GRAVIMASS

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ABSTRACT
Expanding Earth and Plate Tectonics theories can coexist. Sima layers can subduct below Sial layers and Crust layers can thin and rift through the influence of underlying magma movement. It is possible that Earth could have expanded up to 16% over 4.5by in which case, mass is being accumulated at a rate of 212,245 tonne per annum. The universal gravitational constant G must vary throughout the universe depending on proximity to the nearest black hole. Opposing black hole gravity waves might repel each other creating an ever expanding universe. Material entering a black hole region is expected to follow a hyperbolic path which asymptotes towards plus and minus event horizons. As it approaches a horizon it encounters the Plank Constant which prevents it getting any closer. The nearest significant black hole to Earth is at a range which concurs with the calculated inverse square distance adding weight to the theory that gravity waves form at black holes. Expansion on Earth may not be a liner process. The Mid Atlantic Ridge shows clear evidence of spurts of magmatic activity which may represent a global phenomenon rather than just a local event. Geological mechanisms suggest the Earth always had a "ring of fire" centered in the Pacific Basin. The hot corona surrounding the sun may be further evidence of gravity waves converting to energy on the surface of a gravity influenced mass.

Key Words:
gravimass, Fraunhofer zone, radiation pressure, Newton's Law, hyperbolic equation, neutrino, Planck's constant, black hole A0620-00/V616 Mon, Monoceros, fixed link, elastic link, plate tectonics, Warren Carey, expanding earth, pair production, bosons, meteorite accumulations, Coulomb's Law, Inverse Square Law, corona heat, corona temperature, sun plasma, solar energy

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1. BACKGROUND

There is some doubt as to the origin and true nature of gravity. Gravity may be a form of energy transferring around the universe, but originating at Black Holes. By inferring this, it suggests a mechanism exists whereby the universe could be regarded as a continuous loop. The loop consists of matter transferring to energy at black hole regions (**M=>E**) and then into gravity waves (**E=>G**). The cycle is complete when elastic energy derived from gravity waves transfers into mass (**G=>M**):

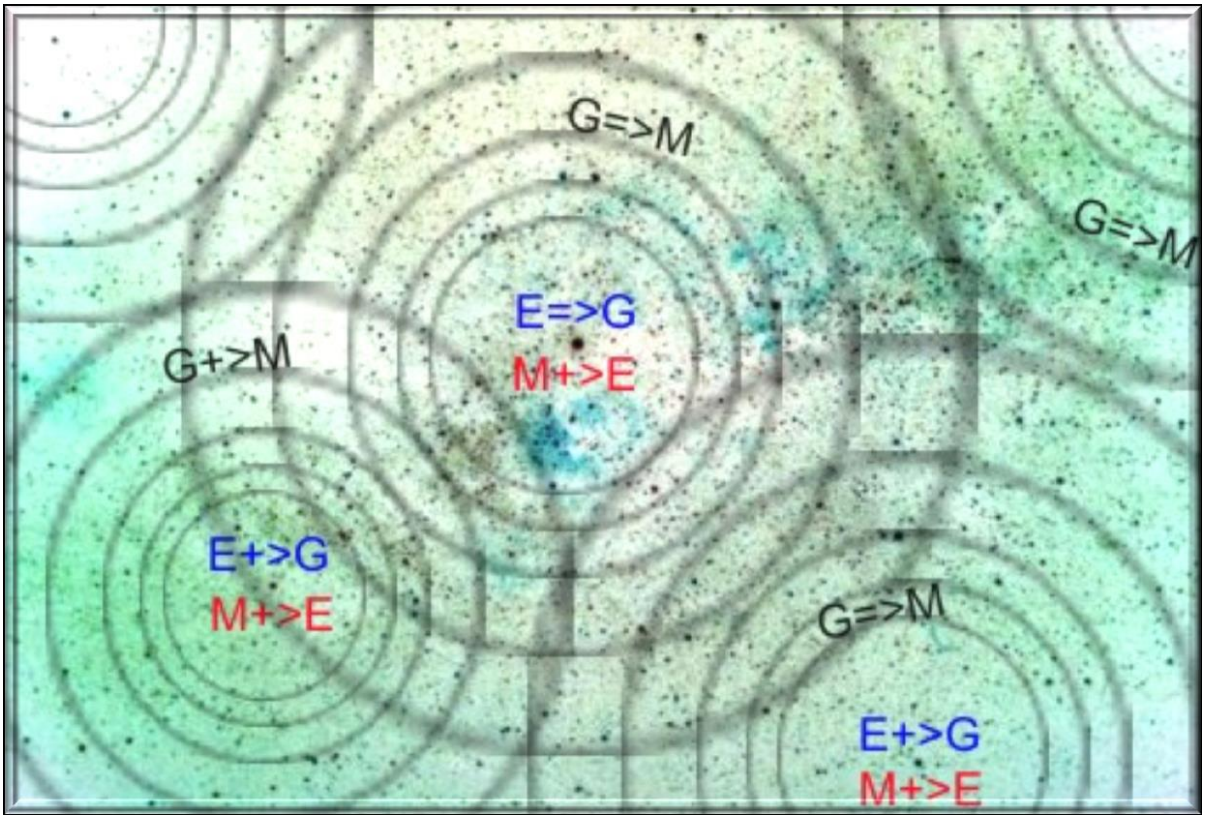


Figure 1.

In the case of the various suns in the universe, accumulating mass immediately adds to their radiant energy flux.

