The Nature of Gravity

A New Steady State Theory [1]

Published February 10, 2022

by

Robert A Beatty BE (Minerals) FAusIMM
BobBeatty@bosmin.com

PRINCIPIA SCIENTIFIC International

The Nature Of Gravity

A New Steady State Theory [1]
Last edit: 10 February 2022
Robert A. Beatty BE (Minerals) FAusIMM
BobBeatty@bosmin.com

Abstract:
This paper proposes a new form of Steady State for the universe involving a periodic rotation of mass, to energy as gravity fields, and back to mass again. It explores the Big Bang theory and exposes several serious flaws, while suggesting alternate explanations. A theory is presented into the operation and function of black holes, with an explanation for red shifted stars, and dark matter.

Keywords:
Einstein, Newton, Shapiro, Jeremy Deaton, Andrea Ghez, Star SO-2, Big Bang, Steady State, graviton, positron, negatron, Monoceros, V616, tensor boson, entangled particle, dark matter, spiral galaxy, Messier 33, ephemeral mass, radiation pressure

1) Introduction:

Gravity is all pervading throughout our universe, but not fully understood. Albert Einstein and Isaac Newton both gave the subject considerable attention which included some famous statements:
“Einstein argued that gravity isn't a force at all. He described it as a curvature of time and space caused by mass and energy,” and entanglement as “spooky action at a distance”.[2]

Newton’s remarks on gravity include: “Gravity explains the motions of the planets, but it cannot explain who sets the planets in motion.” “Truth is ever to be found in the simplicity, and not in the multiplicity and confusion of things.” “No great discovery was ever made without a bold guess.”

Newton Medal winner (2012): Prof. Martin Rees.[3]
“The Isaac Newton theory of gravity predicts that the gravitational force on any object is proportional to its mass, while his second law of motion predicts that the resulting acceleration is inversely proportional to the object's mass.”
“Legend has it that Isaac Newton came up with gravitational theory in 1665, or 1666, after watching an apple fall. ... He showed that the force that makes the apple fall and that holds us on the ground is the same as the force that keeps the moon and planets in their orbits.”
Einstein vs Newton video discussion [4]

A phenomenon known as an "Einstein Ring" is created when light is bent by gravity around a large object. In this case, the large red galaxy in the middle is causing light from a much more distant blue galaxy directly behind it to be bent around into the shape of a ring. (Credit: ESA/Hubble/NASA)[5]

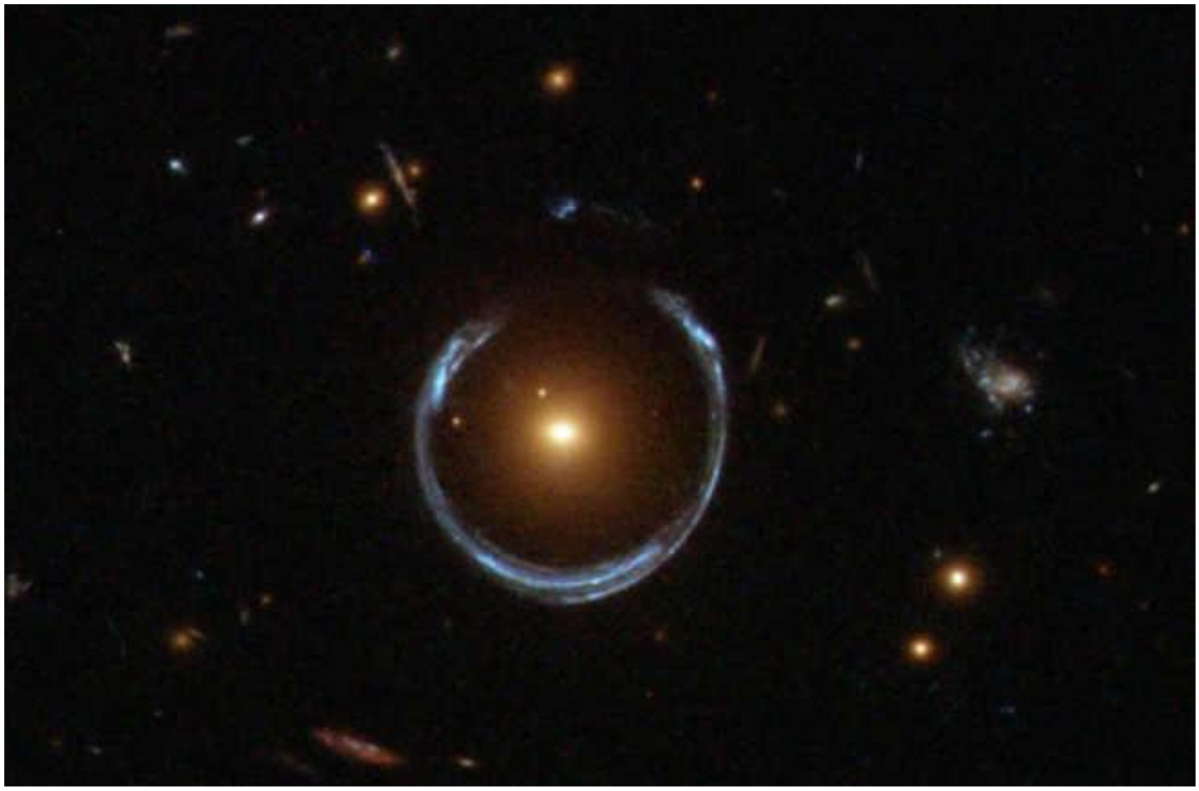

Figure 1.
‘Einstein theorized that a mass can prod space plenty. It can warp it, bend it, push it, or pull it. Gravity was just a natural outcome of a mass's existence in space.’

Jeremy Deaton, MD Yale Environment 360.[6]
“Albert Einstein can explain a lot, but maybe not black holes. Scientists believe that within the inky depths of these massive celestial objects, the laws of the universe fold in on themselves, and the elegant model of gravity laid out in Einstein’s general theory of relativity breaks down.”

Stuart Wolpert, Senior Media Rep. UCLA Life Sciences. July 25, 2019 [7]
“More than 100 years after Albert Einstein published his iconic general theory of relativity, it is beginning to fray at the edges, said Andrea Ghez, UCLA professor of physics and astronomy. Now, in the most comprehensive test of general relativity near the monstrous black hole at the center of our galaxy, Ghez and her research team report July 25 in the journal Science that Einstein’s theory holds up.”

“Einstein’s right, at least for now,” said Ghez, a co-lead author of the research “We can absolutely rule out Newton’s law of gravity. Our observations are consistent with Einstein’s general theory of relativity. However, his theory is definitely showing vulnerability. It cannot fully explain gravity inside a black hole, and at some point we will need to move beyond Einstein’s theory to a more comprehensive theory of gravity that explains what a black hole is.”

Einstein’s 1915 general theory of relativity holds that what we perceive as the force of gravity arises from the curvature of space and time. The scientist proposed that objects such as the sun and the Earth change this geometry. Einstein’s theory is the best description of how gravity works, said Ghez, whose UCLA-led team of astronomers has made direct measurements of the phenomenon near a supermassive black hole — research Ghez describes

as “extreme astrophysics.”.[8]

The star SO-2 obits the Milky Way black hole at the centre of our galaxy, and its light turns from blue to red light as it passes the highest gravity zone near to the black hole.

