

# Big Bang or Steady State?

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## **ABSTRACT**

The cause of gravity and its relationship to the formation of the Universe is explored together with a possible relationship between the nearest Black Hole A0620-00/V616 Mon binary system, and Earth.

**Keywords:** Big Bang, Steady State, Gravity Waves, Kruskal Szerkeres, electromagnetic momentum, Gravimass, inverse-square, dark matter, Planck constant, Hubble Telescope, mass collisions, positrons, electromagnetic force, Milky Way, universal gravitation constant, hydronium, electron capture, Mid Atlantic Ridge, Katla eruption, Maya Minimum, Maunder Minimum, Dalton Minimum, Eddy Minimum, Gravisphere

## **1 INTRODUCTION**

The Big Bang theory is currently accepted as the most plausible explanation of the start to our Universe. An alternative theory "Steady State" was extensively argued in mid20th century<sup>1</sup>, but failed through a lack of supporting evidence. "Big Bang" finally gained wide acceptance throughout the scientific communities.

Notwithstanding this general acceptance there remain some significant problems with this theory including:

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

Perhaps it is time to have another look at the Steady State theory with the aid of more recent information, or information presented in a different way.

<sup>1</sup>"Steady State theory". BBC. Retrieved January 11, 2015. "The Steady State theorists' ideas are largely discredited today..."

<sup>2</sup>National Geographic October 2015 Dark Matter *Image by Tom Abel and Ralf Kaehler, Stanford Kavli Institute for Particle Astrophysics and Cosmology*

## 2 THE BIG BANG THEORY

The Big Bang theory is based on the fact that galaxies appear to be moving away from each other at mind numbing speeds, based on the Doppler shift of radiation frequency and known as “Hubble’s Law”.

Therefore, by reversing the process constellations must have logically originated at a point in space as a very compact mass. This became unstable, and exploded in a Big Bang event - the evidence for which is still visible in the universe today as background radiation, shown at (Figure 1)<sup>1,2</sup>

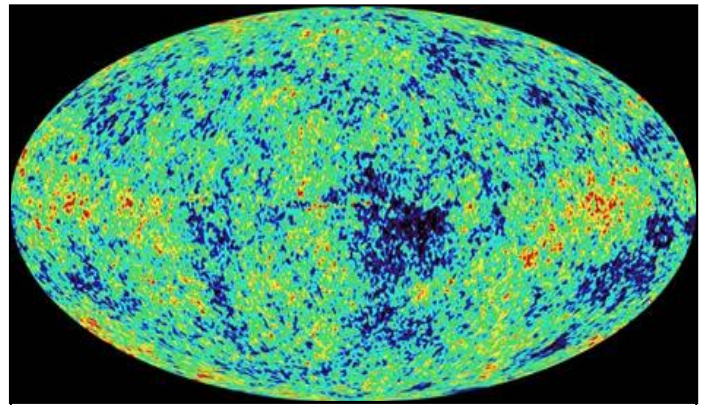


Figure 1 Universe Background Radiation

This reminds me of standing at a conveyor loading point and watching the conveyor belt continuously moving away. (Figure 2 Overland Conveyor)

Now let’s assume there are four such conveyors starting from this point, each one travelling to one of four points on the compass. An uninitiated observer stationed at the centre may draw the conclusion that they were standing where an infinite quantity of conveyor belt rubber forms, moving out along the various conveyors routes and forever getting further and further away. A version of a conveying ‘Big Bang’ theory.



Figure 2 Overland Conveyor

We are assuming here that our observer is not familiar with a conveyor operation and is not aware that there is also a return belt which is out of sight. If

the constellations are moving apart and similarly being replaced by some unsighted mass, this may provide another explanation for the evolution of the universe. In the next chapter we will look at whether “Black Holes” may be a factor in the unseen “return side” of our universal mass conveying system.

<sup>1</sup>NASA WMAP colour-enhanced picture of cosmic microwave background radiation - colours indicate warmer - red - and cooler - blue - spots

<sup>2</sup>Recent research has queried the interpretation of the Doppler Effect used to explain the apparently receding universes which is the basis for Big Bang.

<sup>3</sup>Giovanni P. Gregori has written on this subject as referenced and summarised “In any case, one very heavy consequence of this is that the relativistic Doppler formula is certainly wrong, which is used by astrophysicists. The unique way to check this is by solving the Pioneer paradox (see Gregori, 2010).”

<sup>4</sup>Pers Com 3/3/15 with Robert J. Tuttle.

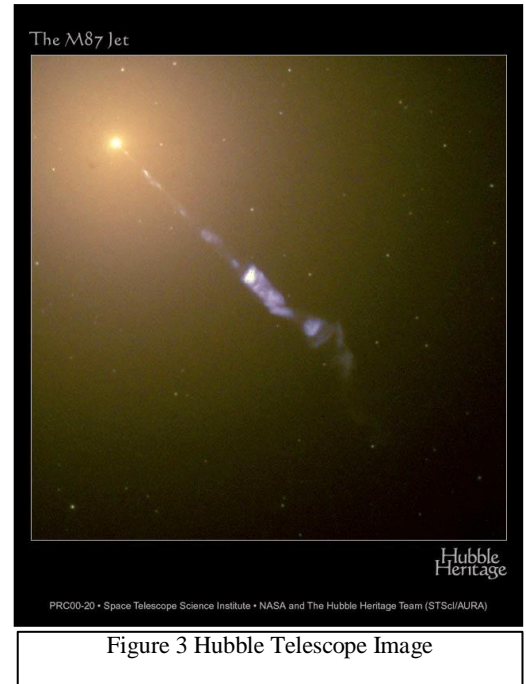
The redshift of spectral lines that is observed for distant spiral galaxies comes from the atoms in an expanding cloud of gas surrounding the galaxy, not from the galaxy itself, and so does not indicate motion of the galaxy. The blueshifted spectral lines from atoms expanding towards us is absorbed and scattered out of sight by the gas and dust along our line of sight. The redshifted spectral lines from atoms expanding away from us is less effectively absorbed and scattered by the gas and dust, and this effect becomes stronger at greater distances, through more and more gas and dust, which gives a relationship between apparent redshift and distance. We see the redshifted light but not the blueshifted light. The greater the distance, the redder the light has to be. There is no observational evidence for galaxy recession, and so no evidence for expansion

### 3 THE UBIQUITOUS BLACK HOLE

Black Holes seem to be a well-accepted part of cosmology, even though studying them is difficult because they are seen by inference rather than directly. The most notable evidence is the motion of stars near a Black Hole, which circle ever closer before disappearing into what is evidently a region of very high gravitational force.