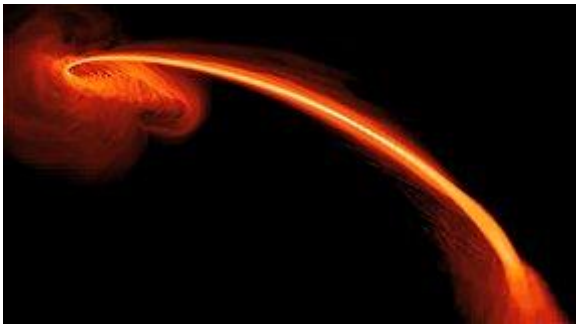
Reference 24

Radiation pressure *is the pressure exerted upon any surface exposed to electromagnetic radiation. If absorbed, the pressure is the power flux density divided by the speed of light. If the radiation is totally reflected, the radiation pressure is doubled. For example, the radiation of the Sun at the Earth has a power flux density of 1,370 W/m^2, so the radiation pressure is 4.6 μPa (absorbed).*

We infer that gravity waves also exert pressure and most notably on surrounding black holes causing them to move apart.

Reference 27

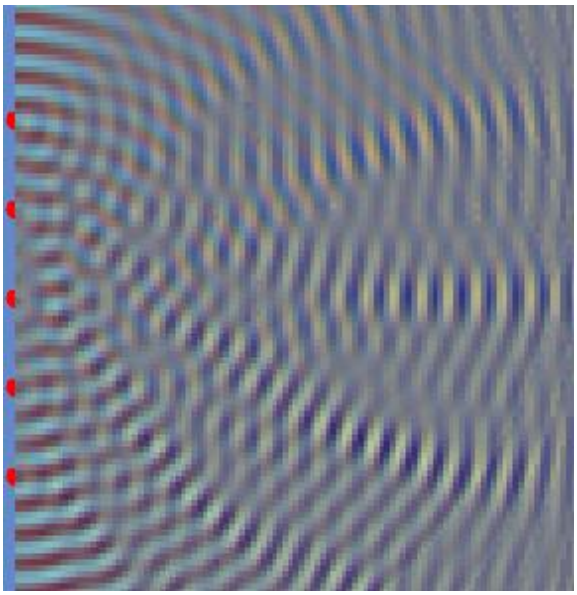
Scientists have witnessed the rare spectacle of a supermassive black hole devouring a star that had ventured too close - an event that occurs about once in 10,000 years.



Reference 28

The sound field is more uniform away from the transducer in the far field, or Fraunhofer zone, where the beam spreads out in a pattern originating from the center of the transducer. It should be noted that even in the far field, it is not a uniform wave front. However, at some distance from the face of the transducer and central to the face of the transducer, a uniform and intense wave field develops.

The wave patterns suggest gravity waves emanating from multiple black holes might cause arms to form around affected galaxies.



INTERIM CONCLUSION: #1

Figure 1 and Reference 27 imply the universal gravitational constant G must vary throughout the universe depending on proximity to the nearest black hole, and Reference 28 shows gravity waves coming from nearby black holes could interact to form clusters of mass materials.

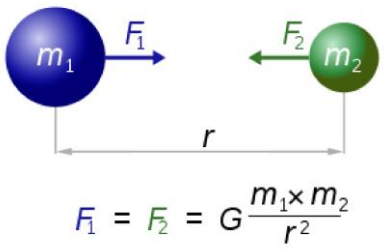
Reference 25 provides a mechanism whereby the interaction of opposing black hole gravity waves might repel each other creating an ever expanding universe.

Approaching the limits of the universe will result in faster rates of expansion because there is reduced or no resistance to expansion from outlying black holes with their associated gravity waves.

2. BLACK HOLE TRANSFORMATION

Reference 1:

*The **gravitational constant**, denoted G, is an empirical physical constant involved in the calculation of the gravitational attraction between objects with mass. It appears in Newton's law of universal gravitation and in Einstein's theory of general relativity. It is also known as the **universal gravitational constant**, **Newton's constant**, and colloquially **Big G**.[1] It should not be confused with "little g" (g), which is the local gravitational field (equivalent to the free-fall acceleration[2]), especially that at the Earth's surface; see Earth's gravity and Standard gravity.*

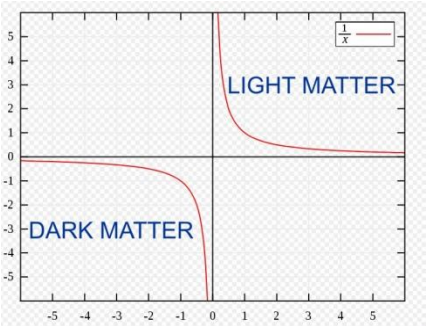


According to the law of universal gravitation, the attractive force (F) between two bodies is proportional to the product of their masses (m_1 and m_2), and inversely proportional to the square of the distance r) between them:

As an object approaches a black hole it experiences huge gravitational pull forces from the densely packed mass of the black hole. This causes the incoming mass to be absorbed into the black hole. Under these circumstances Newton's Law shows that the very large black hole mass at m_1 incrementally increases by absorbing m_2 and the distance r^2 diminishes towards zero. Effectively the attractive force F in the equation becomes unstable as a very large number is divided by a very small number approaching zero.

Reference 2

The function y = 1/x. As x approaches 0 from the right, y approaches infinity. As x approaches 0 from the left, y approaches negative infinity (see asymptote).



This asymptotic figure is described as an equilateral hyperbola. The "Light Matter" and "Dark Matter" labels are speculatively added.