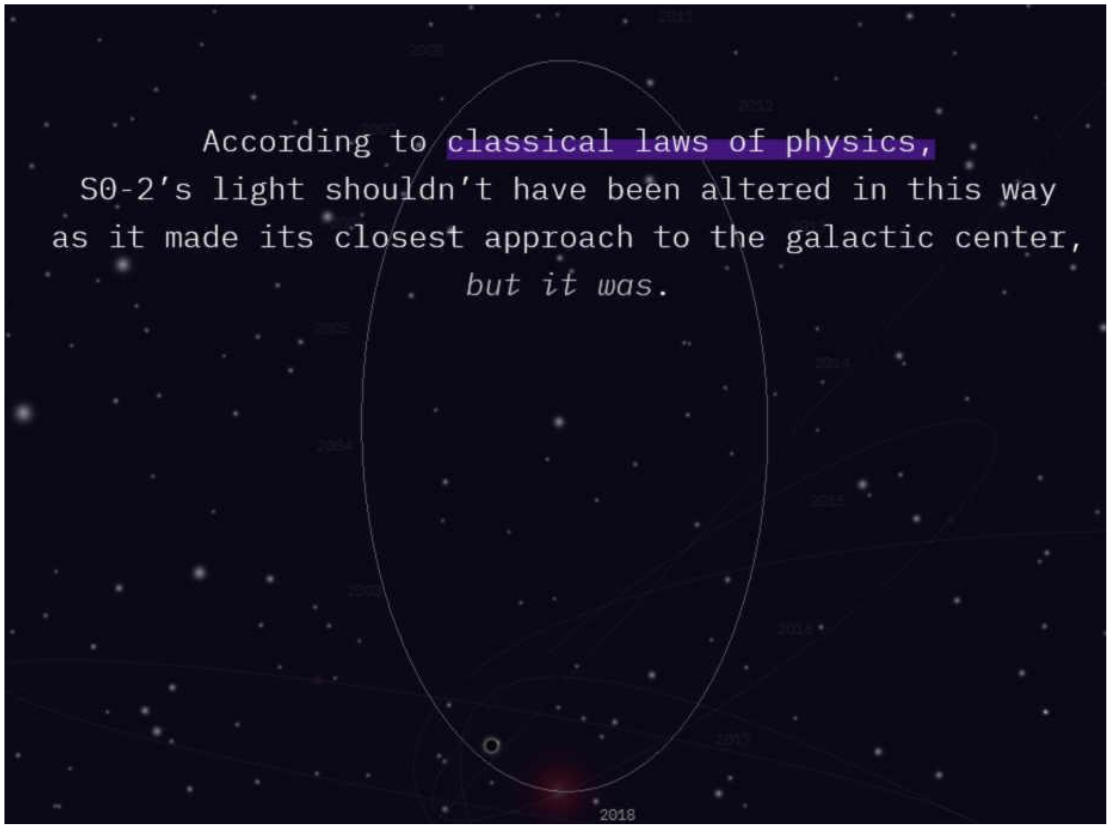

Figure 2.
This evidence undermines the main Big Bang proposal that a red shifted spectrum is due to the Doppler Effect, but is silent on a stronger gravity field explanation.

Interim Conclusions:

1. Both Einstein and Newton were right to the extent that their areas of research covered.
2. Newton is substantially correct when his work is restricted to the Solar System.
3. Einstein is correct in wider areas of the universe, and crucially identified time dilation.
4. Newton correctly identified a gravity constant, without suggesting it could be a vector variable operating beyond the solar system.
5. Neither Einstein or Newton correctly identified the variable nature of regional gravity, the importance of Black Holes, or mass recycling.

2) Applicable Sciences:

2.1 "Weak" Gravity Force.

Four forces govern the universe, in ascending order, are gravitational, weak nuclear, electromagnetic, and strong nuclear, as depicted at: [9]

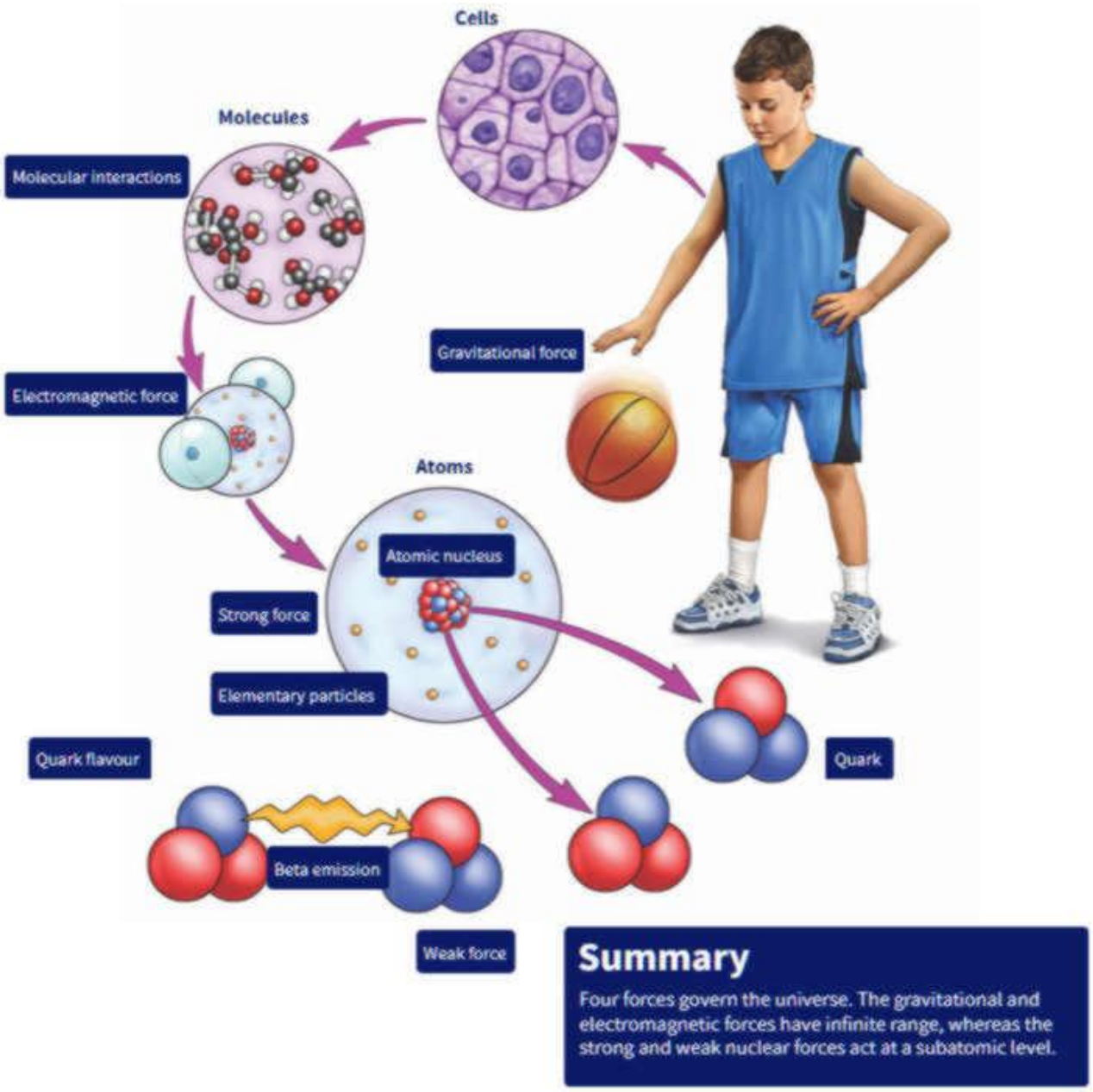

Figure 3.

Gravity is often described as a weak force, and is one of the four fundamental force particles as tabulated: [10]

Fundamental Force Particles

Force	Particles Experiencing	Force Carrier Particle	Range	Relative Strength*
Gravity acts between objects with mass	all particles with mass	graviton (not yet observed)	infinity	much weaker
Weak Force governs particle decay	quarks and leptons	W^+, W^-, Z^0 (W and Z)	short range	
Electromagnetism acts between electrically charged particles	electrically charged	γ (photon)	infinity	
Strong Force** binds quarks together	quarks and gluons	g (gluon)	short range	much stronger

Figure 4.