There is also a big difference in the size of Black Holes, with the largest ones appearing to be in the centre of some galaxies.

Other evidence for Black Holes includes an occasional mega beam of light which seems to originate from the poles of a Black Hole, as seen through the Hubble telescope. (Figure 3 Hubble Telescope Image)



## 4 MASS COLLISIONS

Two bodies on a collision course normally bounce off each other as with billiard balls. However, in the case of meteorites entering Earth's atmosphere there is usually absorption of the smaller body with the Earth, albeit with heat and melting involved. In the case of Black Holes, we move to a much higher level of absorption where the incoming body appears to be completely degraded atom by atom.

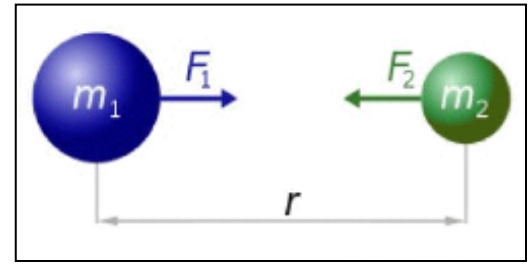


Figure 4 Law of Universal Gravitation

Isaac Newton's famous law of universal gravitation, illustrated in Figure 4, states the attractive force ( $F$ ) between two bodies is proportional to the product of their masses ( $m_1$  and  $m_2$ ), and inversely proportional to the square of the distance  $r$  between them:  $F_1 = F_2 = G \frac{m_1 m_2}{r^2}$  (1)

The important aspect of this formula is the term  $r$ , because as a mass gets close to a Black Hole, the distance  $r$  moves towards zero. If we use our calculators to divide any number by zero, we finish up with a *data error message!* Taking a closer look at what happens **just** before  $r$  reaches zero. Assume we have a mass approaching the Black Hole from the right hand side in Figure 5, and the value of  $r$  starts to reduce towards zero. As the mass approaches the Black Hole it has two choices, it can either shoot up and/or down the vertical axis.

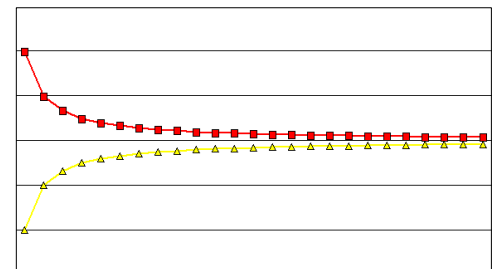


Figure 5 Graphical representation of an object approaching a Black Hole where the Law of Universal Gravitation becomes unstable and the object path becomes hyperbolic

Theoretically, it can continue doing this until it reaches infinity in either direction, but never quite hitting either vertical axes. These curve shapes are described as hyperbolas, and the axes the curves approach are known as asymptotes.

Mathematicians Kruskal and Szekeres<sup>1</sup> determined that there are four hyperbolas associated with Black Holes and summarised their findings in the diagram shown in Figure 6.

It appears that getting ever closer to the asymptote axes associated with Black Holes is far from straight forward. At Black Holes, these axes are also described as event horizons<sup>2</sup>. Now, consider how close we can get to the axes, and how the four segments shown maybe involved.

It is interesting to note here that the four quadrants shown in the Figure 6 Kruskal Szekeres diagram may be assigned to:

- The incoming mass.
- The stripped electrons.
- The radiated cosmic rays.
- The residual neutrons.

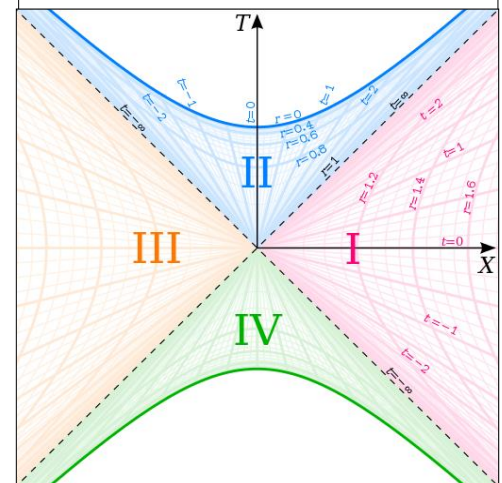


Figure 6 Kruskal Szekeres Diagram

<sup>1</sup> The Kruskal Szekeres diagram is simply derived by Glenn Rowe who was a lecturer in mathematics and then computing at the University of Dundee from May 1984 until December 2008. His presentation Kruskal-Szekeres coordinates and the event horizon is available online at <http://www.physicspages.com/2013/11/27/kruskal-szekeres-coordinates-and-the-event-horizon/>

<sup>2</sup> As discussed by S. W. Hawking and G. F. R. Ellis (1975). The large scale structure of space-time. Cambridge University Press. Thorne, Kip S.; Misner, Charles; Wheeler, John (1973). Gravitation. W. H. Freeman and Company. Wald, Robert M. (1984). General Relativity. Chicago: University of Chicago Press. J. A. Peacock (1999). Cosmological Physics. Cambridge University Press.

## 5 THE PLANCK CONSTANT

In 1900 Max Planck proposed that material travelling down a curve actually travels in small steps, rather than a continuous smooth progression. This revelation formed the basis for the theory of quantum mechanics.

The theory involves many technical considerations which are the foundations for a separate branch of academic study with many conundrums and many alternative views. For the purpose of this discussion we will concentrate on the founding principle that the dimension of the plank constant<sup>1</sup> is equivalent to the space between successive electron rings in an atomic structure (Figure 7).

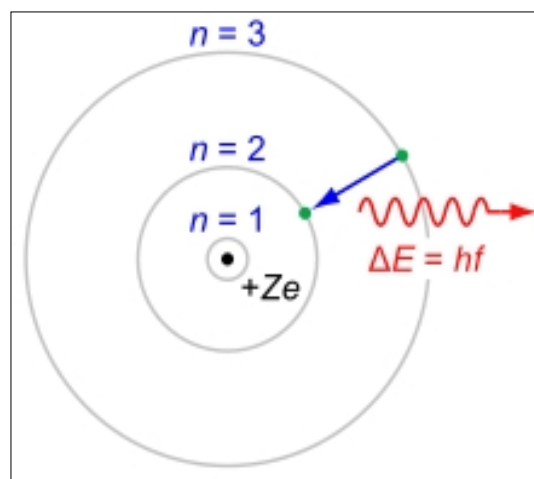


Figure 7 Plank Constant is equivalent to the distance between the electron shells

A molecule can be graphically represented (Figure 8)<sup>2</sup> as a central nucleus comprising some positively charged protons together with some neutrally charged neutrons. Orbiting around the nucleus are the negatively charged electrons.