Reference 3

In mathematics, a hyperbolic partial differential equation of order n is a partial differential equation (PDE) that, roughly speaking, has a well-posed initial value problem for the first n−1 derivatives. More precisely, the Cauchy problem can be locally solved for arbitrary initial data along any non-characteristic hypersurface. Many of the equations of mechanics are hyperbolic, and so the study of hyperbolic equations is of substantial contemporary interest. The model hyperbolic equation is the wave equation (where it is beautifully illustrated). *In one spatial dimension, this is*

$$u_{tt} - u_{xx} = 0.$$

The equation has the property that, if u and its first time derivative are arbitrarily specified initial data on the initial line t = 0 (with sufficient smoothness properties), then there exists a solution for all time.

The solutions of hyperbolic equations are "wave-like." If a disturbance is made in the initial data of a hyperbolic differential equation, then not every point of space feels the disturbance at once. Relative to a fixed time coordinate, disturbances have a finite propagation speed. They travel along the characteristics of the equation. This feature qualitatively distinguishes hyperbolic equations from

elliptic partial differential equations and parabolic partial differential equations. A perturbation of the initial (or boundary) data of an elliptic or parabolic equation is felt at once by essentially all points in the domain.

Reference 4

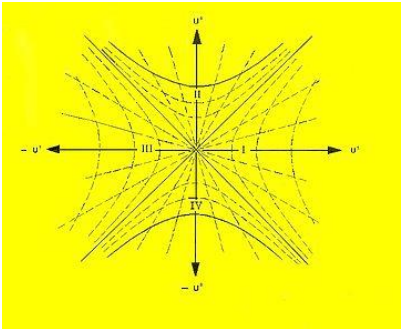
In general relativity Kruskal–Szekeres coordinates, named for Martin Kruskal and George Szekeres, are a coordinate system for the Schwarzschild geometry for a black hole. These coordinates have the advantage that they cover the entire spacetime manifold of the maximally extended Schwarzschild solution and are well-behaved everywhere outside the physical singularity.

And

The maximally extended Schwarzschild geometry can be divided into 4 regions each of which can be covered by a suitable set of Schwarzschild coordinates. The Kruskal–Szekeres coordinates, on the other hand, cover the entire space-time manifold. The four regions are separated by event horizons.

I	*exterior region*	$V^2 - U^2 < 0$ *and* $U > 0$	$2GM < r$
II	*interior black hole*	$0 < V^2 - U^2 < 1$ *and* $V > 0$	$0 < r < 2GM$
III	*parallel exterior region*	$V^2 - U^2 < 0$ *and* $U < 0$	$2GM < r$
IV	*interior white hole*	$0 < V^2 - U^2 < 1$ *and* $V < 0$	$0 < r < 2GM$

The transformation given above between Schwarzschild and Kruskal–Szekeres coordinates applies only in regions I and II. A similar transformation can be written down in the other two regions.



Kruskal-Szekeres diagram showing the four regions bounded by event horizons (solid straight lines at 45 degrees passing through the centre of the diagram), with dotted lines representing curves of constant Schwarzschild r-coordinate (the dotted hyperbolas) and constant Schwarzschild t-coordinate (the dotted straight lines at different angles passing through the centre) drawn in. I and III are the two exterior regions, while II is the black hole interior region (with the two solid 45-degree lines bordering it being the two black hole horizons) and IV is the white hole interior region (with the two solid 45-degree lines bordering it being the two white hole horizons). The solid hyperbola at the top (i.e. the one drawn with a solid line rather than a dashed line) represents the black hole singularity, and the solid hyperbola at the bottom represents the white hole singularity. Note that the creator of this diagram has used a different convention for labelling the Kruskal-Szekeres radial and time coordinates.

The descriptive sentence from Reference 3, "*The solutions of hyperbolic equations are "wave-like." If a disturbance is made in the initial data of a hyperbolic differential equation, then not every point of space feels the disturbance at once"* highlights a peculiarity with hyperbolic results which points to the prospects of transforming matter entering a black hole into wave energy forms. However, if these wave forms have anything to do with gravity they will need to embody some basic properties including:

- Be invisible
- Be electrically neutral
- Be all pervasive
- Seamlessly convert to mass

This description generally coincides with that of neutrino particles.

Reference 5

*A **neutrino** (English pronunciation: /njuːˈtriːnoʊ/,Italian pronunciation: [neuˈtriːno]), meaning "small neutral one", is an elementary particle that usually travels close to the speed of light, is electrically neutral, and is able to pass through ordinary matter almost unaffected, "like a bullet passing through a bank of fog"[1]. This makes neutrinos extremely difficult to detect. Neutrinos have a very small, but nonzero mass. They are denoted by the Greek letter ν (nu).*

Neutrinos are similar to the more familiar electron, with one crucial difference: neutrinos do not carry electric charge. Because neutrinos are electrically neutral, they are not affected by the electromagnetic forces which act on electrons. Neutrinos are affected only by a "weak" sub-atomic force of much shorter range than electromagnetism, and are therefore able to pass through great distances within matter without being affected by it. Neutrinos also interact gravitationally with other particles.

Neutrinos are created as a result of certain types of radioactive decay or nuclear reactions such as those that take place in the Sun, in nuclear reactors, or when cosmic rays hit atoms. There are three types, or "flavours", of neutrinos: electron neutrinos, muon neutrinos and tau neutrinos. Each type also has a corresponding antiparticle, called an antineutrino. Electron neutrinos (or antineutrinos) are generated whenever protons change into neutrons, or vice versa—the two forms of beta decay. Interactions involving neutrinos are mediated by the weak interaction.