This statement can be regarded as an over simplification of the situation operating elsewhere in the universe. There are many comments which show gravity can be an overwhelmingly strong force near black holes, neutron stars, white dwarfs, etc.[11]

“A black hole is a place in space where gravity pulls so much that even light can not get out. The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying. An artist's drawing of a black hole named Cygnus X-1 shows it formed when a large star caved in. This black hole pulls matter from the blue star beside it. Credits: NASA/CXC/M.Weiss”

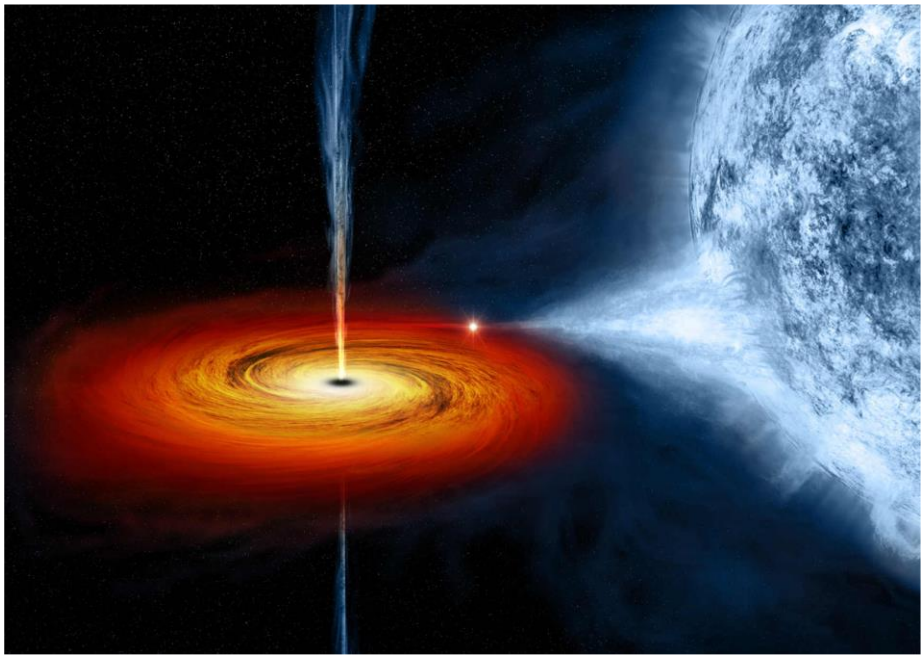

Figure 5.

A strong gravity field will weaken as distance increases following the Inverse Square law: [12]

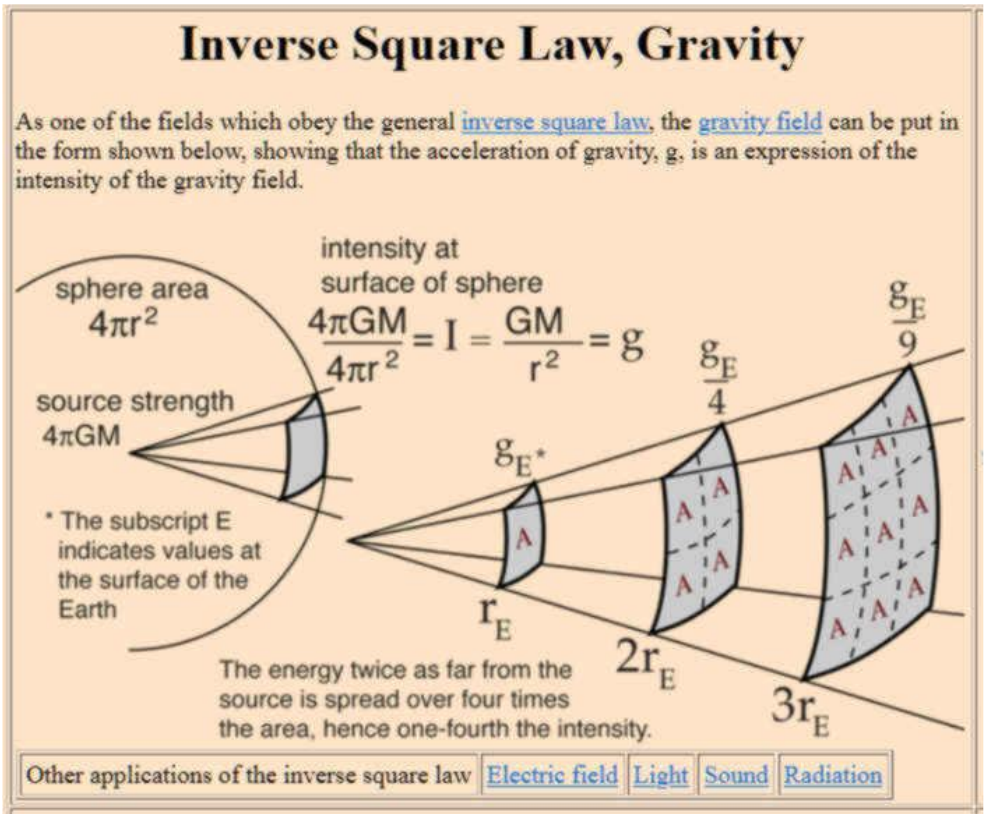

Figure 6.

Interim Conclusion:

We can deduce that a weak gravity field will be associated with a large distance from a source of gravity where the gravity field (G) is numerically larger.

3) Black Holes.

3.1 The nature of Black Holes.

Current thinking on the nature of black holes is usefully summarised:[13]
"The term 'black hole' is one used by space scientists to describe places in space where the force of gravity is so great that all matter in a region is squeezed into tiny spaces, to the extent that even light cannot travel! Black holes are often regarded as regions in space where virtually nothing can escape. Amidst the myths and mysteries that abound on the subject of black holes, you would find the following 25+ carefully compiled facts about black holes enlightening and intriguing."

This common view fails to describe how gravity gets so strong, and why it has a physical effect on light which is regarded as massless, and thus should be unaffected by gravity.

My paper on black holes is available at,[14] and includes this summary diagram that proposes a black hole is a location where gravity is strongest through the formation of gravitons.

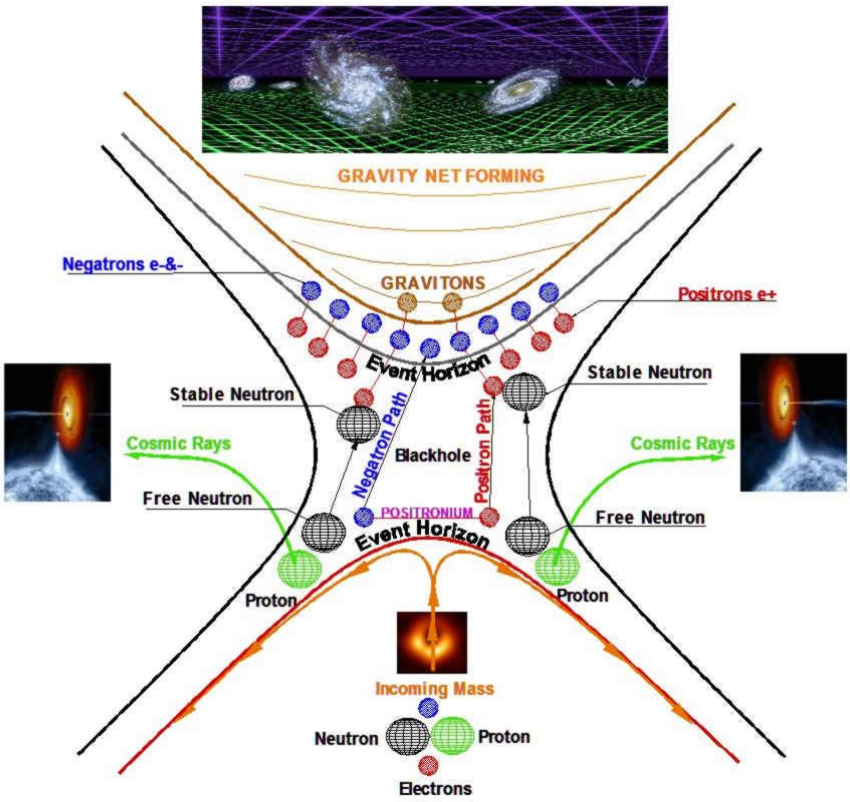

Figure 7.
The graviton field at a black hole is sufficiently concentrated for the Gravitational force to overcome the Strong force. This affect is sufficiently powerful to eliminate time from the incoming mass, as evidenced by its atomic separation.

