really just being thorough. I do this because the way in which popular 'Critical Density' has been calculated seems to ignore how easy it is to actually determine what it should be. Certainly, all the other ways for determining Critical Density seem to suggest that it is important to know the volume and mass of the *entire* Universe.

All that is actually required is the age of the Universe and a simple calculation. But, of course Critical Density is actually a failed concept for reasons #1 to #5 outlined earlier. Nevertheless, when we take the Critical Density of popular astrophysics to be 2x10^-17

kg/km^3 (or 2x10^-26 kg/m^3) we get the result that it will take the pair of 1 kg objects at 370 thousand km apart an enormous 21 billion years to completely attract one another.

And it is this feature I have called the ***Beautiful Attraction Principle*** that makes everything so much easier. Because it does not matter how much space and mass we are dealing with. Regardless of whether it is 1 kilogram, 1 ton, or all the mass in the Universe – if the density is the same, the time it takes to coalesce is identical! But of course, this is only true for *horizontal* linear movements and does not at all take into account: orbital structures or collisions. A small amount of contrary velocities *vertically*, leaves them in an orbit that never contacts one another! So the time to coalesce here is a minimum time. The real time will always be more than this anyhow.

Next we have to consider the rate of expansion too. The OGS12 algorithm and the ordinary formulae (in the section to follow) only compute a static un-expanding Universe. But if we consider that some expansion in the past counterbalances some expansion in the future, we still get the Critical Density for *now*.

So let us double-check all these results using conventional formulae:

20

TIME FOR TWO BODIES TO ATTRACT IN NEWTON'S GRAVITY

Which is the better formula: The popular one?

There is something of a disagreement on various websites as to what is the correct formula for calculating the time it takes for two bodies to attract under gravity. The formula following is in perfect agreement with the OGS12 algorithm (orbit-gravity-sim-12.exe):

Time for 2 bodies to collide under Newtonian gravity
(physics.stackexchange.com)

$$t = \Pi \sqrt{\frac{r^3}{8G(M+m)}}$$

Most websites offer this incorrect formula:

Wrong formula for
Time for 2 bodies to collide under Newtonian gravity

$$t = \sqrt{\frac{2\,r^3}{G(M+m)}}$$

So how do we decide what is the correct formula? Well the OGS12 algorithm uses the most ordinary equations for gravity (g=m/r^2) then simply allows time to compute in a purely evolutionary manner – and this program gives excellent results to within a matter of millimetres for the orbits of the Moon, the Earth and other planets – even when not running at its most precise rate of computation.

So if we consider the data from the previous section, and place it into the correct exact formula so that we can establish:

{A} How long it will take for gravity to attract a pair of 1kg objects if they are:
272 400 km apart – the answer is 13.7 billion years.

{B} How long it will take for gravity to attract a pair of 1kg objects if they are:
368 400 km apart – the answer is over 21 billion years.

Now for ***{A}*** the *mass-per-volume* is 1kg per 2x10^16 km^3,
and for ***{B}*** the *mass-per-volume* is 1kg per 5x10^16 km^3.

So if we invert those amounts we see that the ***volume-per-mass*** is then:
{A} 5x10^-17 kg/km^3
{B} 2x10^-17 kg/km^3

Be careful of the detail in those last two conversions. When we are converting the amounts from *mass-per-volume* to ***volume-per-mass*** we should do this one step at a time like this:

{A} 2×10^{16} km^3 per kg
= 2 km^3 per 10^{-16} kg
now divide 10^{-16} kg by 2
= 5×10^{-17} kg/km^3
'Critical Density' - Sum Theory

So because we have determined the Universe is 13.7 billion years old, the critical density can only be 5x10^-17 kg/km^3 ***{A}***, whereas ***{B}*** yields a density that will coalesce in a much longer time than the age of the Universe.

But this is a redundant calculation anyway because it does not take into account orbital velocity structure or collisions! This is easily demonstrated by inserting the mass of the Sun and the Alpha Centauri pair, with a distance of four light-years, into the formula for calculating the time it takes for them to attract under gravity.

It was a fair surprise to realize that it would take less than 17 million years for the Sun to collide with Alpha Centauri. So the Sun and Alpha Centauri have to share an orbital structure of some sort, or this sort of attraction would make collisions between stars a fairly commonplace occurrence, and I have never heard of such events locally.

However, Alpha Centauri is receding from us at 20km/s so in a million years it would be well over 60 light years away. And it is this non-radial velocity which completely overpowers the very concept of 'Critical Density'. We can also see here, just how weak local gravity is in comparison to orbital velocity on the galactic scale. Where did that orbital velocity come from? Not from gravity, because gravity is far too weak.

Another amusing example we can use is two 75g objects 10cm apart. They would take about 3 hours to attract together due to gravity. Now the ***Beautiful Attraction Principle*** (see previous section) shows us that if two objects, one of 100kg, another of 50kg, are 1 meter apart, then under gravitational attraction it would also take about 3 hours for them to make contact. This is the same for two 75kg objects 1 meter apart. Or, an object at 85kg and another at 65kg at 1 meter would yield an identical result. All of which sounds about right if you know what I mean *(nudge-nudge-wink-wink).* This is because the density in all these examples is identical.