And at **Reference 6**

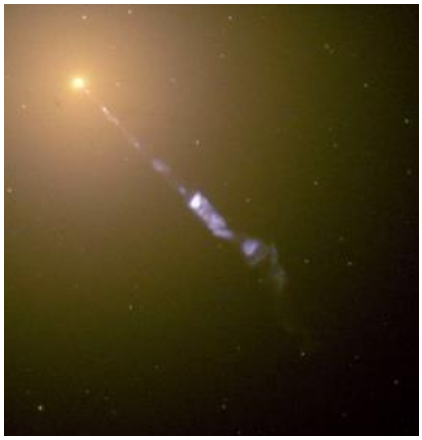
Neutrinos are one of the fundamental particles which make up the universe. They are also one of the least understood.

--Neutrinos are affected only by a "weak" sub-atomic force of much shorter range than electromagnetism, and are therefore able to pass through great distances in matter without being affected by it. If neutrinos have mass, they also interact gravitationally with other massive particles, but gravity is by far the weakest of the four known forces.

Three types of neutrinos are known; there is strong evidence that no additional neutrinos exist, unless their properties are unexpectedly very different from the known types. Each type or "flavour" of neutrino is related to a charged particle (which gives the corresponding neutrino its name). Hence, the "electron neutrino" is associated with the electron, and two other neutrinos are associated with heavier versions of the electron called the muon and the tau. The table below lists the known types of neutrinos (and their electrically charged partners).

Neutrino		n_e		n_m		n_t
Charged Partner		*electron (e)*		*muon (m)*		*tau (t)*

Reference 25:



A visible light image of the giant elliptical galaxy M87, taken with NASA Hubble Space Telescope's Wide Field Planetary Camera 2 in February 1998, reveals a brilliant jet of high-speed electrons emitted from the nucleus (diagonal line across image). The jet is produced by a 3-billion-solar-mass black hole. Image credit: NASA

INTERIM CONCLUSION: #2

The three neutrino flavors n_e n_m n_t together with the original mass consumed by the black hole provide four ingredients which have an interesting parallel with the four regions identified in the Kruskal–Szekeres coordinates (Reference 4) exterior *region, interior black hole, parallel exterior region, interior white hole* with mass equating to the *exterior region* and the neutrino flavors equating to the other three regions.

Reference 23

*The **Planck constant** (denoted **h**), also called **Planck's constant**, is a physical constant reflecting the sizes of energy quanta in quantum mechanics. It is named after Max Planck, one of the founders of quantum theory, who discovered it in 1900. Classical statistical mechanics requires the existence of h (but does not define its value).*[2]

*The Planck constant was first described as the proportionality constant between the energy (E) of a photon and the frequency (ν) of its associated electromagnetic wave. This relation between the energy and frequency is called the **Planck relation** or the **Planck–Einstein equation**:*

$$E = h\nu\,.$$

Since the frequency ν, wavelength λ, and speed of light c are related by λν = c, the Planck relation can also be expressed as

$$E = \frac{hc}{\lambda}.$$

In 1923, Louis de Broglie generalized this relation by postulating that the Planck constant represents the proportionality between the momentum and the quantum wavelength of not just the photon, but any particle. This was confirmed by experiments soon afterwards.

Planck discovered that physical action could not take on any indiscriminate value. Instead, the action must be some multiple of a very small quantity (later to be named the "quantum of action" and now called Planck's constant). This inherent granularity is counterintuitive in the everyday world, where it is possible to "make things a little bit hotter" or "move things a little bit faster". This is because the quanta of action are very, very small in comparison to everyday human experience. Thus, on the macro scale quantum mechanics and classical physics converge. Nevertheless, it is impossible, as Planck found out, to explain some phenomena without accepting that action is quantized. In many cases, such as for monochromatic light or for atoms, the quantum of action also implies that only certain energy levels are allowed, and values in between are forbidden.[3]

INTERIM CONCLUSION: #3

Material entering a black hole region is expected to follow a hyperbolic path which asymptotes towards plus and minus event horizons. As it approaches an horizon it encounters the Plank Constant which prevents it getting any closer. Thereupon the material undergoes a series of phase changes. Initially electrons are stripped from the outer shells thereby severing the electro static force holding them to their protons. This force transformation probably manifests in the creation of gravity waves which sustain the black hole structure. With electrons stripped from the atoms, it is possible for the remaining protons and neutrons to progress further down the hyperbolic curve until they too encounter the Plank Constant and undergo a phase change. These transformations progressively enable all atomic particles to cross over the hyperbolic curve axis and appear in modified form on the matching hyperbola as shown in Reference 4. The result is the emergence of a suit of neutrino particles together with gravity waves.

3. GRAVITATIONAL AND ELECTROMAGNETIC FORCES

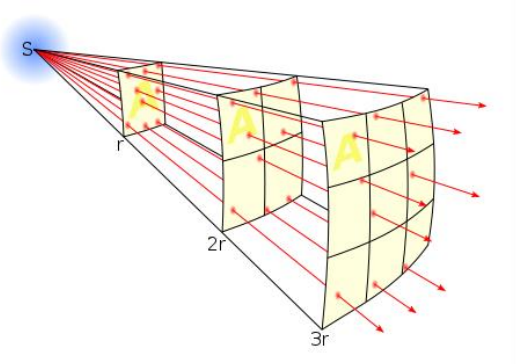
Reference 1:

The gravitational force is extremely weak compared with other fundamental forces. ***For example, the gravitational force between an electron and proton one meter apart is approximately 10^{-67} newtons, while the electromagnetic force between the same two particles is approximately 10^{-28} newtons.*** *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 thirty nine orders of magnitude (i.e., 10^{39}) greater than the force of gravity — roughly the same ratio as the mass of the Sun compared to a microgram mass.*

Reference 28:

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. In equation form:*

$$\text{Intensity} \propto \frac{1}{\text{distance}^2}$$



The divergence of a vector field which is the resultant of radial inverse-square law fields with respect to one or more sources is everywhere proportional to the strength of the local sources, and hence zero outside sources. Newton's law of universal gravitation follows an inverse-square law, as do the effects of electric, magnetic, light, sound, and radiation phenomena.