3.2 Black hole formation of gravity fields.

The Negatrons paper proposes that electrons can exist as positrons and negatrons. The negatrons convert to gravitons during their exit from a black hole. This transition occurs when the positron remains inside the black hole providing a positive charge which stabilises the free neutron, by converting it back to a neutron. However, the graviton remains entangled with its positron partner establishing a gravity field.

The Negatron paper calculates how far a black hole is from the solar system to provide the strength of gravity field we experience. This shows the black hole is 3,343 light years distant, which is also the distance to the largest black hole in our region of the solar system, V616 in the Monoceros constellation.

This is shown and described as a gravisphere:[15]

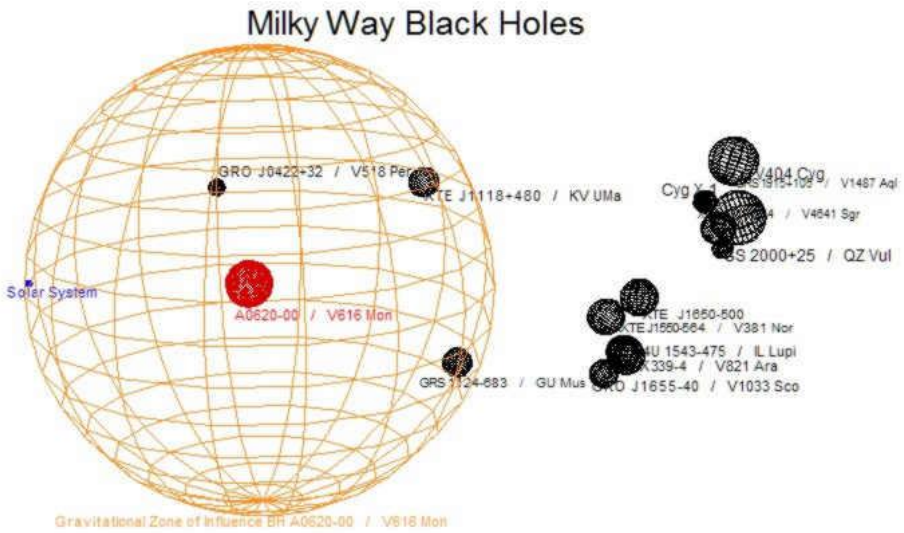

Figure 8.
The relationship between distance and gravity as well as time is summarised in the following graph.

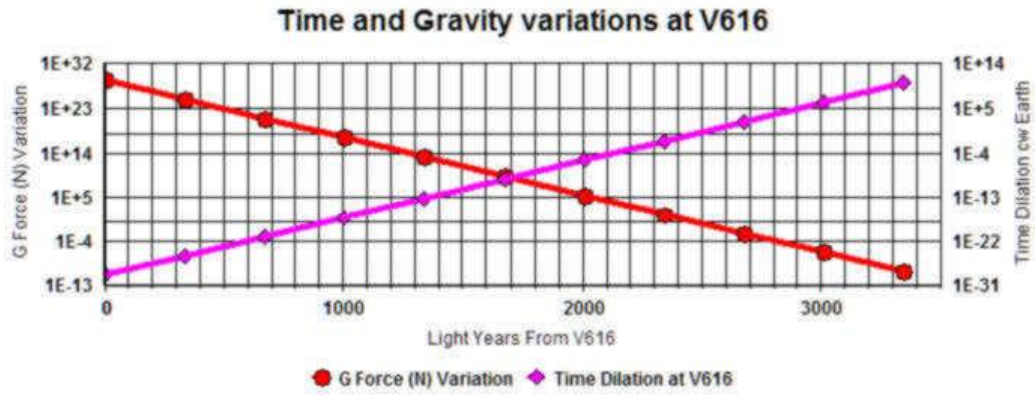

Figure 9.

3.3 General Relativity and Quantum mechanics.[16]

"In theories of quantum gravity, the graviton is the hypothetical quantum of gravity, an elementary particle that mediates the force of gravitational interaction. There is no complete quantum field theory of gravitons due to an outstanding mathematical problem with renormalization in general relativity. In string theory, believed to be a consistent theory of quantum gravity, the graviton is a massless state of a fundamental string."

The Negatron paper previously referred to, proposes a modified Standard Model of Elementary Particle to accommodate the Graviton particle as a tensor boson.

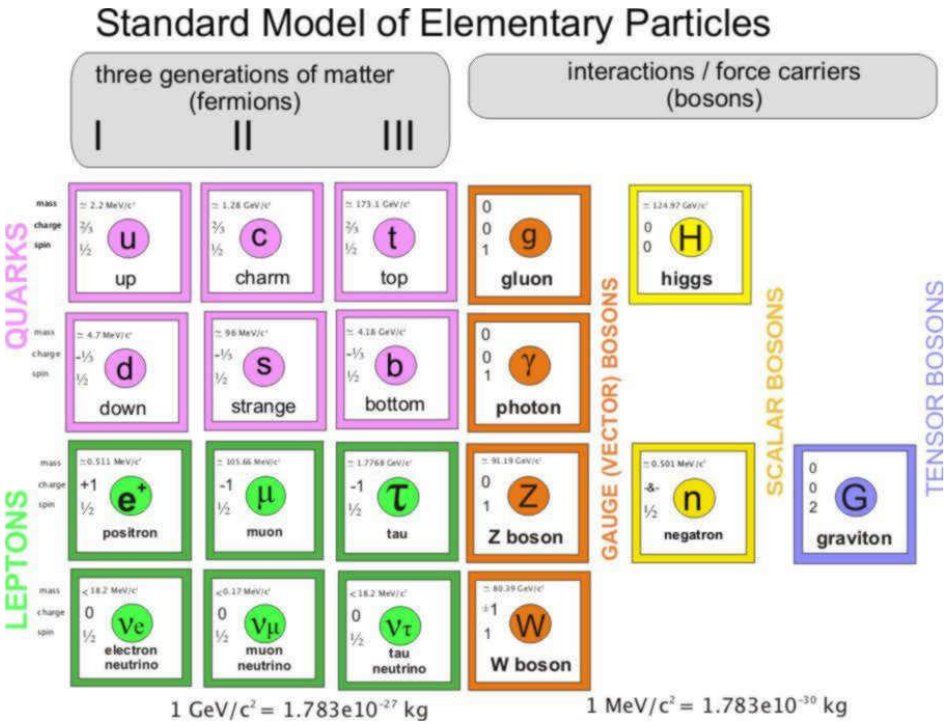

Figure 10.