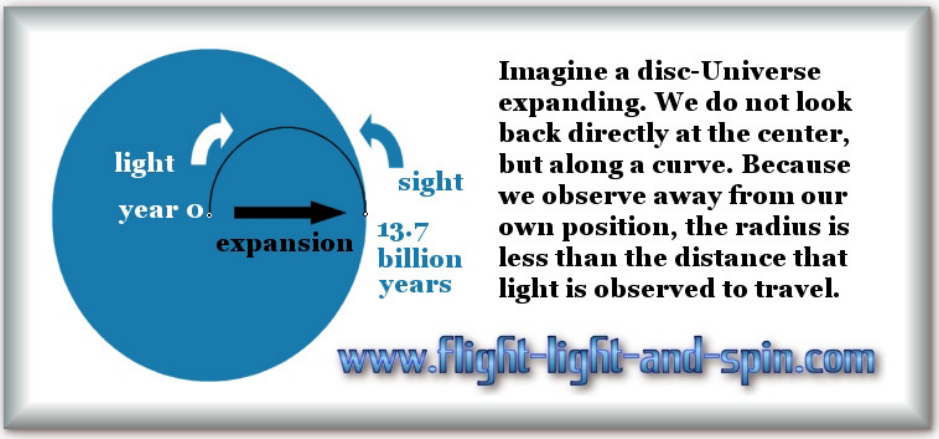
21

VOLUME OF THE UNIVERSE

The ratio between radius and circumference is the same in 2d, 3d, or 4d.

The shape of the Universe has been established as a 3d-hyper-surface of a 4d-hyper-sphere. But if we are dealing with a 1d-Universe on the edge of a 2d-disc, or instead of this we also consider flatland: a 2d-Universe on the surface of a 3d-sphere; then the ratio between the diameter and the circumference is still Π (pi). So it stands to reason that this same ratio of pi is still perfectly good for a 4d-hypersphere.

However when we look back to the origin of the Universe, we are not looking back directly along the radius. We are looking outwards, and then back. Consider this diagram very slowly and carefully:



The inhabitants of a disc-Universe live on the 1-dimensional edge. If the light could travel directly along the *radius of expansion*, they would see themselves in the past. But instead they see objects a distance away from them on the expanding edge. So the light cannot travel directly from the centre to the edge along the *radius of expansion*.

This may be difficult to comprehend at first, but once you see it, then it should be fairly easy to conclude from this premise that: The radius is thus 13.7 billion light-years divided by half of pi:
Radius = 8.72 billion light-years or 8.26 x 10^25 meters.

Calculating the volume is a bit trickier because we need the formula for the 3d-hyper-surface of a 4d-hyper-sphere. Of course the 4d-hyper-volume is not the same as this because that would be a measurement in **m^4**, whereas a 3d measurement results in **m^3**.

$$V_4 = \frac{\Pi^2 r^4}{2}$$

4d-Hyper-volume of a 4d-Hyper-sphere

$$V_3 = 2\,\Pi^2 r^3$$

3d-Hyper-surface of a 4d-Hyper-sphere

This is also not the same as a simple 3d-volume either because our Universe has no visible 3d-edge to it like all 3d-volumes do actually have.

So the volume of the Universe is 1.1x10^79 m^3 or 1.1x10^70 km^3:

Volume of the Universe: $1.1 \times 10^{70} km^3$ ($10^{79} m^3$)

Although, some would claim that 4d-space is an untenable idea. So is it meaningful to postulate the possibility that space is just ordinary 3d-space? In this sense, the galaxies would all be receding from our current position into an endless void. In this scenario, all the mass in the Universe (3x10^52kg) could have at some point been contained in a small spherical volume of space smaller than the distance to the nearest star. At this point it would have had the average density of water. But then the escape velocity would have been 70 000 times the velocity of light. The obvious problem here is that such a theory would not be able to allow for the Relativistic notion that velocity cannot exceed the velocity of light.

But what would the radius of the mass of the Universe need to be, such that its escape velocity is equal to the velocity of light?

Formula for escape velocity $$V = \sqrt{\frac{2Gm}{r}}$$

Radius of 3d-Universe with escape velocity at the velocity of light $$r = \frac{2Gm}{C^2}$$

And it is quite a surprise to find that the mass of the Universe would need to be 4.7 billion light-years in radius to have an escape velocity of the speed of light. If you are a die-hard Relativist may need to think about that in the context of how you have conceptualized the Universe when it was less than 4.7 billion-light-years in radius.

22

MASS OF THE UNIVERSE

If the mass of the Universe was the density of an ice-cube then it would fit in the space between us and the nearest star.

Previously we calculated that the volume of the Universe is 1.1x10^70 km^3.
And the density was seen to be 2.7x10^-18 kg/km^3.
So the mass must be: 3x10^52 kg.

Mass of the Universe: 3×10^{52} kg

The reason why Sum Theory differs from all the other theories is that here Mass, Density, Volume, Radius, and the *Shape* of the Universe all add up precisely. If I had found another theory which had done this completely, I would have had nothing to say on the matter. The key features here are that the shape of the Universe does not seem to have been adequately appreciated to be a 3d-hyper-surface of a 4d-hypersphere. And also the straight-line radius is not the same as the curved distance light has traveled to reach us from the origin. (See previous section).

23

SIZE OF THE UNIVERSE

A straight line in 3d terms is not necessarily a straight-line in 4d terms.

The circumference of the Universe is **54.8** billion light-years.
This implies that the 4d radius is **8.72** billion light years.
The shape of the Universe is: a ***3d-hyper-surface*** on top of a 4d-hyper-sphere.

The relationship between the radius and the observed distance light has traveled (13.7 billion light years) appears paradoxical. This is because the light has not traveled in a straight line through 4d-space, even though it appears to have traveled in a straight line through 13.7 billion light-years of 3d-space. Instead light travels in a 4d-curve. (See sections previous).