If we assume gravity waves follow the Inverse Square Law and that gravity is initiated at Black Holes where electrons are stripped from their nuclei, we can calculate how far away the source is for Earth's gravity waves:-

Using information from reference 28, we calculate in Table 1.

Gravitational force Fg	N	1E-067
Electromagnetic force Fe	N	1E-028
One light year is	m	9,460,528,400,000,000
Assume Fg increases with distance squared and d1 is 1m.		
Inverse square law gives d2	m	31,622,776,601,683,800,000
Light year equivalent is	ly	3,343

Table 1.

Reference 29:

Our Milky Way galaxy contains several stellar-mass Black Hole Candidates (BHCs) which are closer to us than the supermassive black hole in the Galactic center region. These candidates are all members of X-ray binary systems in which the compact object draws matter from its partner via an accretion disk. The probable black holes in these pairs range from three to more than a dozen solar masses.[9][10][11]

Name	*BHC Mass (solar masses)*	*Companion Mass (solar masses)*	*Orbital period (days)*	*Distance from Earth (light years)*	*Location* [12]
A0620-00/V616 Mon	*11 ± 2*	*2.6–2.8*	*0.33*	*about 3500*	*06:22:44 -00:20:45*
GRO J1655-40/V1033 Sco	*6.3 ± 0.3*	*2.6–2.8*	*2.8*	*5000−11000*	*16:54:00 -39:50:45*
XTE J1118+480/KV UMa	*6.8 ± 0.4*	*6−6.5*	*0.17*	*6200*	*11:18:11 +48:02:13*
Cyg X-1	*11 ± 2*	*≥18*	*5.6*	*6000–8000*	*19:58:22 +35:12:06*
GRO J0422+32/V518 Per	*4 ± 1*	*1.1*	*0.21*	*about 8500*	*04:21:43 +32:54:27*
GS 2000+25/QZ Vul	*7.5 ± 0.3*	*4.9–5.1*	*0.35*	*about 8800*	*20:02:50 +25:14:11*
V404 Cyg	*12 ± 2*	*6.0*	*6.5*	*about 10000*	*20:24:04 +33:52:03*
GX 339-4/V821 Ara		*5–6*	*1.75*	*about 15000*	*17:02:50 -48:47:23*
GRS 1124-683/GU Mus	*7.0 ± 0.6*		*0.43*	*about 17000*	*11:26:27 -68:40:32*
XTE J1550-564/V381 Nor	*9.6 ± 1.2*	*6.0–7.5*	*1.5*	*about 17000*	*15:50:59 -56:28:36*
4U 1543-475/IL Lupi	*9.4 ± 1.0*	*0.25*	*1.1*	*about 24000*	*15:47:09 -47:40:10*
XTE J1819-254/V4641 Sgr	*7.1 ± 0.3*	*5–8*	*2.82*	*24000 – 40000*[13]	*18:19:22 -25:24:25*
GRS 1915+105/V1487 Aql	*14 ± 4.0*	*~1*	*33.5*	*about 40000*	*19:15;12 +10:56:44*
XTE J1650-500	*9.7 ± 1.6* [14]	.	*0.32*[15]		*16:50:01 -49:57:45*

Table 2.

Table 2 shows the nearest Black Hole is_A0620-00 at about 3,500 light years from Earth which lies within the margin of error to the calculated inverse square distance of 3,343 light years.

This information can be summerised graphically by converting coordinates from Spherical to Cartesian and plotting the distance as Light Years divided by 100. The Black Holes are sized in proportion to their solar masses. Refer Figure 2.