3.4 Transmission and accumulation of gravity.

Gravity is a field structure and therefore has no velocity. However it does accumulate on mass objects in proportion to their size. This is illustrated in the following graphic: [17]

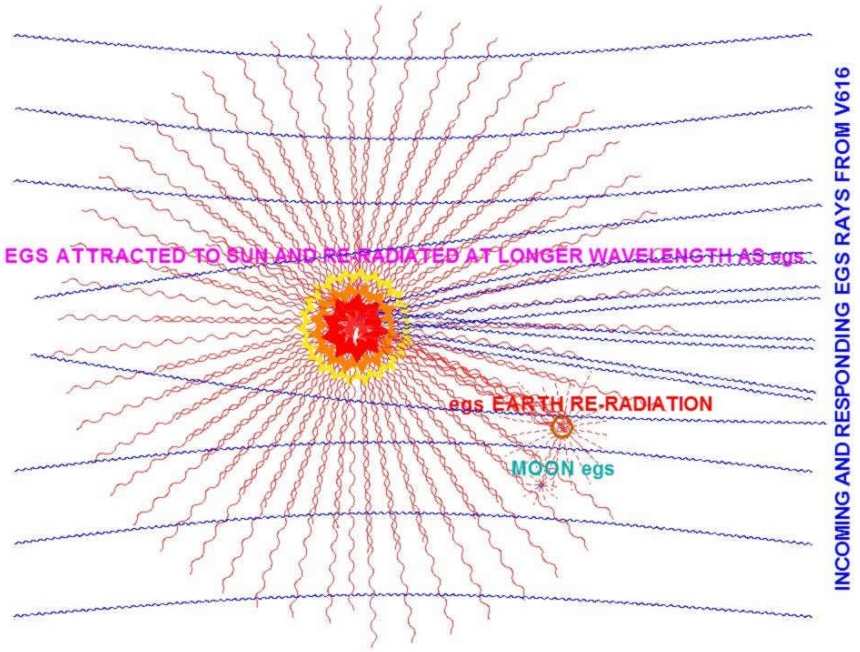

Figure 11.

The black hole gravity field is primarily attracted to the largest sun mass in the solar system. Secondary, gravity fields attach minor orbiting masses to the central sun. In this illustration the different entangled particles are noted as EGS and egs.

Interim Conclusions:

The new Steady State theory concludes that Black holes appear to be a critical, but poorly understood component for the universe.

Black holes may be the source of gravitons which in turn generate gravity fields that form numerous gravispheres throughout the universe.
Gravity fields transfer energy across the universe and restrains orbiting objects within their orbits.

4) Spiral arm anomaly.
The concept of 'dark matter' was introduced to account for an anomaly detected at spiral galaxies. Dark matter proposes that the universe is beset with matter which is not immediately visible, but which provides significant gravitational attraction to constrain the stars to cluster in the spiral arms of some galaxies. The conundrum arose because the spiral arms were operating like bicycle spokes, rather than orbiting planets, as discussed in:[18]

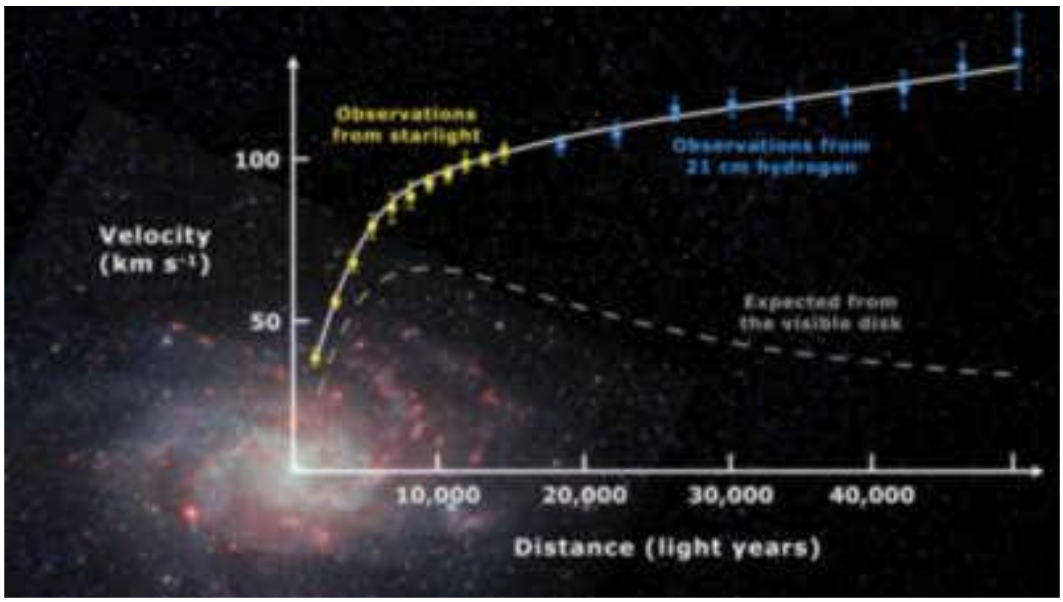

Figure 12.
"Rotation curve of spiral galaxy Messier 33 (yellow and blue points with error bars), and a predicted one from distribution of the visible matter (gray line). The discrepancy between the two curves can be accounted for by adding a dark matter halo surrounding the galaxy."

If stars are sited within a gravisphere structure, they can gravitationally attract between the gravispheres, forming a chain association. In this way they can stick together without the need to introduce the dark matter concept. However, the space between the spiral arms is expected to be regions of low gravity with a background hydrogen population not associated with the gravispheres.

Interim Conclusions:
1. Stars sited within the confines of gravispheres may gravitationally group together in a form appearing in spiral arm galaxies.
2. Gravispheres associated through gravity will not follow the Kepler Laws of planetary motion.

5) Speed of light limitation.[19]
"The speed of light in vacuum, commonly denoted c, is a universal physical constant that is important in many areas of physics. Its exact value is defined as 299792458 metres per second (approximately 300000 km/s or 186000 mi/s). – According to special relativity, c is the upper limit for the speed at which conventional matter, energy or any signal carrying

information can travel through space.– All forms of electromagnetic radiation travel at the speed of light, not just visible light. Massless particles and field perturbations such as gravitational waves also travel at this speed in vacuum. In the special and general theories of relativity, c interrelates space and time, and also appears in the famous equation of mass–energy equivalence, $E=mc^2$."

"The Shapiro time delay effect,[20] or gravitational time delay effect, is one of the four classic solar-system tests of general relativity. Radar signals passing near a massive object take slightly longer to travel to a target and longer to return than they would if the mass of the object were not present. The time delay is caused by spacetime dilation, which increases the time it takes light to travel a given distance from the perspective of an outside observer. In a 1964 article entitled Fourth Test of General Relativity, astrophysicist Irwin Shapiro wrote: Because, according to the general theory, the speed of a light wave depends on the strength of the gravitational potential along its path, these time delays should thereby be increased by almost 2×10−4 sec when the radar pulses pass near the sun. Such a change, equivalent to 60 km in distance, could now be measured over the required path length to within about 5 to 10% with presently obtainable equipment."

A critical statement in this article is 'The time delay is caused by spacetime dilation' which assumes our understanding, of how light travels, is correct.

My paper Photon Gravisphere Speeds[21] proposes that light operating as an electro magnetic wave transmission will require an ephemeral mass phase to transition between the two fields. This is illustrated in the paper:

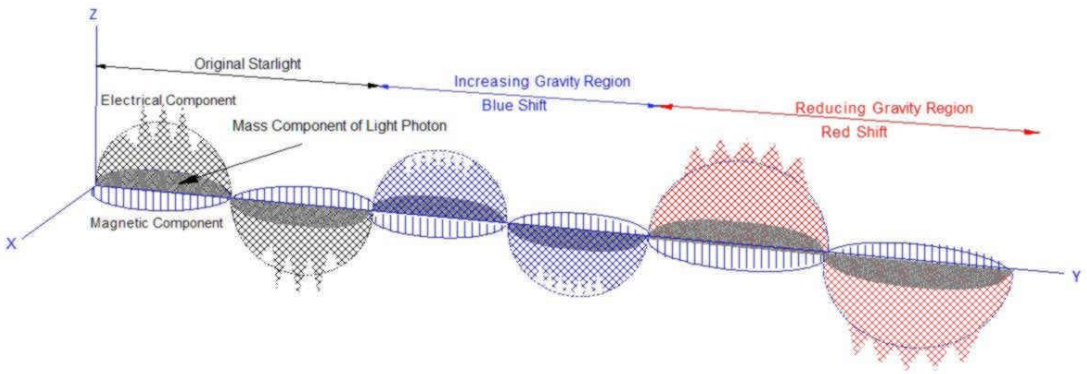

Figure 13.
It shows an ephemeral mass component to the light beam, which allows it to be affected by passing gravity fields. Further evidence of a mass component to light is deduced from the 'radiation pressure', 'force of light', or 'electromagnetic momentum' phenomenon reported at:[22]

This property of light causes the beam to slow when entering a field of increasing gravity, and to speed up when entering a field of reducing gravity. These effects appear as red and blue shifted light. However, the maximum possible speed is limited to c, as defined.