The volume is: 1.1x10^70 km^3.
The density is about: 2.7x10^-18 kg/km^3.
The mass is: 3x10^52 kg.

I am most certain as to the accuracy of the volume, whilst other theories of the mass seem to get the same result as I do. Though I have not yet seen any other account that offers details on how this is attained.

24

HOW DO BINARY STARS FORM?

Random interactions will not form half the stars as binary-systems.

Half of stars exist as binary pairs. The issue at the centre of Cosmology and astrophysics that is almost entirely overlooked by all other theories is that star-formation and galaxy formation hinges intrinsically on how binary star-systems form. And only Sum Theory has even ventured an entirely non-contradictory answer to this question.

The algorithms OG3, OG6 and OG7 have clearly shown that if two bodies have no pre-existing orbital structure – then they can ***never*** form a binary structure as a result of just their own momentum and gravity. Some other force or body is required to interfere and *make* them form an orbital structure.

Furthermore, binary systems *almost never* form in randomly positioned object-dense scenarios. On the very rare occasion that a binary pair does form due to interaction with a third body, then a fourth body will inevitably destroy the binary orbit. ***Vitally, celestial bodies cannot simply 'capture' one another.***

The odds that half of *all* stars would form binary pairs due to chance encounters in stellar-dense space are too impossibly remote to even calculate. Even if this remote chance is reluctantly taken to be a foundation premise, and binary star-systems and solar-systems had formed from randomly moving small particles in the chaotic aftermath of the 'Big Bang' then planetary orbits would be highly eccentric, and often at right-angles to one another – and that is only if a ridiculous set of coincidences enabled them to form at all.

If small asteroids collide, they should shatter or bounce off one another on more occasions than combine. This is because small asteroids have very little gravity which would cause tiny amounts of attraction by comparison to the velocity required to frequently bring them into contact with one another. That is why planetary rings and the asteroid belt have not formed moons or planets. Gas clouds cannot coalesce into binary pairs anymore than throwing a handful of sand in the air can result in it falling to the ground in two neat piles.

Certainly it had been proven to me in OGS2 that after planets have formed, a solar system structure with neat gaps between the planets on a flat *ecliptic* plane can sustain itself much more easily if every second orbit is in a counter-clockwise direction. This is because bodies in this structure would spend less time in the range of gravity that is strong enough to pull them together. (You will probably need to experiment with *orbit gravity simulators* to appreciate this). But it is certainly clear that orbits at right-angles to one another will attract each other less than orbits on an ecliptic plane. A symmetrical solar-system like ours is thus the least likely result of just gravity and randomness.

Even the axial rotations of celestial bodies are mostly uniform in direction, and a reasonable degree of symmetry in their rates of rotation has been observed, such that larger planets like Jupiter and Saturn rotate much faster than smaller bodies. If planets had formed from

random collisions of smaller bodies then such axial rotation would cancel out after numerous random collisions. Thus random collisions would yield the largest bodies as having the slowest axial rotation.

Moreover smaller bodies would rotate less uniformly when compared to one another if they formed from random collisions. Compare the striking similarity of the axial rotations of Mars and Earth, for example. Now compare the similarity in axial rotation of Jupiter and Saturn. Such uniformity can only come about if those similar planets formed from similar origins.

Careful study of orbital structures in computer algorithms has shown that a uniform solar system with such neat orbital directions could only form if one of a binary pair of stars had gone 'nova' – or disintegrated through other means. The formation of numerous uniform orbital systems of moons all on the same ecliptic plane could only result from the Sun's dead twin having been spinning rapidly at the point it fell apart – perhaps even falling apart due to excessive spin.

So the question now shifts from how planetary systems form – to how binary stars form. The only conclusion from years of constructing algorithms depicting orbital structures has been that they started as a single object that split in half due to (or in addition to) a massive amount of (possibly increasing) axial rotation. The problem here is that a newly formed binary pair of stars in close proximity needs a reason to expand further apart.

If we take the expansion of the Universe as this reason, then we need to find a reason for the stars to slow down proportionally to the distance they drift apart. Because if they maintain the same high orbital velocity that they parted with, then as they drift apart due to expansion, they will eventually reach escape velocity from one another.

So it seems that when binary stars form they do so in the midst of large amounts of stellar gas, which slows down their velocity at a proportional rate to that with which they drift apart. That is quite a neat coincidence. And yes, this is all quite vague still, and it will be explored properly in a computer algorithm at some point in the future. The point for now being that: the orbital structures required to give rise to so many binary pairs has never been fully understood. The odds of even 2 in a 1000 stars being binary systems due to random interactions is actually virtually impossible.

Inherent in understanding how binary orbits form, is how galaxies form in such well-structured shapes so early in the Universe. Only Sum-Theory has offered a non-contradictory solution for this from what I have seen.

Let us scratch this surface somewhat. Consider that our galaxy near its birth had a diameter of about 50% wider than the solar system. Here the proto-galaxy would have a density equal to water, making it marginally less dense than the Sun is currently.

At this point it would have had an escape velocity of 30 times the velocity of light. So according to the Relativists this could not have resulted in it expanding further. Of course the Relativists have not noticed this, and quite happily theorize that the entire Universe at one point was indefinitely small. Actually the entire Milky-way galaxy would need to be of a radius more than a light-year to have an escape velocity less than the velocity of light.

But it is the structure of the proto-galaxy which is so vital to discover. Common observations of the early Universe have galaxies forming within a very short time. Thus star systems – and by implication binary star systems – would also have to have formed very early on. The theoretical answers postulated so far still need further development, and this section is still vastly incomplete. But it still ventures far beyond any other theory on the matter.