As a molecule approaches a Black Hole, the outer extremities, or the electrons, are the first to get sheared away by the high gravitational forces present at the event horizon. The rings of negatively charged electrons progressively fall away in a series of steps in accordance with Planck's theory.

Eventually, the molecule only consists of positively charged protons and neutrons. The positively charge protons are very unstable as the similar charges repel each other, so the protons exit as cosmic radiation<sup>3</sup>, and sometimes as a light beam of photons, as seen by the Hubble Telescope in Figure 3.

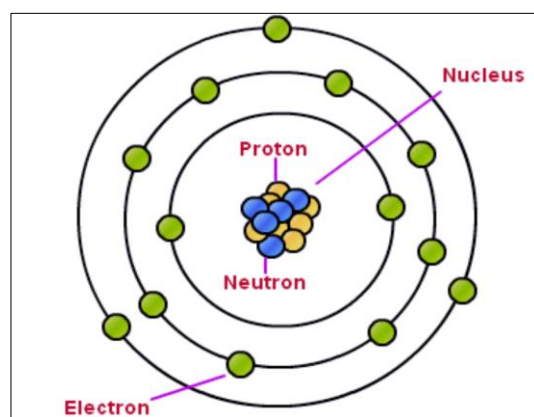


Figure 8 molecule with electrons orbiting around a central nucleus

Neutrons remain and are absorbed at the site. They serve to increase the mass of the structure, and hence the gravitational pull associated with the Black Hole.

<sup>1</sup> Barry N. Taylor of the Data Center in close collaboration with Peter J. Mohr of the Physical Measurement Laboratory's Atomic Physics Division, Termed the "2014 CODATA recommended values," they are generally recognized worldwide for use in all fields of science and technology. The values became available on 25 June 2015 and replaced the 2010 CODATA set. They are based on all of the data available through 31 December 2014. Available: <http://physics.nist.gov>

<sup>2</sup> Diagram at Web reference: <http://chemistry.tutorvista.com/nuclear-chemistry/protons-and-neutrons.html?view=simple>

<sup>3</sup> Sharma (2008). Atomic And Nuclear Physics. Pearson Education India. p. 478. ISBN 978-81-317-1924-4. Cosmic rays are immensely high-energy radiation, mainly originating outside the Solar System.[1] They may produce showers of secondary particles that penetrate and impact the Earth's atmosphere and sometimes even reach the surface. Composed primarily of high-energy protons and atomic nuclei, they are of mysterious origin.

## 6 INVERSE SQUARE LAW

In physics, an inverse-square law is any physical law stating that a specified physical quantity or intensity is inversely proportional to the square of the distance from the source of that physical quantity.

The equation and graphic form are as illustrated, in Figures 9 and 10<sup>1</sup>. Equation (1) is an example of the inverse square law.

At Black Holes, we have assumed the electrons stripped from the outside molecular shells are absorbed by the Black Hole.

Stripping electrons from a molecule shell is a very energy intensive activity, and much less than the gravitational force attracting an electron to a molecule.

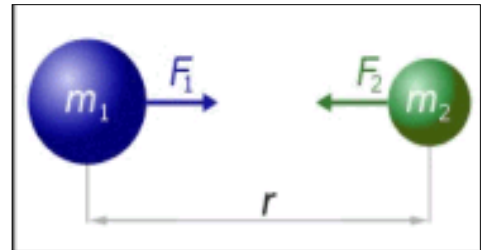


Figure 9 Inverse Square Law Relationship

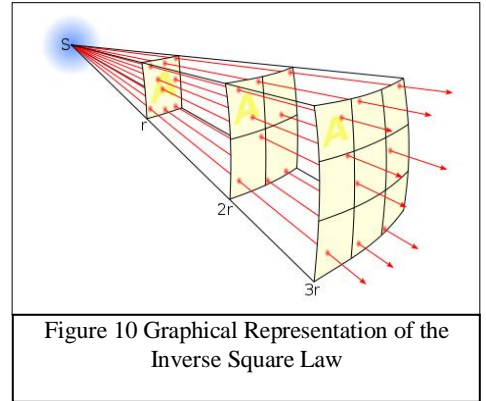


Figure 10 Graphical Representation of the Inverse Square Law

It is reported that<sup>2</sup>

*“the gravitational force can appear extremely weak compared with other fundamental forces. For example, the gravitational force (Fg) between an electron and proton one meter (d1) apart is approximately 10<sup>-67</sup> newton, while the electromagnetic force between the same two particles still 1 metre apart is approximately 10<sup>-28</sup> newton. Both these forces are weak when compared with the forces we are able to experience directly, but the electromagnetic force in this example is some 39 orders of magnitude (i.e. 10<sup>39</sup>) greater than the force of gravity—which is even greater than the ratio between the mass of a human and the mass of the Solar System!”*

This information is useful for checking to see how far away a Black Hole would have to be from Earth if the cause of our gravity turned out to be a Black Hole stripping electrons. Now we can check to see if the gravitational attraction on Earth is related to the much stronger electromagnetic force at a Black Hole.

Let us assume Fg (gravitational force) between the two objects (electron and proton) reduces with distance from a Black Hole, as per the inverse square law, and d1 is 1 metre. Then d2 is the distance to a Black Hole and the electromagnetic force between the electron and its atom is Fe.

$$\frac{F_e}{F_g} = \frac{d1^2}{d2^2} \quad (3)$$

So d2 is equal to  $\sqrt{\frac{F_e}{F_g}}$  the term d1 is equal to 1, and d2 becomes  $\sqrt{\frac{F_e}{F_g}}$

We can calculate the distance d2 which is 3.16<sup>19</sup> metres away. Converting that distance to light years, (divide by 9.64<sup>15</sup> metres). Distance from Earth is 3,343 light years.

We can check how that distance compares with what we know of regional Black Holes.

<sup>1</sup> Diagram and relationship as per website: [https://en.wikipedia.org/wiki/Inverse-square\\_law](https://en.wikipedia.org/wiki/Inverse-square_law)

<sup>2</sup> George T. Gillies. "The Newtonian gravitational constant: recent measurements and related studies". *Reports on Progress in Physics*, 60:151-225, 1997. Text at [http://www.worldwizzy.com/library/Gravitational\\_constant](http://www.worldwizzy.com/library/Gravitational_constant)

## 7 OUR MILKY WAY GALAXY

Earth is located in the Solar System on one of the outer arms of the Milky Way (Figure 11).