This effect simulated through a multitude of gravispheres will appear as blue and red light depending on the location of the gravisphere, as described in the Exposed Light report:

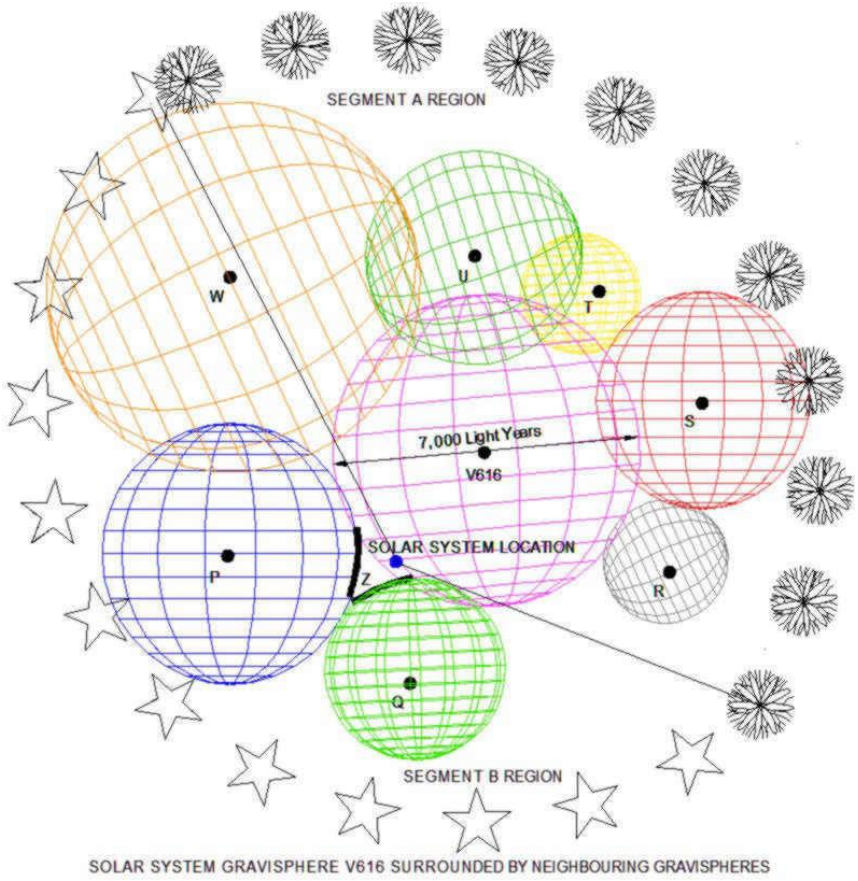

Figure 14.
This diagram shows a small region Z where blue starlight arrives at the solar system from a low gravity location. The majority of other starlight has travelled through one or more high gravity regions thereby slowing the light to report as red shifted on spectral analysis.

The further the light travels, the more likely it is to be slowed, so the more distant galaxies show greater red shifted light than the nearer stars. Expanding movement of the stars is not required to explain this light shift.

Interim Conclusions:

1. This new Steady State theory concludes that electromagnetic transmissions, such as star light, include an ephemeral mass state which makes light subject to gravity field influences.
2. Light entering higher gravity fields will result in light mass retardation, and resulting in a chromatic red shift.
3. Repeated transmission through gravity fields appears to have a cumulating affect on light speed and is consistent with distant stars showing extra red shift.
4. Light coming entering a lower gravity field will result in light mass acceleration, but limited to a maximum speed of c, and appearing as a chromatic blue shift.

6) LIGO Measurements.[23]

"The Laser Interferometer Gravitational-Wave Observatory (LIGO) is a large-scale physics experiment and observatory designed to detect cosmic gravitational waves."
"The Advanced LIGO Project to enhance the original LIGO detectors began in 2008 and continues to be supported by the NSF, with important contributions from the United Kingdom's Science and Technology Facilities Council, the Max Planck Society of Germany,

and the Australian Research Council. The improved detectors began operation in 2015. The detection of gravitational waves was reported in 2016."
"Observations are made in "runs". As of December 2019, LIGO has made 3 runs, and made 50 detections of gravitational waves. Maintenance and upgrades of the detectors are made between runs. The first run, O1, which ran from 12 September 2015 to 19 January 2016, made the first 3 detections, all black hole mergers. The second run, O2, which ran from 30 November 2016 to 25 August 2017, made 8 detections, 7 black hole mergers, and the first neutron star merger. The third run, O3, began on 1 April 2019; it is divided (so far) into O3a, from 1 April to 30 September 2019, and O3b, from 1 November 2019 until it was suspended in March 2020 due to COVID-19."

By December 2019 50 detections of gravitation waves were recorded, an average of 12.5 per year. It seems a high number if we are recording black hole assimilations.

Interim Conclusion:
The LIGO equipment may be recording more normal events than colliding black holes. These may involve a gravity wave surge associated with unusually large mass digestion occurring at our Gravisphere black hole, or at an adjacent Gravisphere.

7) Cosmological evidence for Big Bang.
Recent discussion supporting the Big Bang theory includes:[24]
"All science is based on evidence. So what is the evidence for the Big Bang?

1. Redshift of Galaxies
The light we observe from galaxies has been stretched by the time it reaches us. It looks redder than it should. This redshift is the result of galaxies moving away from us. Observations show that pretty much everything in the Universe is moving apart. The redshift of distant galaxies tells us the Universe is expanding.

If you could wind time backwards, you would see galaxies getting closer together. If you could go back far enough, everything in the Universe would have been in one place.

Figure 15a.
2. Microwave Background

A long, long time ago, the whole Universe was very hot. As it grew in size, the heat left a "glow" which fills the entire Universe. The Big Bang theory predicts this glow should still exist. It also predicts that we should be able to detect this glow as microwave light.

Scientist have found this Cosmic Microwave Background. They have accurately measured it using orbiting detectors. It is very good evidence that the Big Bang theory is correct.

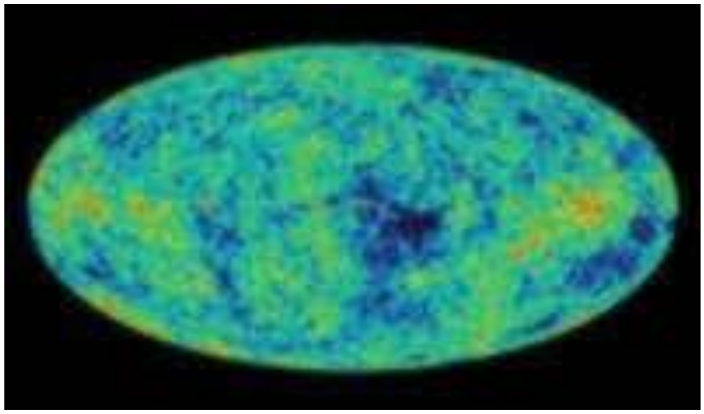

Figure 15b.