Most other theories simply assume that random particles will form the known celestial structures purely from the force of gravity. And that is the 'science of the gaps' at its most crude. That anyone can assume such answers without computational algorithms and a

solution to n-body Newtonian gravity fields is about as weak as any theorizing can get on the matter.

Future algorithms will endeavour to show that the answer as to how binary star-systems form; is the fundamental sub-structure underpinning how it is that early galaxies have such non-random shapes. I can not see any other viable foundation for this, other than binary pairs forming out of a single body, by separation due to (or in addition to) excessively increasing spin.

But if one of a binary pair of stars goes nova, then a solar system will certainly form from the debris. And such a solar system will have planets and numerous moons orbiting in the same direction, on a flat ecliptic plane, with similar axial rotation to one another. The amount of randomness would have to be proportionally very small in comparison to the inherent spin of the structure. That much is certain beyond any doubt even at this primitive stage in the formulation of the theory.

25

PROJECTS FOR STUDENTS OF SOFTWARE DEVELOPMENT:

How many astrophysicists know how to develop evolutionary algorithms?

Here is a list of orbital gravity computer simulations already built and some still to be built:

1) A simple algorithm with one body in orbit around another in real-time.
2) A binary pair of stars in orbit around each other.
3) Three or more solar bodies interacting with three or more gravity fields. (This requires a solution to the n-body problem for Newtonian gravity).
4) A solution to the problem of rotation curves of galaxies.
5) A Sun, Earth, and moon system. Such that the effect of the Sun's gravity on the moon should be realized as a pull away from the Earth. This should not be to a correct scale in order to be more easily observed.
6) How the Solar System could have formed due to interaction between bodies of various sizes. Use random starting positions here.
7) How the Solar System probably formed due to one of a binary pair of stars going nova. The orbital velocity of the nova star gives rise to the orbital structure of the planets as it breaks apart.
8) How would the orbits of planets look around a binary pair of stars?
9) Examine how quantum time changes an eccentric orbit at perihelion. Is this quantum gravity?
10) Gravitational lensing. Demonstrate how the direction of parallel photons is changed by gravity such that gravity magnifies an image.
11) Examine the claims of the LIGO binary-black-hole merger in an evolutionary algorithm. This should have a scale with a 10% error-margin.
12) How does General Relativity and Special Relativity change the shape of the orbits of the planets in the solar system? Also show how gravity moving at the velocity of light from General Relativity changes the orbital structure of a binary star system like Alpha Centauri. This requires sliding scales for distance and time with accuracy better than one part in a million-million.
13) An evolutionary algorithm of the solar system with an accurate sliding scale for time and distance which demonstrates an n-body solution to Newtonian gravity which is accurate to better than one part in a million. The precise pull by the Sun on the Moon's orbit should be demonstrated, as well as how Jupiter changes the orbit of Mercury.
14) Binary Star formation.
15) Planetary ring formation.
16) Gee
17) Trojan asteroids.
18) Lunar orbital eccentricity. Is it a real or an algorithmic phenomenon?
19) Demonstrate aspects of the Big Bang in an algorithm showing how galaxies attain structure amidst the chaos of an explosion (or not chaos).
20) Simulate the movements of galaxies, and how they interact with one another.

21) Do it all from the beginning again, but this time in 3d-space or even…
22) 4d-space.

The first 12 steps I have completed. How far are you Mr Critic?

26

RELATIVITY SIMULATOR:

Has anyone else ever applied a velocity of gravity to a solar system algorithm?

Critics have typically attacked this type of software on the basis that it runs at fairly mediocre pace, only 60 iterations (or sides to the polygon-orbit) per second. Other programming languages like C or assembler would be able to perform the same task incrementally faster. However, such criticism is always made by those who have not constructed such an algorithm. The crucial point being that the time it takes the programmer to construct the algorithm was never considered by the critic.

This entire chapter, more than two dozen web-pages, the coding and testing of the algorithm, as well as the theoretical physics itself, has been completed inside a year by one person. If the user needs to wait a few minutes for the orbit to evolve, then that is preferable to the programming process requiring decades by *teams* of programmers as has been *attempted* by the Numerical Relativists.

And because the broth cooked up by the Numerical Relativists had so many cooks, the meal was spoilt because their *committee* never noticed the physical geometrical logic that gravity moving at the velocity of light ***must*** have on a binary orbit. They used the fastest and biggest tool instead of the most efficient tool, and thus their time and concentration was wasted by solving programming problems instead of solving physics and geometry problems. It must be reiterated that no other algorithm in existence factors in the time delay that gravity travelling at velocity *would* have on the shape of an orbit.

The Numerical Relativists neglected to realize that gravity moving at the velocity of light would cause a binary orbit to distort away from the shape of an ellipse in the region of a million times greater than any other aspect of Post-Newtonian theory. They simply failed to conceptualize BOGVOS. No doubt this was the result of them using advance programming tools before they had completed the conceptual ideas in a more user-friendly programming language like Visual Basic 6.

Why this is a better process was because at no time was I solving programming problems. All my focus was on understanding the geometry, and not translating Physics theories into a computer language. The software development was a seamless process, because after decades of experience in one language, one becomes fluent to the point where the computer code virtually vanishes from one's thoughts. All the focus is on astrophysics, Cosmology and the imagination.