Several stellar mass Black Holes have been identified in our Milky Way galaxy<sup>1</sup>. (Figure 12)

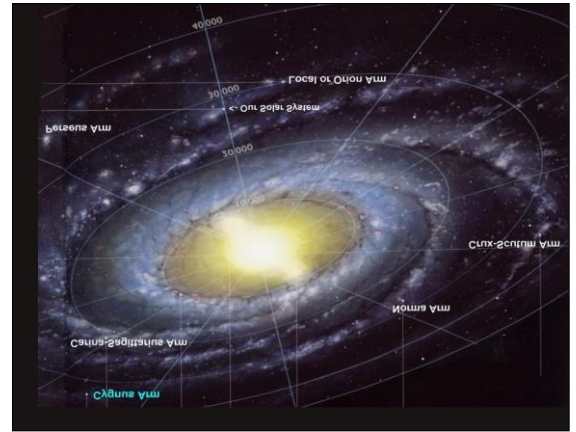


Figure 11 Pictorial representation of the Milky Way Galaxy

One of the more imposing Black Holes in our region goes by the title of A0620-00/V616 Mon, (V616) described as

*“This binary system is located at a distance of approximately 3,000 light years, making the system the likely location of the nearest known Black Hole.”<sup>2</sup>*

Other Milky Way Black Hole objects are shown in Figure 12,<sup>3</sup> and are depicted in estimated size as well as geographical relation to the Solar System by converting polar astronomical units to Cartesian 3D units.

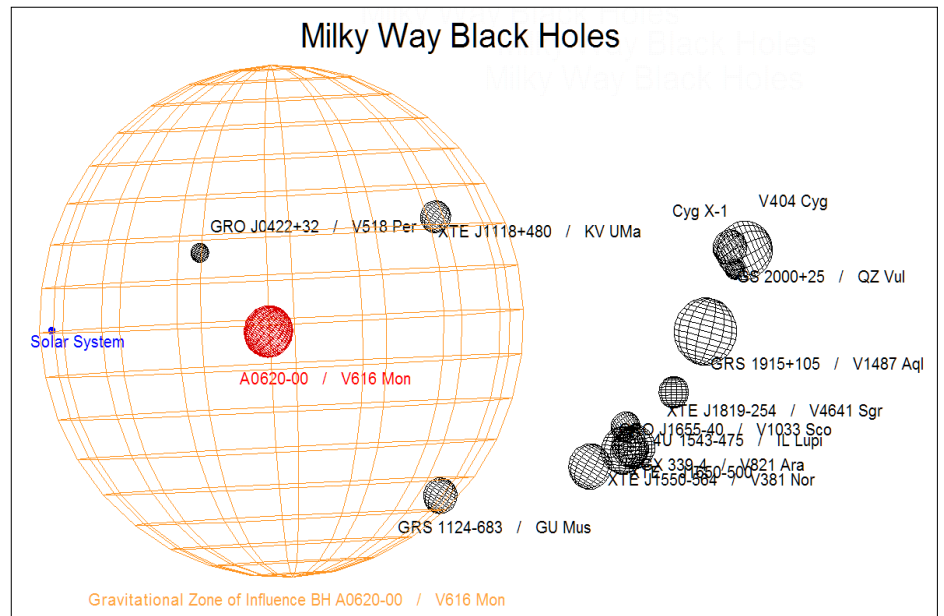


Figure 12 Stellar Masses considered as potential Black Holes in Earth’s region of the Milky Way Galaxy

<sup>1</sup> The Hubble Telescope Special Feature site at [http://hubblesite.org/explore\\_astronomy/reports](http://hubblesite.org/explore_astronomy/reports) "The Milky Way galaxy contains some 100 billion stars. Roughly one out of every thousand stars that form is massive enough to become a black hole. Therefore, our galaxy must harbor some 100 million stellar-mass black holes."

<sup>2</sup> Gelino, Dawn M., et al. "A Multiwavelength, Multiepoch Study of the Soft X-Ray Transient Prototype, V616 Monocerotis (A0620-00)". *The Astronomical Journal*, Volume 122, Issue 5, pp. 2668-2678, November 2001.

Thomas E. Harrison, Steve B. Howell, Paula Szkody, France A. Cordova; "The Nature of the Secondary Star in the Black Hole X-Ray Transient V616 Mon (=A0620-00)"; *The Astronomical Journal*, Volume 133, Issue 1, pp. 162-168. January 2007; *arXiv:astro-ph/0609535* ; *Bibcode: 2007AJ....133..162H* ; *doi:10.1086/509572*

University of Texas observatory retrieved 19/09/2011

Web Reference:<https://en.wikipedia.org/wiki/A0620-00>

<sup>3</sup> Robert A Beatty 2015 Diagram composed from Milky Way estimates of Black Hole locations and presented in Cartesian coordinates with Earth at origin.

Abstract- T.R.Marsh,E.L.Robinson,J.H.Woods *absabs.harvard* retrieved 24/7/2010

T.R.Marsh,E.L.Robinson,J.H.Wood (1993) The Royal Astronomical Society (copyright) retrieved 19/09/2011

university of Texas observatory retrieved 19/09/2011

“Approximately 3,000 light years” (ly) when compared to 3,343 ly is within the levels of accuracy for both the astronomical measurements and our method of calculation. We can therefore assume Black Hole V616 may be associated with gravitation effects on Earth.

Gravitation is frequently depicted as a net<sup>1</sup> (Figure 13) which constrains orbiting bodies to follow a stable path, and is generally considered as a force of attraction between two masses.

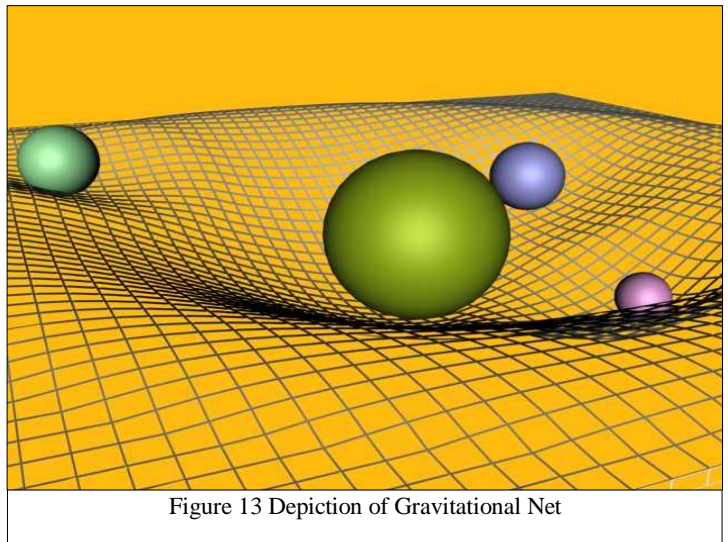


Figure 13 Depiction of Gravitational Net

It may be more accurate to regard gravitation as a surface tension effect drawing two masses together (which may lead to a mathematical solution to explain why two masses are attracted to each other), while the centrifugal force keeps them separated. Rhythmic variations between the two forces results in elliptical orbits.