3. Mixture of Elements

Some chemical elements were created soon after the Big Bang. Elements like hydrogen and helium. The Big Bang theory predicts how much of each element was made in the early universe. When astronomers look at very old galaxies and stars, the amount of each chemical they see agrees with the Big Bang theory.

You cannot look for this evidence in new stars, like the Sun. This is because newer stars contain chemical elements made by older stars. So the chemical make-up of new stars is very different from stars which existed soon after the Big Bang.

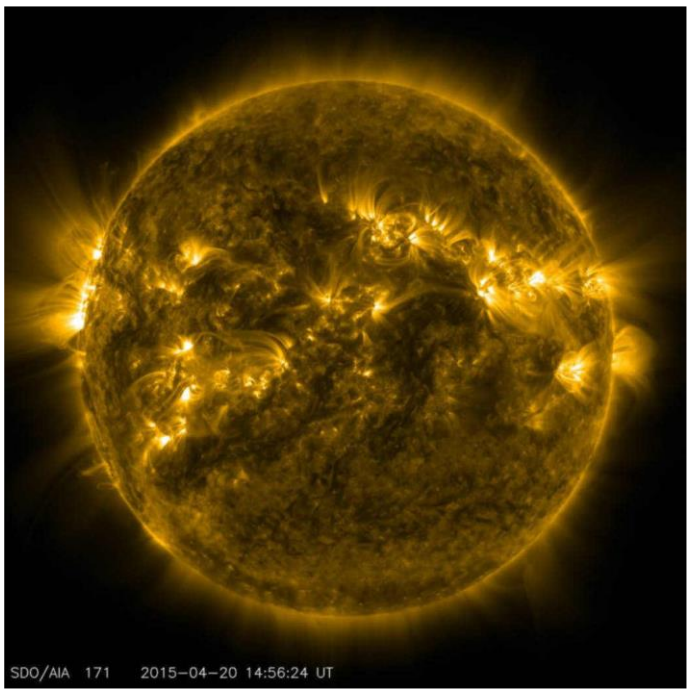

Figure 15c.

4. Looking back in time

There is an alternative to the Big Bang theory. It is called the Steady State theory. In this

theory, the Universe does not change much over time.

Remember - light takes a long time to travel across the Universe. So when we look at galaxies which are very far away, we are also looking back in time.

This means we can see that very old galaxies are very different from newer galaxies. This shows the Universe has changed. This evidence fits better with the Big Bang theory than the Steady State theory.
History of the Universe.[25]
The Universe began with the Big Bang about 14,000 million years ago (14,000,000,000 years). When it was young, the Universe was very, very hot and dense. Since then, it has been cooling down and getting bigger.

For the first tiny fraction of a second after the Big Bang, everything was too hot for us to describe what it was like. It was not like any physics we see or experience now. But we can use science to work out what happened from as little as 10-43 seconds - or 0.00000000000000000000000000000000000000000001 seconds! - after the Big Bang.
This theory is simulated in the exhibit:

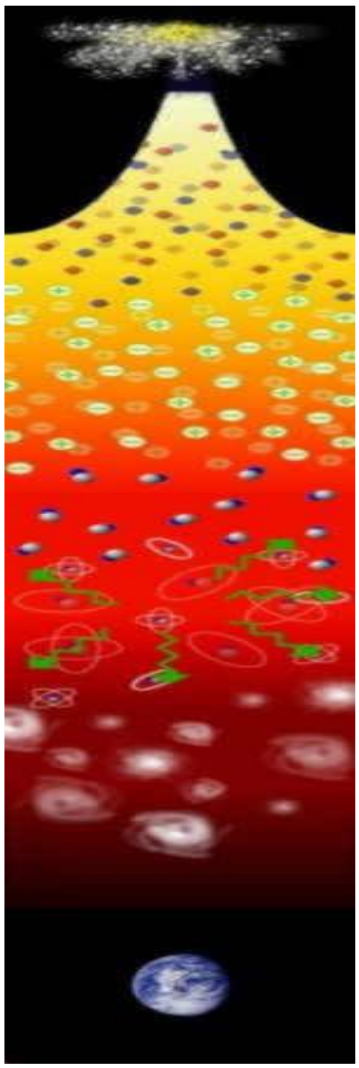

Figure 15d.

8) Cosmological evidence for Steady State.

The report "Big Bang or Steady State?"[26] outlines four concerns surrounding the Big Bang theory which include:

1. Galaxies are moving apart which conflicts with our understanding of gravitational attraction.
2. The start point involves elements of time, mass, and energy which are generally incomprehensible.
3. The concept of "Dark Matter" is inferred to explain astronomical sightings of visible matter, but remains a hypothetical construct.
4. Our understanding of gravity is quite deficient, yet gravity must represent a critical element for understanding any universe evolution theory.

We can enhance these comments by addressing the four paragraph headings from section 7:

1. Redshift of Galaxies

This point is rendered moot now it is shown that "Star SO-2 obits the Milky Way black hole at the centre of our galaxy and turns from blue to red light as it passes the highest gravity zone."

2. Microwave Background

as reported:[27]

"You can't see the CMB with your naked eye, but it is everywhere in the universe. It is invisible to humans because it is so cold, just 2.725 degrees above absolute zero (minus 459.67 degrees Fahrenheit, or minus 273.15 degrees Celsius.) This means its radiation is most visible in the microwave part of the electromagnetic spectrum."

This is not compelling evidence, but may record expected minute background temperature variations occurring across our universe.

3. Mixture of Elements

"Some chemical elements were created soon after the Big Bang. Elements like hydrogen and helium."

Both of these elements have a very simple atomic structure which seems likely to develop randomly throughout the universe rather than only at the dawn of time. Cosmic rays have been detected emanating from a black hole at M87. When these combine with electrons they can form into hydrogen and larger atoms.

4. Looking back in time

"This means we can see that very old galaxies are very different from newer galaxies. This shows the Universe has changed. This evidence fits better with the Big Bang theory than the Steady State theory."

Interim Conclusions:

1. Red Shifted galaxies as observed, appears to have explanations other than the Doppler effect following star SO2 observations. The Big Bang theory is fundamentally based on the red shift observation and the Big Bang theory must now be regarded as suspect.
2. The universe microwave findings do not categorically support the Big Bang theory, because the results do not show a recognisable wave pattern and could be regarded as normal minute temperate variations throughout the universe.
3. Both hydrogen and helium have very simple atomic structures which seems likely to develop randomly throughout the universe rather than only at the dawn of time.
4. Cosmic rays with a preponderous of protons have been detected emanating from black

holes. When these combine with electrons they can form into hydrogen and larger atoms.

5. Looking back in time is an ongoing astronomical challenge. Current observations support a form of Steady State universe rather than the Big Bang theory.

9) Proposed New Steady State Theory.

The original Steady State theory imagined an isotropic universe with homogeneous appearance in every direction. It now appears there is room for a theory which acknowledges the universe is not homogeneous, but cycles through stages of mass, energy as gravity and back to mass again. This is discussed at[28] and includes the exhibit:

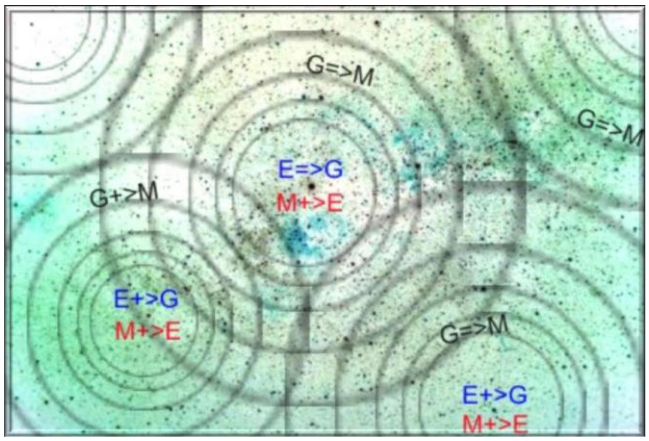

Figure 16.