BOGVOS is in retrospect so obvious and so over-looked that it is simply a case for the Numerical Relativists of not being able to see the wood for the trees. The full impact on the scientific community for the utter lack of rigour in applying their scientific method could itself take decades to be realized in academic and psychological terms. Once tunnel vision sets in, humans have this tendency to not look up. They have completely ignored the details of any claim that even remotely suggests that they have erred.

Or was it that their error was a deliberate educational tool? A method similar to reverse-psychology designed to show up the copy-paste scholastic mob for what it is? Given how the norm in academia is a mindless herd-instinct, it would not surprise me at all if Numerical Relativity is an educational ruse. I can certainly recall catching out students following blindly with a similarly devious method myself on more than a few occasions. Be aware that there is a vast difference between the physics itself – and the psychology of the process whereby the physics is imparted.

Most of the physics regarding debunking Relativity had already been worked out in the previous algorithm OGS11 (orbit-gravity-sim-11.exe), the details of that are explained in the previous chapter. The consequences in that chapter are actually far more profound in a truly positivist sense than the concepts here.

This chapter merely takes the role of a more easily explained narrative. It is a more accessible and accurate computational analysis with a wider scope of application to a broader set of more everyday examples: our solar system and the Alpha Centauri binary. The next chapter and algorithm will possibly be to combine the precise scales for time and distance developed in OGS12 together with my solution to the N-body problem from earlier algorithms like OG8. It will then be determined precisely the effect that Jupiter will have on the orbit of Mars and Mercury. Also, can the Sun tugging at the orbit of the Moon around the Earth justify NASA's famous 38mm per year claim for outwards movement away from the Earth?

It may be that exploring how binary stars form will be more inspiring than demonstrating the precise formation of planetary rings, asteroid belts, and the uniform orbits of moons. N-body gravity for the solar system will eventually form a single seamless evolution. It is likely that such a process of development will uncover other gravity interactions not yet imagined.

Section 25 of this chapter suggests a wide variety of potential algorithms. It may be that other ideas come to light after publishing this chapter. But for certain, such theories will never be complete. What OGS13 will look like, I do not know exactly. What OGS42 may look like is my wildest dream.

Here is a brief summary of each Scenario in the OGS12 algorithm:

[1]: A binary pair of white dwarfs; each the mass of 2 suns Note how General Relativity causes a gravity delay, which results in a visible difference between the gravity origin (orbit-line) and the center of each star (position). The out-spiral is clear on this scale.

[2]: Alpha Centauri binary with General Relativity.

[3]: Jupiter with Newtonian gravity.

[4]: Jupiter + Einstein's General Relativity.

[5]: Mercury + Special Relativity.

[6]: Moon and Earth according to Newton; at a highly exact measurement.

[7]: Moon and Earth according to Newton.

[8]: Moon and Earth with General Relativity. The moon would drift away at about 400m per orbit if traveled at the velocity of light.

[9]: Moon and Earth with Special Relativity.

[10]: Earth: Orbit around Sun of combined Earth-Moon barycenter.

[11]: Earth: Combined Earth-Moon barycenter orbit around Sun according to Einstein's formulae applied from both General and Special Relativity.

[12]: Earth: Combined Earth-Moon barycenter orbit around Sun with Special Relativity.

[13]: Contrary to LIGO claims, with gravity moving at the velocity of light, binary orbits spiral outwards. This scenario shows what the LIGO gw150914 binary black-theoretical data should look like when effected geometrically by gravity traveling at the velocity of light.

[14]: Jupiter + Special Relativity.

[15]: Satellite 'Daedalus' approaches the Sun.

[16]: Mars with Newton.

[17]: Mars with Special Relativity.

[18]: Mercury + Newton.

[19]: Mercury, Special Relativity and General Relativity.

[20]: Mercury and General Relativity.

[21]: Earth: Combined Earth-Moon barycenter orbit around Sun. 1 hour process for 1 orbit; to demonstrate scale accuracy.

[22]: Venus orbits the Sun according to Newton.

[23]: Venus orbits the Sun according to General Relativity.

[24]: Alpha Centauri binary and General Relativity with increased accuracy.

[25]: -Alpha Centauri binary with applied equations from Relativity, starting 100x closer than in reality (inside the orbit of Mercury apart).

[26]: Pseudo-Alpha Centauri binary with Relativity, starting 100x closer than in reality, but with less eccentricity.

[27]: Pseudo-Jupiter + Einstein's General Relativity. Start at Earth's orbit for good measure.

[28]: Earth: Combined Earth-Moon barycenter orbit around Sun. 10 hour process for 1 orbit; to demonstrate scale accuracy.

[29]: Alpha Centauri binary with Newton.

[30]: Centauri binary with Special Relativity.

[31]: Sum Theory's Critical Density - static Universe: 2 gas clouds each 1 ton.
Density = 5*10^-17 kg/km^3. How long before contact due to gravity?

[32]: Sum Theory's Critical Density - static Universe. 2 gas clouds each 1 kg.
Density = 5*10^-17 kg/km^3. How long before contact due to gravity?

[33]: Critical Density test: 2 stationary gas clouds each 1kg.
Density: 2*10^-17 kg/km^3. How long before contact due to gravity?

You can alter these scenarios as you require, switching the various theories on gravity on or off so that you can see the results yourself. Not all the planets in the solar system have been analyzed, but eventually all the major bodies will be spliced into one single algorithm. There is nothing at all preventing that here conceptually speaking, because the code has already been worked out. Prioritizing what to do next is quite a challenge.