The biggest Black Hole in the Milky Way is at its centre and named Sagittarius A<sup>2</sup> and is approximately 25,900 ly away from Earth. The Inverse Square Law, tells us the effect on Earth’s gravitation from this large source is  $(3000/25900)^2$  less than for V616, or only 1.4% as strong, because of the much greater distance.

**Interim Conclusion:**

Big G has an interesting genesis starting from the work by Henry Cavendish and summarised [here](#). As noted previously the comparison between the gravitational force of attraction between an electron and a proton, compared to that with the much stronger electromagnetic force between the same two objects, is 39 times greater, and the responsible Black Hole must lie some 3,343 light years away from Earth.

This seems a logical conclusion because we know that gravitational forces are very strong at Black Holes, but there is no suggestion as to how far that influence extends. If gravity turns out to be some form of electromagnetic force, the influence should extend, to a waning extent, more or less indefinitely.

The value for G is quoted (at the Cavendish reference above) " $G = 6.693 \times 10^{-11}$  cubic meters per kilogram second squared, with a standard error of the mean of  $\pm 0.027 \times 10^{-11}$  and a systematic error of  $\pm 0.021 \times 10^{-11}$  cubic meters per kilogram second squared." The systemic error amounts to  $\pm 0.021/6.693 = 0.0031376$ . If we apply this limit of accuracy to the black hole distance, we find  $0.0031376 * 3,343ly = \pm 10.49ly$ .

The solar system Oort cloud has a diameter of  $15 \times 10^{12}$  km, and one light year is equal to  $9.4607 \times 10^{12}$  km, so the solar system effectively has a diameter 1.58ly (well inside the 10.49ly G accuracy limit). So G can only be regarded as constant over shorter - solar distance type - measurements. When we consider our gravisphere type distances G increases, and gravity should be regarded as a polar force with the positive end directed towards the Monoceros Nebula

We can expect that G at V616 surface will have a value 39 times greater, or  $G = 6.693 \times 10^{28}$  cubic meters per kilogram second squared. At these levels, it seems reasonable to assume there will be no need to introduce the concept of "dark matter" to account for the missing gravity as postulated by [Cornell](#) for example.

<sup>1</sup> Dave Reneke's World of Space and Astronomy. *Image included with discussion at Website: <http://www.davidreneke.com/newton-and-that-apple/>*  
<sup>2</sup> Reynolds 2008  
 Overbye, Dennis (8 June 2015). "Black Hole Hunters". *NASA*. Retrieved 8 June 2015.  
 Overbye, Dennis; Corum, Jonathan; Drakeford, Jason (8 June 2015). "Video: Peering Into a Black Hole". *New York Times*. ISSN 0362-4331. Retrieved 9 June 2015. Cited at [https://en.wikipedia.org/wiki/Sagittarius\\_A\\*](https://en.wikipedia.org/wiki/Sagittarius_A*)



## 8 BLACK HOLE MYSTERIES

The Figure 6 Kruskal Szekeres Diagram reveals four disassociated regional components at a Black Hole as previously discussed. The stripped electrons were not assigned any particular ongoing function, but noted they were absorbed by the Black Hole. Matter does not just disappear, although it can transform as Albert Einstein so adequately demonstrated in his Theory of Relativity.

More detail is proposed for how the KS Diagram may operate at Black Holes, as shown in Figure 14<sup>2</sup>. It appears that incoming mass entering a Black Hole approaches the first event horizon and starts to follow a hyperbolic path which initially strips off the electrons due to their peripheral positions around atoms.

These are followed by the protons which are immediately expelled from the Black Hole due to their positive charge. These particles form into cosmic rays which are seen emerging from either ends of the Black Hole axis<sup>1</sup> in some space photographs.

The neutrons have no electrical charge and remain within the Black Hole thereby adding to its mass.

The electrons move across to the second event horizon and emerge on the other side of the Black Hole at either end of the hyperbolic axis. The electrons emerging from the right hand side of the second event horizon are spinning in a clockwise direction, and assume a positive charge called positrons. Electrons emerging from the left hand end of the event horizon have a standard anticlockwise spin with a negative charge.

As the positrons and electrons move down the hyperbolic axis they associate to form into a neutrally charged gravitation net, which is stronger near the Black Hole and weaker with increasing distance. This weakening effect follows the inverse square law, as discussed previously.

Further work is progressing on this aspect of investigation at GRAVISPHERES.<sup>3</sup>

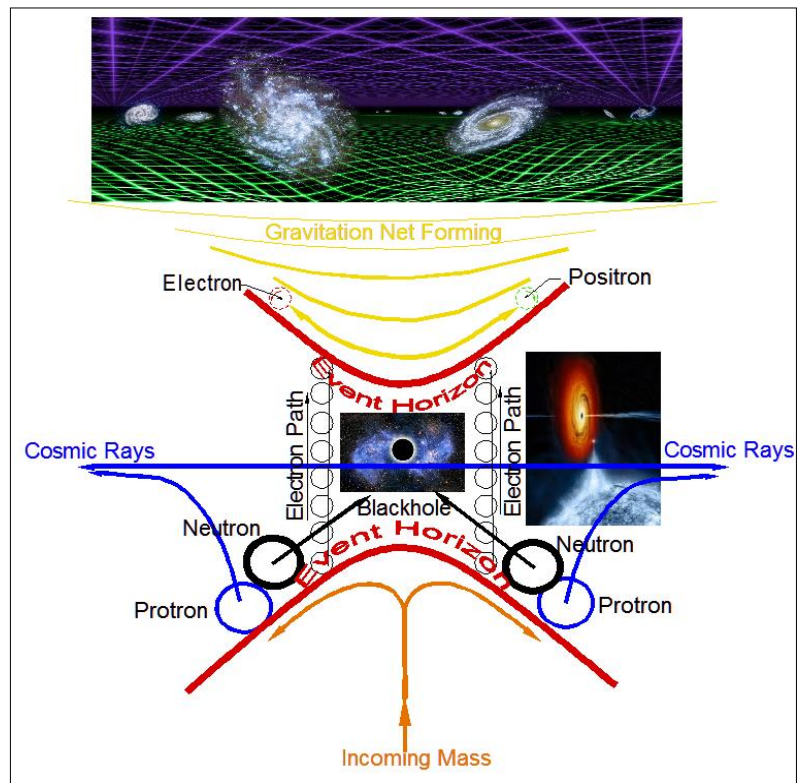


Figure 14 Black Hole structure showing incoming mass moving along the first Event Horizon where electrons, protons and neutrons are progressively stripped off. These components form into gravitation waves, cosmic rays and enhanced Black Hole mass, respectively