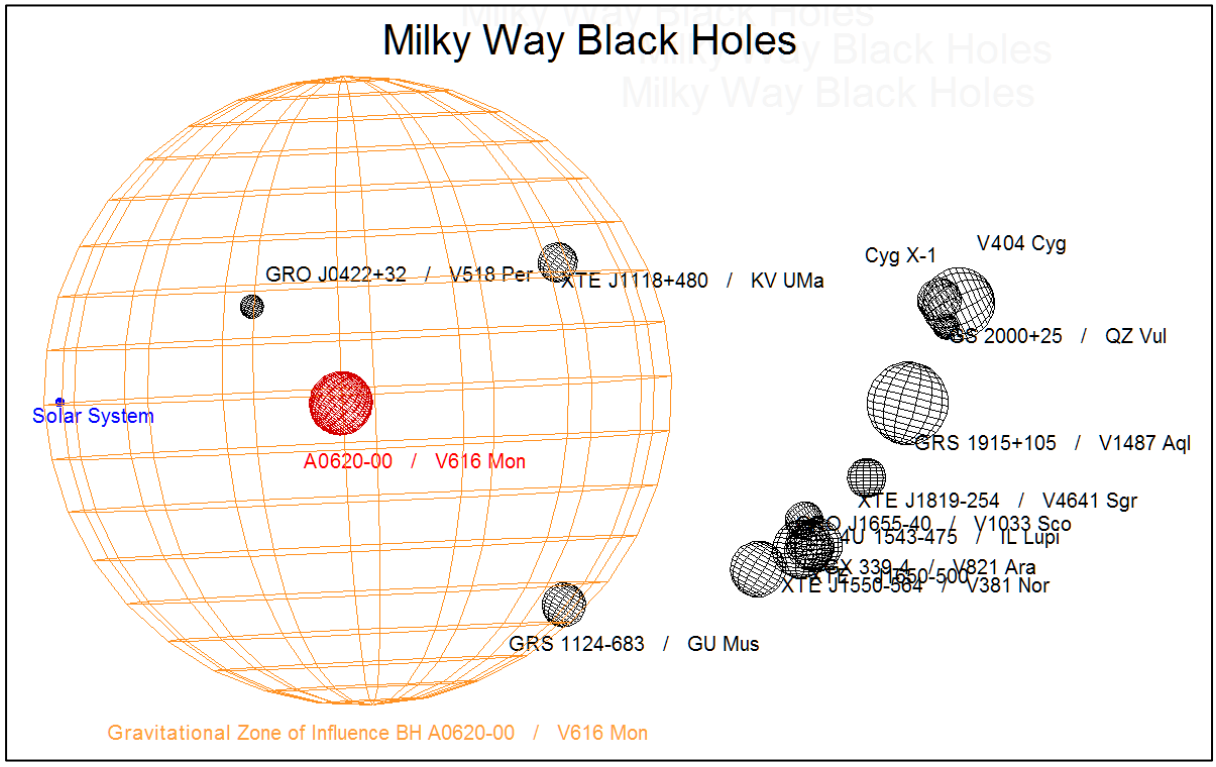


Figure 2.

Black Hole AO620-00/V616Mon (V616) lies in the constellation Monoceros, see Figures 3 and 4:

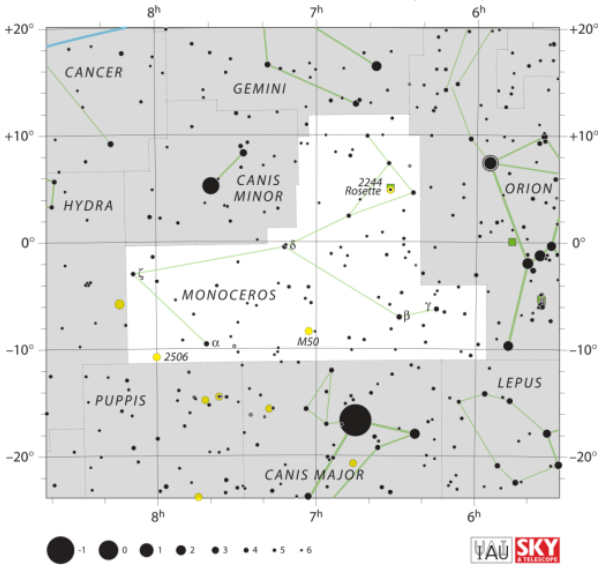


Figure 3

Figure 4

INTERIM CONCLUSION: #4

The nearest significant black hole to Earth is at a range which concurs with the calculated inverse square distance adding weight to the theory that gravity waves form at black holes.

4. ELASTIC ENERGY CONVERSION TO MASS

Consider a crane suspending a load above the ground with the winch brake engaged. The load is not moving, so there is no work being done, even though the force of gravity is acting on the suspended load. Now consider the winch brake is released, but the electric motor driving the winch is powered sufficiently to stall the motor, and hold the load suspended above the ground. Still no work is being performed on the load, but the winch is consuming power, which is converted into heat. The difference in these two situations is that the crane with the brake applied represents a **FIXED LINK** with the load, while the stalled motor alternative represents an **ELASTIC LINK** with the load.

An elastic link can be compared to a spring balance where the extended spring stores energy in the torsional stress of the spring coils and then is free to release that stress when the spring returns to normal.

Similarly, the force of gravity represents an elastic link between the Sun and the Earth during sidereal rotation. In the process of following this elliptical path there is no immediately apparent mechanism for storing and then releasing energy. However, we can assume that the force of gravity is responsible for returning the Earth from its furthest point of apogee to the point of perigee, which expends energy. Once there the Earth will consume more energy in moving away from the Sun under the influence of centrifugal force. This energy appears to be stored as additional mass on the Earth.

Earth's orbit is not circular; it has an elastic radius, and varies from a minimal distance of 1.471E+011 to a maximum of 1.521E+011 meters from the Sun. This is a variation of 5 billion meters each year, or 1.0E+010 m both ways (L).

The force of gravity (F) acting to hold the Earth in orbit around the Sun is calculated from Newton's equation, as discussed previously

$$F = G\frac{m_1 m_2}{r^2}$$

Where (m_1) and (m_2) are the Sun and Earth masses, (G) is the gravitational constant and (r) is the radial distance between the two bodies. We can calculate that F is currently equal to 3.564E+022 Newton, but would have been less with a reduced Earth mass in the Paleozoic.

Now, if we accept that the elastic nature of the link between the two bodies suggests work is being done, we can calculate that during one orbit the force F acts through a distance of L, and the work is 3.098E+032 N.m. The units for Work (N.m.) and joules of Energy (J) have the same value, so we can say this also represents the amount of energy involved. In the crane example the energy consumed, transpired as heat. We recognize that our current understanding of gravity is very basic, but let us assume that gravity represents a convertible form of energy, and that energy may also report as new mass rather than heat. We can then use Einstein's relativity formula (E=mc2) to calculate the mass generated.