The gravitational constant was a thoroughly fascinating problem and I could easily write an entire chapter on just that. But the small changes to G make no difference to the principles in this chapter because everything is proportional. A huge amount of trial-and-error was endeavored due to the numerous various claims on many websites as to what the parameters of the planetary orbits actually are.

The most reliable data should be the orbit of the Earth and that should set the tone for determining G for the rest of the orbits. However, despite much searching I could find no website that took into account how the Moon alters the Earth's orbit. Typically if the Earth is at its furthest from the Sun during either full moon or new moon, this would result in a large difference of more than 9000km.

No website encountered even mentioned this difference when offering their version as to what the maximum and minimum distance from Earth to Sun is. The upshot is that I used four different quantities for G in various scenarios depending on which gave the results closest to commonly published data. Future studies can improve on this if better articles can be found for historical data of the Earth's orbit. So G could be near any of these amounts:

G = 6.67408 6.67392 6.67388 6.67384

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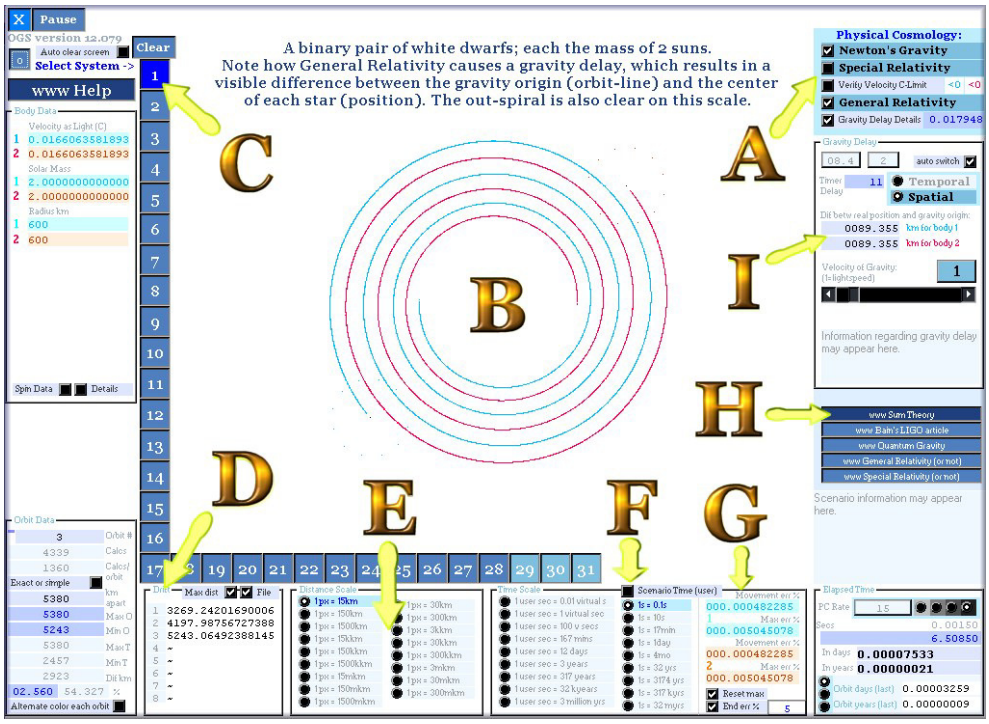
USING OGS12:

Understanding margin of error.

Most of the features in the OGS12 algorithm (orbit-gravity-sim-12.exe) can be understood by running the program then simply holding the mouse-pointer over various buttons, numbers, or features. A 'tool-tip' will then pop-up offering a more detailed explanation as to what that feature actually is.

Using OGS12 optimally requires firstly an appreciation as to how the software allows the user the most amount of flexibility to alter parameters. The user can thus inadvertently generate much larger margins-of-error than intended. Only by reading the full article will the user appreciate all the functions that can be utilized. But I will outline some of the main features using this screenshot image[ξ]:



A. Physical Cosmology – The most interesting feature is that the user can turn Special Relativity and General Relativity on and off even when a scenario is in mid-process.
B. The lines that the orbit follows will evolve in the centre of the screen. The orbit-line of the body may not coincide with the centre of the body in order to demonstrate the

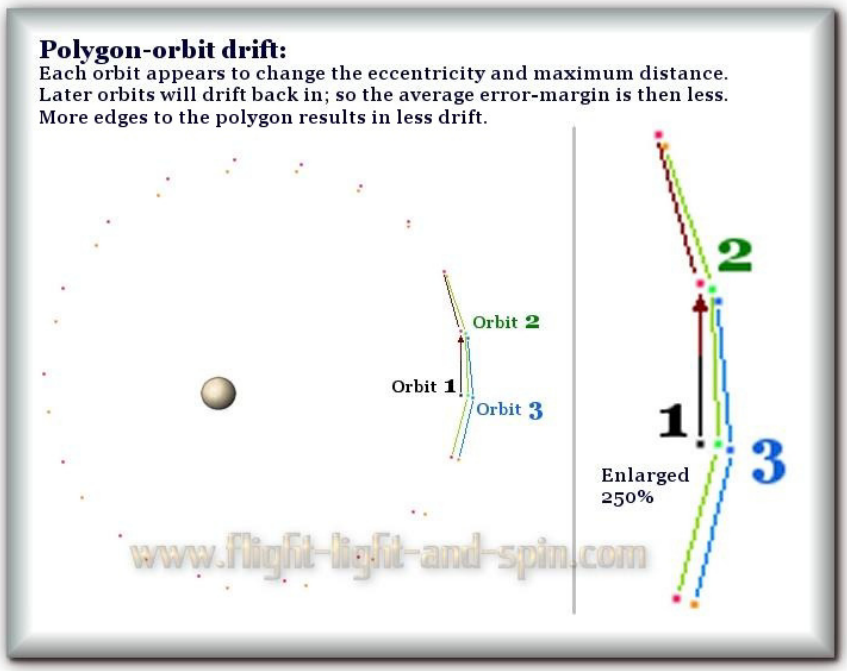
ξ Colors have been inverted to save ink.

gravity time-delay – if the option is selected whereby gravity travels at velocity (General Relativity). The dots around the centre of the body represent the circumference of the body.