<sup>1</sup> Nature International Weekly Journal of Science 9<sup>th</sup> November 2007 "The highest-energy cosmic rays that bombard Earth have been traced to their source — rare galaxies with supermassive black holes at their centre." Web reference: <http://www.nature.com/news/2007/071109/full/news.2007.233.html>

<sup>2</sup> Robert A Beatty 2015 Collage diagram depicting physical actions possibly occurring at a Black Hole. Including Web references

A: <http://www.startalkradio.net/show/cosmic-queries-gravity-repeat/>

B: <http://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-a-black-hole-k4.html>

C: <http://phys.org/news/2013-09-goodbye-big-black-hole-theory.html>

<sup>3</sup> <http://www.bosmin.com/PSL/GRAVISPHERES.pdf>

It is interesting to note the discovery of positrons in space:

Physics Today<sup>1</sup> reports

*“An excess of positrons has been detected by the Alpha Magnetic Spectrometer (AMS), which collects cosmic rays from its perch on the International Space Station. Although cosmic rays are composed of many different types of particles, including positrons, the increase noted by the AMS could be an indication of the presence of dark matter”*,

and similarly, as shown in Figure 15<sup>2</sup>

The inverse square law connection between our nearest Black Hole and Earth, suggests gravity nets have properties similar to wave action.

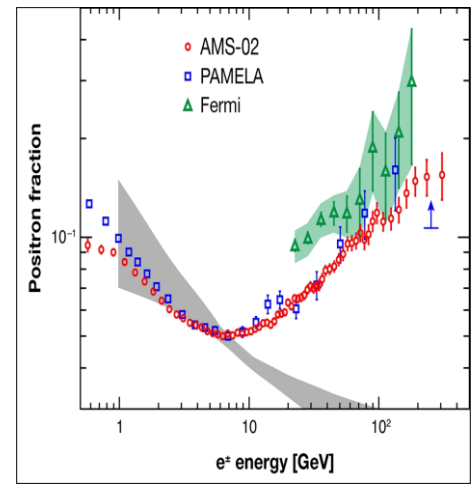


Figure 15: Positrons Galore

<sup>1</sup> Physics Today 22 September 2014 Excess of positrons in space may be indication of dark matter *AIP Scitation*

<sup>2</sup> Stephane Coutu, April 3, 2013 • Physics 6, 40 Viewpoint: Positrons Galore *Institute for Gravitation and the Cosmos, Departments of Physics and of Astronomy and Astrophysics, Pennsylvania State University, University Park, PA 16802-6300, USA*

## 9 WAVES

Wave actions come in two distinct categories: Mechanical waves, and Electromagnetic waves. Mechanical waves are the easiest to conceive with sea waves being a good example of a common variety. Sea waves operate in a wide variety of physical forms, and it is worth reminding ourselves of some of these features<sup>1</sup>.

Of particular note is the impact waves have on shorelines and the obvious pressure that wave action exerts on some coast lines. This raises the question of what would happen if the coasts were not fixed, but free to move in space as Black Holes appear to.

We can imagine the effect wave action would have on a raft floating in a pool with no motive power, other than an eccentric drive motor designed to make the raft bob up and down on the spot, creating a radiating wave pattern.

Now imagine two such rafts in the pool, (Figure 16)<sup>2</sup> both rafts are affected by the wave action of the adjacent raft, forcing them to move apart. Similarly, several such floating rafts could all be expected to move away from each other.

Mechanical waves do not travel through the vacuum of space, due to a lack of a transporting medium. However, Electromagnetic Waves (EM) can travel through a vacuum.

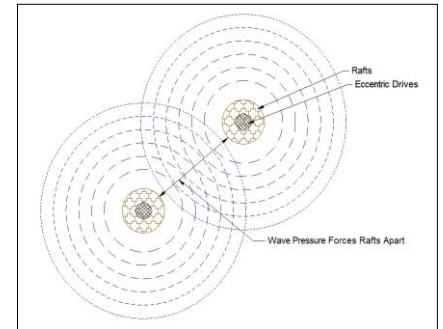


Figure 16 Two rafts moving apart due to interacting wave action.

<sup>1</sup> Water Encyclopedia, Web reference: <http://www.waterencyclopedia.com/Tw-Z/Waves.html>

<sup>2</sup> Robert A Beatty 2015 Schematic drawing showing possible result from opposing waves actions.

It is interesting to see just how EM waves propagate through space, and to compare that action with mechanical waves<sup>1</sup>.

This raises the question of whether electromagnetic waves can exert any pressure.

Wave pressure from electromagnetic waves can be quantified. It is a very small amount, but certainly does exist and is described as radiation pressure. Another way to describe this effect is to consider it as shown in Figure 17 Electromagnetic Momentum<sup>2</sup>.

Since EM waves can exert pressure, and if they are formed at Black Holes, then Black Holes can be postulated to move away from other Black Holes. In this way, EM provides a mechanism to explain the Expanding Universe even though the rate of that expansion may have been over stated through application of the Doppler Effect. (See footnote on Page 2).

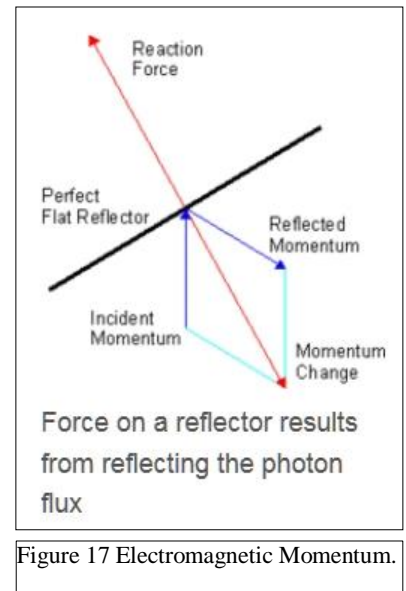


Figure 17 Electromagnetic Momentum.

We can conclude that gravity waves, like so many other physical phenomena have yin and yang components. Similarly: Magnetic poles attract when the poles are dissimilar and repel when they are the same. Like static electrical charges repel and unlike charges attract.

So it appears possible with gravity waves, that they can repel other gravity waves, but also cause mass objects in their fields of influence to attract one another.