The transfer from mass to gravity occurs at black holes, while the transfer from gravity to mass is seen recorded on Earth as the expanding earth theory and illustrated in the Mid Atlantic Ridge (MAR) expansion.[29]

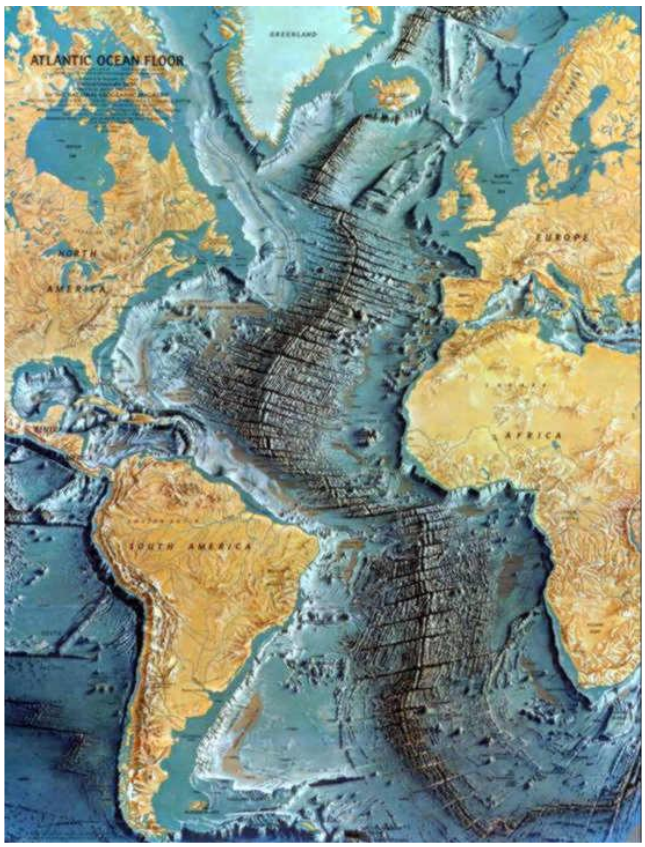

Figure 17.

Interim Conclusion:

The modified Steady State proposal accommodates geological subductions as well as earth expansion with the net effect being a periodic expansion of the earth's mass, as evidenced by the parallel ridge structures along the MAR fracture.

10) Gravity and Time Definitions.

These proposals lead to new definitions for gravity and time:

Gravity. "Gravity is a visceral property of mass endowed through it's entangled association with a black hole."

Time. "Time is a property of mass dependant on its viscous association with gravity."

11) Conclusions:

1. Both Einstein and Newton were right to the extent that their areas of research covered.
2. Newton is substantially correct when his work is restricted to the Solar System.
3. Einstein is correct in wider areas of the universe, and crucially identified time dilation.
4. Newton correctly identified a gravity constant, without suggesting it could be a vector variable operating beyond the solar system.
5. Neither Einstein or Newton correctly identified the variable nature of regional gravity, the importance of Black Holes, or mass recycling.
6. We can deduce that a weak gravity field will be associated with a large distance from a source of gravity where the gravity field (G) is numerically larger.
7. The new Steady State theory concludes that Black holes appear to be a critical, but poorly understood component for the universe.
8. Black holes may be the source of gravitons which in turn generate gravity fields that form numerous gravispheres throughout the universe.
9. Gravity fields transfer energy across the universe and restrains orbiting objects within their orbits.
10. Stars sited within the confines of gravispheres may gravitationally group together in a form appearing in spiral arm galaxies.
11. Gravispheres associated through gravity will not follow the Kepler Laws of planetary motion.
12. This new Steady State theory concludes that electromagnetic transmissions, such as star light, include an ephemeral mass state which makes light subject to gravity field influences.
13. Light entering higher gravity fields will result in light mass retardation, and resulting in a chromatic red shift.
14. Repeated transmission through gravity fields appears to have a cumulating affect on light speed and is consistent with distant stars showing extra red shift.
15. Light coming entering a lower gravity field will result in light mass acceleration, but limited to a maximum speed of c, and appearing as a chromatic blue shift.
16. The LIGO equipment may be recording more normal events than colliding black holes. These may involve a gravity wave surge associated with unusually large mass digestion occurring at our Gravisphere black hole, or at an adjacent Gravisphere.
17. Red Shifted galaxies as observed, appears to have explanations other than the Doppler effect following star SO2 observations. The Big Bang theory is fundamentally based on the red shift observation and the Big Bang theory must now be regarded as suspect.
18. The universe microwave findings do not categorically support the Big Bang theory, because the results do not show a recognisable wave pattern and could be regarded as

normal minute temperate variations throughout the universe.

19. Both hydrogen and helium have very simple atomic structures which seems likely to develop randomly throughout the universe rather than only at the dawn of time.
20. Cosmic rays with a preponderous of protons have been detected emanating from black holes. When these combine with electrons they can form into hydrogen and larger atoms.
21. Looking back in time is an ongoing astronomical challenge. Current observations support a form of Steady State universe rather than the Big Bang theory.
22. The modified Steady State proposal accommodates geological subductions as well as earth expansion with the net effect being a periodic expansion of the earth's mass, as evidenced by the parallel ridge structures along the MAR fracture.
23. New definition. "Gravity is a visceral property of mass endowed through it's entangled association with a black hole."
24. New definition. "Time is a property of mass dependant on its viscous association with gravity."

12) References.

1. https://www.bosmin.com/PSL/NatureOfGravity.pdf
2. https://www.economist.com/the-economist-explains/2017/03/16/what-is-spooky-action-at-a-distance
3. https://en.wikipedia.org/wiki/Martin_Rees
4. https://www.youtube.com/watch?v=4IxuXuLbMoQ
5. https://www.discovermagazine.com/the-sciences/how-to-understand-einsteins-theory-of-gravity
6. https://www.nbcnews.com/mach/science/einstein-showed-newton-was-wrong-about-gravity-now-scientists-are-ncna1038671
7. https://newsroom.ucla.edu/releases/einstein-general-relativity-theory-questioned-ghez
8. https://relativity.astro.ucla.edu/
9. https://www.space.com/four-fundamental-forces.html
10. https://www.pbs.org/wgbh/nova/teachers/activities/3012_elegant_02.html
11. https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-a-black-hole-k4.html
12. http://hyperphysics.phy-astr.gsu.edu/hbase/Forces/isq.html
13. https://eartheclipse.com/space/black-holes-facts.html
14. http://www.bosmin.com/PSL/NEGATRONS.pdf
15. http://www.bosmin.com/PSL/GRAVISPHERES.pdf
16. https://en.wikipedia.org/wiki/Graviton
17. http://www.bosmin.com/PSL/InterstellarGravity.pdf
18. https://en.m.wikipedia.org/wiki/Gataxy_rotation curve#
19. https://en.wikipedia.org/wiki/Speed_of_light
20. https://en.wikipedia.org/wiki/Shapiro_time_delay
21. http://www.bosmin.com/PSL/ExposedLight.pdf
22. https://en.m.wikipedia.org/wiki/Radiation_pressure
23. https://en.wikipedia.org/wiki/LIGO
24. https://www.uwa.edu.au/science/-/media/Faculties/Science/Docs/Evidence-for-the-Big-Bang.pdf
25. https://www.schoolsobservatory.org/learn/astro/cosmos/universe/hist
26. http://www.bosmin.com/PSL/BigBangOrSteadyState.pdf
27. https://www.space.com/33892-cosmic-microwave-backgound.html
28. http://www.bosmin.com/PSL/GRAVIMASS.pdf
29. http://www.bosmin.com/PSL/InterstellarGravity.pdf