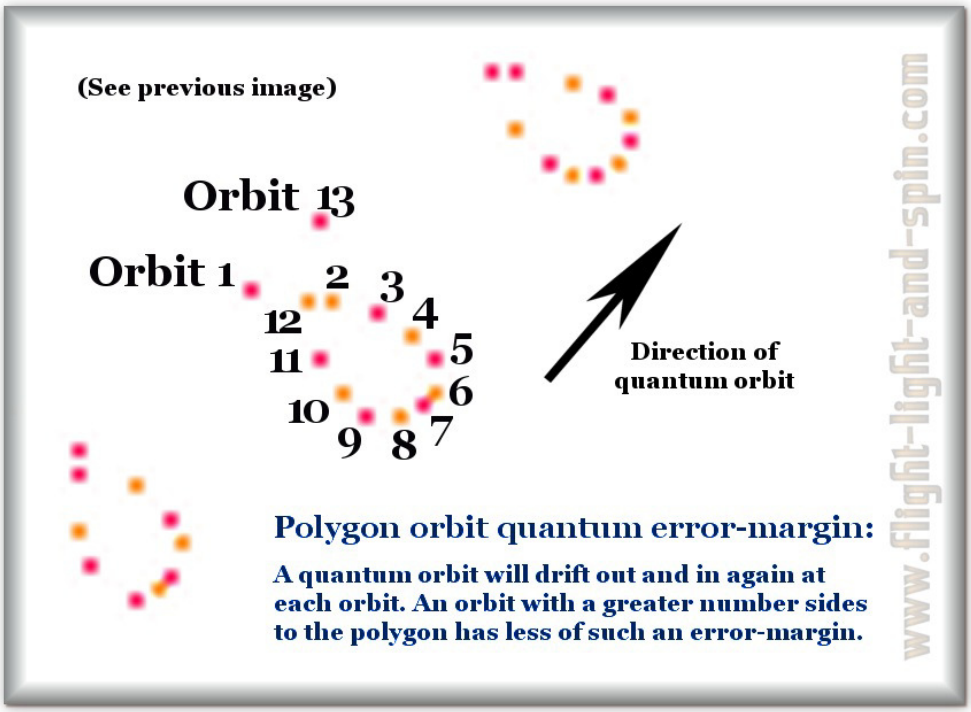
C. Click the numbers to begin each of the scenarios.
D. 'Drift' is the distance between the pair at maximum (or minimum) for first 8 orbits. Subsequent orbits will be found in a text file: 'drift-data.txt' which gets saved in the folder the software operates in, on your computer.
E. Distance-scale will expand if the bodies move off the screen.
F. Time-scale can be speeded up, or it can be slowed for better accuracy. Note the option 'Scenario Time' will use the preset time-scales for each scenario. If clicked, this then changes to 'User override' which will impose the user's choice of Time-scale when each scenario is started.
G. Movement error% will alter depending on the number of calculations per orbit which is a result of the Time-scale (F). Speeding up the process causes a larger margin-of-error.
H. These buttons link to the various full-length online articles describing the results and details of this analysis.
I. Gravity-delay is the distance between the gravity-origin and the body's position when gravity travels at velocity. Instant gravity will have no such delay. The time that gravity takes to cross the space between the pair is displayed next to the option 'gravity delay details'.

Most vital to understanding how quantum gravity works is to appreciate the difference between purely Newtonian orbits (as they are conceptualized using calculus) – and how they are computed in an evolutionary algorithm. The previous chapter on 'Zeno and Planck' is essential to this understanding. Simply put, quantum theory has time moving in distinct quantum jumps because otherwise we end up in Zeno's paradox which is fundamentally that if we can divide time into infinitely small units we end up with a division by zero error.

But when we compute our quantum-orbits, we do not have computers than can operate anywhere near Planck-time which divides time into units impossibly small. Thus the algorithm causes an error-margin which is proportional to the number of steps in the orbit. This error-margin is demonstrated most easily with the following graphic which evolved in an algorithm which has deliberately large jumps in order to exaggerate the error so that it is easier to observe, understand, explain and demonstrate.



The less the number of sides in a polygon-orbit the larger such deviations as depicted above will be. Interestingly the error-margin eventually laps back so that after many orbits the furthest point eventually loops back to where it started.



I tried to explain how this occurs in the section on Mars' orbit earlier. The polygon-orbit not only fluctuates its eccentricity but the aphelion and perihelion themselves also shift position by advancing on previous orbits. By increasing the number of iterations (quantum jumps) in each orbit, this error-phenomenon diminishes to a point far smaller than the Relativistic adjustments. Fully appreciating such fine detail is essential to ensuring that the process has been rigorously examined.

Do not be afraid to put this algorithm through its paces. It has been programmed with Microsoft's most robust programming suite, and if you find any bugs, or if you have any suggestions, I would be glad to hear from you no matter how advanced or tentative you consider your speculations on the matter to be.