An interesting corollary is that the value for Big G (the universal gravitation constant) as presented in Equation 1 as  $F_1 = F_2 = G \frac{m^1 x m^2}{r^2}$  may not be constant throughout the universe – as it is commonly assumed.

It may be that G gets progressively larger as we approach a Black Hole which would alter our basic understanding of this empirical physical constant.

Equation 1 highlights the possibility that if G varies throughout the universe, so too would the apparent force of attraction between the two masses  $m^1$  and  $m^2$ . This provides a possible explanation for some astronomical observations without having to invoke the hypothetical concept of “Dark Matter”.

<sup>1</sup> The Physics Classroom Propagation of an Electromagnetic Wave. Website: <http://www.physicsclassroom.com/mmedia/waves/em.cfm>

<sup>2</sup> Known as the John Henry Poynting (1852-1914) vector, radiation momentum. Radiation pressure is the pressure exerted upon any surface exposed to electromagnetic radiation. Website: [https://en.m.wikipedia.org/wiki/Radiation\\_pressure](https://en.m.wikipedia.org/wiki/Radiation_pressure)

## 10 CONVERTING ENERGY TO MASS

Albert Einstein showed that mass could convert to energy in his famous equation  $E = MC^2$  where E is energy, M is mass and C is the speed of light. The question now is does energy also convert to mass through  $M = E/C^2$ .

Energy does convert to mass and is quantified as “adding 25 kilowatt-hours (90 megajoules) of any form of energy to any object increases its mass by 1 microgram”<sup>1</sup>

Our Sun provides energy to the Earth which is estimated at around 3kWh/day/m<sup>2</sup> (Figure 18)<sup>2</sup>. The semi surface Earth area is 255,032,236 Km<sup>2</sup>. So the solar energy received as radiation from the Sun and converted to mass on Earth is about 7,000 tonnes per annum.



Figure 18 The Sun As A Source Of Energy

Mass is converted from energy on a routine basis in particle accelerators. It is sufficient for this discussion to be aware of the existence of topical research involving various quantum particles. One day those investigations may be able to itemise how gravity waves form from sub atomic particles. In the mean time we will assume that the effect is real and concentrate on how it might influence the Earth.

Some interesting research was conducted by Professor Henrik Svensmark, Danish National Space Institute, Copenhagen. His team were working on seeking an explanation for the formation of clouds on Earth. His preliminary work involved the use of a cloud chamber. They eventually reported<sup>3</sup>

*“The results concluded that the climate of Earth is decisively influenced by exploding stars and additionally: This mechanism literally turns the Earth’s thermostat upside down. This means that Cosmic rays produces aerosols in our atmosphere, which are necessary for the formation of clouds. Without these aerosols water vapour cannot condense into droplets and form clouds.”*

His work is recorded in a two part video series which, in part #1 @ 21.33 minutes, includes comment from Professor Richard Turco, University of California.

*“We became interested in how aerosols or very small particles are produced in the atmosphere in the first place. This is important because all clouds are formed on aerosol particles. We found the cosmic rays are capable of a significant modulating affect on aerosols in the lowest layer of the atmosphere We don’t understand at this point is exactly how and why they are formed.”*

<sup>1</sup> Center of Excellence in Scientific and Technological Innovation. Mass–Energy Equivalence. Website:<http://drmgrhscsx-sti.com/mass-energy-equivalence/>

<sup>2</sup> The Sun As A Source Of Energy. Part 2: Solar Energy Reaching The Earth’s Surface. ITICA organisation. Website:<http://www.itacanet.org/the-sun-as-a-source-of-energy/part-2-solar-energy-reaching-the-earths-surface/>

<sup>3</sup> Director & Producer: Lars Oxfeldt Mortensen 2008 The Cloud Mystery Program Video by Mortensen Film Web reference:[http://www.dr.dk/Salg/DRsales/Programmes/Documentary/Science\\_and\\_Environment/The+Cloud+Mystery.htm](http://www.dr.dk/Salg/DRsales/Programmes/Documentary/Science_and_Environment/The+Cloud+Mystery.htm)

This is interesting comment, because it appears the aerosols are formed by the action of the incoming cosmic rays - which we have previously noted contain a high proportion of protons.

It is possible to form a Hydronium ion (Figure 19)<sup>1</sup> by adding a proton to a water molecule. This reference goes on to show hydronium may be bonded to three neighbouring water molecules, thereby forming an aerosol.

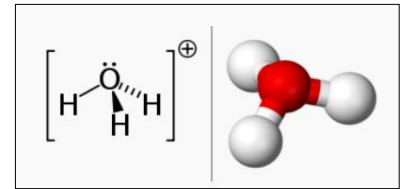


Figure 19 Hydronium Ion

The basic mechanism would be for a cosmic ray to deliver a proton into a cloud, with an electron from gravity waves, combining with the proton to form the hydrogen atom. The hydrogen can subsequently combine with oxygen to form a water molecule.

In this way water may form on Earth by direct influence from cosmic rays and gravity. This may explain where some of the water on Earth came from, and why the hydrogen component of water vapour which is lost to space at high altitudes, can be progressively replaced.

If a cosmic ray interacting with a gravity supplied electron can produce hydrogen, the next step would be to produce helium consisting of two electrons orbiting two protons and one or two neutrons - depending on the atomic form of helium.

This raises the question of where does the one or two neutrons come from? A process described as Electron capture occurs when an inner electron melds with a core proton.

Electron Capture further described as<sup>2</sup>

*“the process wherein the proton rich element absorbs the inner electron so that a proton is turned to the neutron. In this process a neutrino is emitted. It is the primary decay mode of the isotopic elements. It is the reverse phenomenon of the beta decay and hence sometimes named as inverse beta decay.”*

There may be other mechanisms for adding mass to the Earth. We have elsewhere considered how planets orbiting around a sun are bound by an elastic link (gravity) as opposed to a fixed link. The elastic gravitational link may result in the consumption of energy which converts to mass herein described as Gravimass<sup>3</sup>. This calculates to a further accumulation of 212,245 tonnes per annum, which also adds consideration to the generally discarded Expanding Earth theory.

<sup>1</sup> Jian Tang and Takeshi Oka (1999). "Infrared spectroscopy of H<sub>3</sub>O<sup>+</sup>: the ν<sub>1</sub> fundamental band". *J. Mol. Spectrosc.* 196 (1): 120–130.