The quantity of mass produced is 3.447E+015 Kg per annum (212,245tpa), which over 280 My comes to 1.755E+020 m^3 (Earth SG 5500 kg/m^3). The Paleozoic surface area would have been 4.545E+008

Km^2, while the existing surface is 5.111E+008 Km^2, an increase of 12.5%. Since the Earth has always been orbiting the Sun, this effect should have existed for the previous 4.55By. When we make allowance for the growing Earth mass during this time, we find the Earth started off with a surface area of 3.188E+008 Km^2, an increase of 60% over its lifetime.

5. CORROBORATING GEOLOGICAL EVIDENCE

Reference 7

Expanding Earth or Growing Earth *is a hypothesis asserting that the position and relative movement of continents is at least partially due to the volume of the Earth increasing.*

While suggested historically, since the recognition of plate tectonics in the 1970s, the scientific consensus has rejected any expansion of the Earth.

There are various forms of the expanding earth hypothesis.

1. *Earth's mass has remained constant, and thus the gravitational pull at the surface has decreased over time;*
2. *Earth's mass has grown with the volume in such a way that the surface gravity has remained constant;*
3. *Earth's gravity at its surface has increased over time, in line with its hypothesized growing mass and volume;*
4. *Whole-earth decompression dynamics was proposed by J. Marvin Herndon who postulates Earth formation from a Jupiter sized gas giant by catastrophic loss of its gaseous atmosphere with subsequent decompression and expansion of the rocky remnant planet resulting in decompression cracks at continental margins which are filled in by basalts from mid-ocean ridges.*[1]

Many of the remaining expanding Earth adherents have been inspired by the ideas of the late Australian geologist S. Warren Carey, who suggested expansion in the 1950s and 60s - prior to the development of tectonics.[2] Not correct as discussed at plate tectonics, Warren Carey was well aware of plate tectonics.

And

Scientific consensus

Generally, the scientific community finds no evidence to support the expansion of the Earth theory, and uses the following arguments to dismiss it:

- *Measurements with modern high-precision geodetic techniques show that the Earth is not currently increasing in size to within a measurement accuracy of 0.2 mm·y^{-1}.*[18] *Furthermore, the motions of tectonic plates and subduction zones measured by a large range of geological, geodetic and geophysical techniques supports plate tectonics.*[15][20][21] This derives from

  Reference 20 which states: *Here, we use multiple precise geodetic data sets and a simultaneous global estimation platform to determine that the ITRF2008 origin is consistent with the mean CM at the level of 0.5 mm yr−1, and the mean radius of the Earth is not changing to within 1σ measurement uncertainty of 0.2 mm yr−1.* This implies the radius could increase by up to 0.245 mm/y and still remain within the 0.5 mm/y CM (center of mass) level as measured.

- *Mass accretion on a scale required to change the Earth's radius is contradicted by the current accretion rate of the Earth, and by the Earth's average internal temperature: any accretion releases a lot of energy, which would warm the planet's interior. Expanding Earth models based on thermal expansion contradict most modern principles from rheology, and fail to provide an acceptable explanation for the proposed melting and phase transitions.*
- *Paleomagnetic data has been used to calculate that the radius of the Earth 400 million years ago was 102 ± 2.8% of today's radius.*[22][23]
- *Examinations of data from the Paleozoic and Earth's moment of inertia suggest that there has been no significant change of earth's radius in the last 620 million years.*[24]

[edit] Present day advocates

One prominent present day advocate of an expanding Earth is comics (Graphics) artist Neal Adams, who calls his ideas "Growing Earth Theory".[25] Adams has made video animations that graphically illustrate his hypothesis, in which new mass is created by a hypothesized electron/positron pair production process within the core of the Earth.[26]

Neal Adams has compiled sophisticated graphic simulations to support his Growing Earth Theory at;

Reference 8 His supporting comments include:

- *The earth has two crusts. One…the mostly basalt lower crust or the oceanic crust which is 2 – 4 miles deeper down than the higher upper continental crust. This lower crust essentially covers the Earth. It … this crust is being made daily at rift cracks that snake around the earth's mid- oceans. But how could all these rifts continually spread apart…without the Earth growing?*
- *Sitting on or "in" and "as part of" the oceanic crust is the second higher upper crust or the Continental Crust rising for the most part out of the water. It is made mostly of granitic rock, which is 2.5 times the weight of water.*
- *At a given distance out into the ocean the ocean floor suddenly drops off and goes down like a plummet… 2 ½ to 4 miles to the deep ocean floor, where we find the second lower crust, the Oceanic Crust made mostly of basalts which are 3.0 – 3.3 times the weight of water. -- The other side of that broken off ridge is across the ocean thousands of miles in Europe, or Africa and west to Australia and Asia. How did the two sides of this higher crust spread apart?*
- *We … I … argue that, that this outer crust originally covered the whole of a smaller Earth and the Earth sphere grew. The outer crust, therefore, had to crack and spread to accommodate a growing Earth…which…it apparently did.*
- *We further argue that if you were to shrink the sphere of Earth … by letting the oceanic plate re-enter the rifts they erupted from, over time … the continental crust would easily and completely fit back together.*
- *Added together these continental upper plate areas cover only between one third to one quarter of the Earth. Where is the rest of the outer crust? Three quarters of it seems to be missing. It has to be somewhere, This much stuff can't disappear. If we got it back it would give us four times the continental surface and mass than we have now!*
- *An aside….you may fairly ask how this matter can be created. It's created at the plasma core of all planets, moons, and suns by a process that is so common that science has a name for it, "pair production!" It's how all matter is made from energy.*
- *If you settle South America to Africa, in the north there is a 25 degree split between the two. They do not fit! If you try to fit downward coasts, there is a 25 degree split at the top. There is only one way these two continents will fit together properly. If you make a globe 50% smaller … and re-curve these two continents on to that globe… They fit perfectly!*
- *Both Antarctica and South America have tails that pulled apart from under Africa.*
- *Let's get the rules straight: Continents don't move. Only the Oceanic Plate that they sit in, moves!*

It is unlikely that suns will expand as new born mass material will immediately report as radiant energy.