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ANNOTATION:

Psychology is a priori to physics

The real revelation here is not that Relativity has been almost completely disproved. The shock is that one can spell out the details, step by painful logical step – patiently spoon-feeding the doubters these precise details. And yet almost everybody finds it easy to accept that corporate academia is correct despite being blatantly illogical. For the majority of people, the sheer weight of popular opinion is preferable than just plain logic. The fear of being unpopular is more powerful over the minds of almost everybody than reason is. And that is the essence of Democracy. Or as some call it: Demonocracy.

How many know that Relativity is actually wrong, but are just too feeble to acknowledge it publicly? How many are just incapable of recognizing what logic actually is? How many mindlessly repeat the premises of Relativity like a medieval religious mantra? These are profound questions of ethics, psychology and politics more deeply troubling than any aspect of Astrophysics or science. Because it is such spinelessness and ignorance that is at the core of what enables the likes of nazi Germany, fascist Italy and apartheid-affirmative-action South Africa to possess the very Soul of society and turn people into a mindless mob.

How so, you may ask? How can bad Cosmology and Science make people evil? There is a monumental quote from the movie 'Sin City – A Dame to Kill For' that goes like this: "Once you got everybody agreeing with what they know in their hearts ain't true, you got 'em by the balls." As crude as that is, I cannot find a better expression for the process at the core of brainwashing. Mob-instinct is fuelled by sub-conscious fear of the unknown.

It is no coincidence that the same person who is writing this thesis was also at the very crux of a deeply personal battle against the apartheid government. My actions in February of 1990 were that of a single isolated radical prepared to take that battle to the most extreme state of war without worry about the consequences to my physical person. I had no fear of their murderous threats. How easy by comparison to that war, it is now to simply disprove Einstein.

When, in turn, I made my own metered intimidation to the apartheid military, I was little more than an unarmed child without any weapons save my wit. I had little fear as they tried to coerce me under threat of murder or worse to join their evil mob. They had no real idea how isolated I was. Yes, I did threaten to wipe the entire Afrikaner race off the face of the Earth or die trying. Yet the only thing I was genuinely afraid of was simply being in the wrong. I was not wrong.

Three days after I declared my own blood-thirsty intent, it was announced that the ANC was to be un-banned, that Mandela was to be freed. As I watched De Klerk make that announcement on the television in the mental asylum that I had been briefly incarcerated in, I suddenly became free of *all* fear. I laughed so purely then. How I laugh now at the pathetic replies to my internet articles. How it amuses me to read the morass of frail fearful emotive responses to pure logic. How I remember the numerous other occasions that I stood in the space of Truth whilst most others simply wilted around me. How easily they capitulated to their own fears rather than simply standing up for what is True – regardless of peer-pressure-review.

It is just not feasible for me to examine every detail of all the sciences. And yet in the light of this analysis it is clear that as a method, science barely exists any longer. It has degenerated into a bureaucratic pyramid-scheme. There are numerous other instances where I have not had time to point out the many failings in populist scholastic reckoning. So I am hoping that this narrative will serve as a blueprint of method for others to use in the many other suspicious organizations involved in subjects such as materialist biology, medicine, genetics, biochemistry, law, politics, neuroscience, pharmacology, psychiatry and psychology to name but only a few.

After all, Astrophysics has always been the first example as a model for the scientific method. It takes this position because of its simplicity when compared to other areas of study. And seeing as it is utterly clear that Astrophysics has been so badly misunderstood; then the prima facie case against most other subjects is colossal.

'Science of the Gaps' is actually the dominant narrative underpinning so many forms of intellectual corruption. If it is not absolutely clear what any particular process entails after a concerted effort, then it is most likely pseudo-science and fraud. How easy it is for fraud to conceal itself within misunderstanding of theory; which is itself hiding behind the doubts of the scholar as to his own capacity.

To honestly say 'I do not understand' is the first step in pointing out that a given theory is not understandable because it is actually wrong. This is where writing one's own computer algorithm forces one to think in proper logical terms in such a way that pencil-and-paper by-rote memorization simply cannot do. Until you have successfully deployed a software algorithm of a million precisely placed characters, you have no real proven logical ability.

A prime example of mindless repetition of pseudo-science is the war-on-drugs which is a Luddite atrocity on the same sordid scale as apartheid and the holocaust. Underpinning that racist legal-medical corruption is the same process of belligerent intimidation that all

autocratic organizations follow. Relativity is just a prime example of how ignorance has taken the guise of reason, and how gullibility is more the norm than integrity is. It has always been thus, and perhaps it always will be so. But if you are not willing to die or worse for the sake of Truth, then you will be coerced into *corporuption*.

Has God graced I? Or is it just that I have chosen Truth before all other ideals? Perhaps, in February of 1990 I was less isolated than it appeared? Who can tell? But it matters not how many were on my side, because all that matters is: what is right, and what is wrong; and what is courage and what is cowardice.

It matters not how long it takes, neither how many are against you, nor how they can only reply with *ad hominem* arguments, 'appeals to Authority', groupthink, and outright garbled sophistry. Because all atrocious regimes eventually collapse under the weight of their own lies and fears, regardless of how real or imagined those fears actually are. And that is the essence of faith.

There is a distinct possibility that I may never go beyond the astrophysics in this chapter, although I dearly hope to do so. As I write this, South Africa is degenerating into civil war as affirmative action does its utmost to replicate all the myopic racist fascism of apartheid. Sometimes, unfortunately, more mundane problems just become a greater priority than the beautiful mysteries of the wider Universe. And balancing such duality is at the core of any authentic philosophy.