*Bibcode:1999JMoSp.196..120T. doi:10.1006/jmsp.1999.7844. PMID 10361062. Web Reference:https://en.m.wikipedia.org/wiki/Hydronium*

<sup>2</sup> TutorVista.com Protons and Neutrons *Web Reference: http://chemistry.tutorvista.com/nuclear-chemistry/protons-and-neutrons.html?view=simple*

<sup>3</sup> Robert A Beatty 2014 Gravimass *Draft document web reference: http://www.bosmin.com/PSL/GRAVIMASS.pdf*

Correlation between solar minimum and earthquake activity is presented at *Is Katla Ready to Erupt?*<sup>1,2</sup> by John L. Casey:

*Just over the North Atlantic Ocean from the United States lies a geophysical threat that may be close to unleashing hell on Earth. It is Iceland's dangerous Katla volcano.*

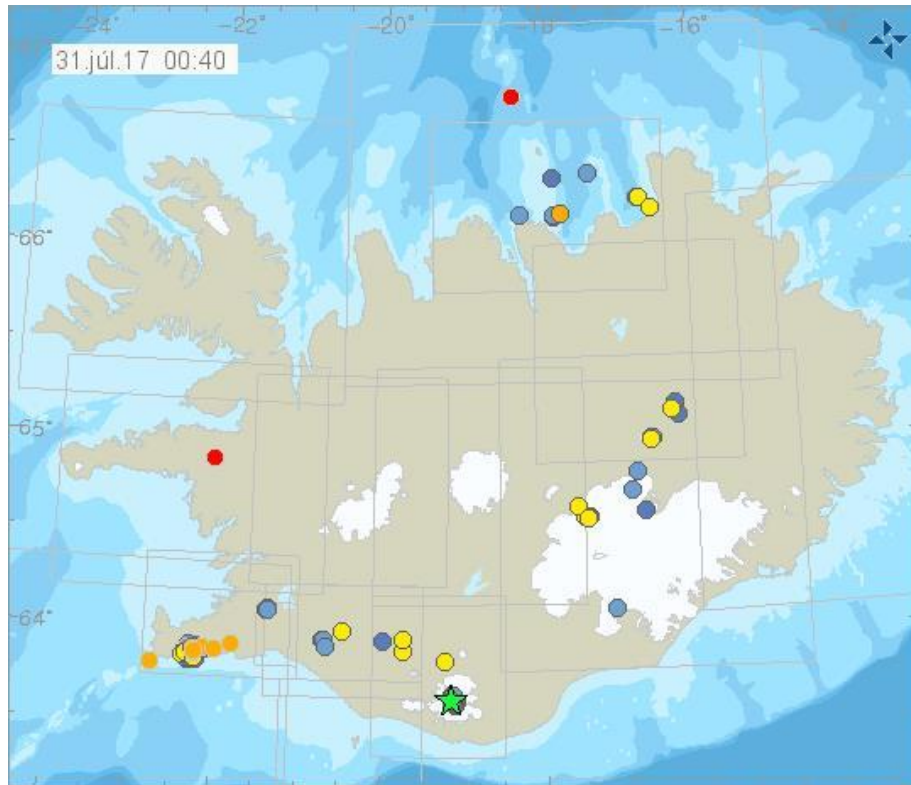


Figure 1. Map of Iceland showing earthquakes on July 31, 2017. Small colored circles are less than M3.0 magnitude. The only quakes greater than M3.0 are marked by the green star – the location of Mt. Katla which is beneath the Myrdalsjokull glacier. Source: Icelandic Met Office.

And:

*We have now begun the early phase of the next grand solar minimum or “solar hibernation.” The so called “Eddy Minimum” will be fully installed during solar cycle 25 and 26 (starting in 2020) according to research done by myself and others. Major volcanic and earthquake activity has already started in some areas, during the steep decline in solar activity witnessed during the current waning phase of solar cycle 24. NASA has also confirmed we are entering a long term period of low solar activity. It turns out that eruptions of the Katla volcano are very much correlated to solar minimums as Table 2 below shows.*

**Table 2 – Relationship of Katla Eruptions to Solar Minimums**

<b>Year of Eruption</b>	<b>Associated Solar Minimum</b>
920 AD	Mayan Minimum
1612 AD	Maunder Minimum
1823 AD	Dalton Minimum
TBD	Eddy Minimum (2014-2045)

This information suggests that expanding Earth may be a spasmodic event which is further evidenced by the periodic lava outflows discovered in the matching ridges on either side of the Mid Atlantic Ridge.

<sup>1</sup> <https://principia-scientific.org/is-katla-ready-to-erupt/>

<sup>2</sup> <https://adventures.is/blog/is-katla-volcano-erupting/>

## 11 CONCLUSIONS

- 1) There is an apparent correlation between low sun spot activity resulting in a greater incidence of cosmic rays reaching the Earth which results in the formation of more mass. This is expressed as greater seismic activity, increased movement across mid ocean ridges, and more active volcanoes.
- 2) Electron capture leads to the possibility for building a wide range of elements on Earth from protons and electrons arriving predominantly from Black Hole V616. The same process may occur throughout the universe which effectively closes the “Steady State” loop.
- 3) Black Holes are postulated to move away from other Black Holes due to Electromagnetic Momentum effects. In this way, we can suggest a mechanism to explain the Expanding Universe even though the rate of that expansion may have been previously overstated by application of the Doppler Effect.
- 4) A mechanism is proposed which can add mass to the Earth not necessarily caused by Earth's interior, but by the exterior mass growing through the Sun and cosmic energies. This adds weight to the Expanding Earth theory.
- 5) There appears to be a cycle of mass rebirth from objects consumed at black holes.
- 6) Gamma rays appear to originate from black hole pole regions.
- 7) Material entering a black hole appears to follow a hyperbolic path of disintegration associated with Plank constant incremental steps.
- 8) Gravitation constant  $G$  varies according to the Inverse Square law, and may obviate the need for ‘dark matter’ to explain some universe observations. Black Hole V616 is at a distance from Earth which ties in with it also being the source of Earth’s gravitation field.
- 9) Mass accumulates on Earth due to radiation from the Sun, and due to energy expended in keeping Earth in orbit around the Sun.
- 10) Aerosols are formed by the action of the incoming cosmic rays which then results in the formation of some cloud banks. The process of electron capture may account for additional mass being added to Earth.



## 12 ACKNOWLEDGEMENTS

I particularly acknowledge;

Mr. John L. Casey is the author of the 2011 climate book, "Cold Sun," and its 2014 remake, "Dark Winter," now a nationwide best seller. He is currently the President of Veritence Corporation, a science and engineering consulting company, and CEO of the International Earthquake and Volcano Prediction Center (IEVPC), in Orlando, Florida.

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Several of my friends and relatives have read the draft and provided encouragement, for which I thank them, although the subject is of a specialised nature and not commonly discussed.

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