Reference 30:
The reference suggests the radiant energy is concentrated in the corona region of the sun:++

The sun's surface is blisteringly hot at 10,340 degrees Fahrenheit -- but its atmosphere is another 300 times hotter. This has led to an enduring mystery for those who study the sun: What heats the atmosphere to such extreme temperatures? Normally when you move away from a hot source the environment gets cooler, but some mechanism is clearly at work in the solar atmosphere, the corona, to bring the temperatures up so high.

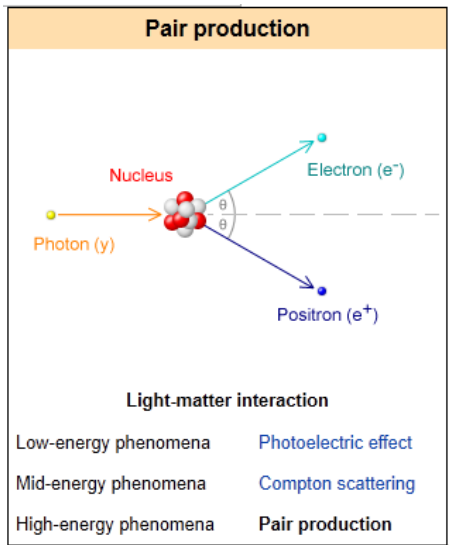
Further information suggesting general orbiting body expansions comes from NASA in their report:

Reference 26:

A new study indicates the Moon may not be as geologically dead as previously thought, showing signs that it is simultaneously stretching and shrinking. New high-resolution images from NASA's Lunar Reconnaissance Orbiter, show parts of the Moon's surface are being pulled apart by expansion, forming small narrow trenches or rift valleys in the mare basalts and the highlands of the Lunar far side.

6. PAIR PRODUCTION

Reference 9



Pair production *refers to the creation of an elementary particle and its antiparticle, usually from a photon (or another neutral boson). For example an electron and its antiparticle, the positron, may be created. This is allowed, provided there is enough energy available to create the pair – at least the total rest mass energy of the two particles – and that the situation allows both energy and momentum to be conserved. Other pairs produced could be a muon and anti-muon or a tau and anti-tau. However all other conserved quantum numbers (angular momentum, electric charge, lepton number) of the produced particles must sum to zero—thus the created particles shall have opposite values of each. For instance, if one particle has electric charge of +1 the other must have electric charge −1, or if one particle has strangeness +1 then another one must have strangeness −1.*

Reference 10

Matter creation *is the process inverse to particle annihilation. It is the conversion of massless particles into one or more massive particles. This process is the time reversal of annihilation. Since all known massless particles are bosons and the most familiar massive particles are fermions, usually what is considered is the process which converts two bosons (e.g. photons) into two fermions (e.g., an electron-positron pair).*

INTERIM CONCLUSION: #5

Unsurprisingly, neither of these references categorically explain how mass can be created from gravity waves, but does describe how massless particles (bosons) can change to massive particles. However, Reference 2, (*This asymptotic figure is described as an equilateral hyperbola and the "Light Matter" and "Dark Matter" labels as speculatively added.***) Reference 3 (***The solutions of hyperbolic equations are "wave-like." If a disturbance is made in the initial data of a hyperbolic differential equation, then not every point of space feels the disturbance at once. Relative to a fixed time coordinate, disturbances have a finite propagation speed. They travel along the characteristics of the equation.***), Reference 4 (***The Kruskal–Szekeres coordinates, on the other hand, cover the entire space-time manifold. The four regions are separated by event horizons.***), Reference 5 (***Because neutrinos are electrically neutral, they are not affected by the electromagnetic forces which act on electrons. Neutrinos are affected only by a "weak" sub-atomic force of much shorter range than electromagnetism, and are therefore able to pass through great distances within matter without being affected by it. Neutrinos also interact gravitationally with other particles.***) and Reference 9 (*****Pair production*** *refers to the creation of an elementary particle and its antiparticle, usually from a photon (or another neutral boson).*) These discussions leave the possibility that the action of mass consumption in Black Holes may be reversible. It is assumed this to be the case in the following discussion and will be described as GRAVIMASS.**

7. DEDUCTIONS

Paragraph 3 suggests the Earth had 60% less surface area originally, which equates to a reduced diameter of 77.5%

Neal Adams suggests the diameter was 50% smaller originally.

On an annualised basis over 4.5by Adam's figure requires an increase of 0.23 mm/year.

Reference 11

GEOPHYSICAL RESEARCH LETTERS, VOL. 38, L13304, 5 PP., 2011
doi:10.1029/2011GL047450

Accuracy of the International Terrestrial Reference Frame origin and Earth expansion

Key Points

- *ITRF2008 origin drift from the mean CM is less than 0.5 mm/yr*
- *The solid Earth is not expanding within the measurement accuracy of 0.2 mm/yr*
- *These are determined using multiple data sets and a global inverse platform*

Other points listed under "scientific consensus" in Paragraph 4 rely on assuming the Gravimass (Gm) addition has similar properties to other mass. It seems possible that Gm has no initial mass but will take on the properties of the seed mass it grows on, because Gm only has relativity to it's seed mass. Under these circumstances the revised mass will increase, but not involve accretion temperature considerations, or body inertial changes.

Using the ITRF 0.2 mm/yr limit of accuracy measurement, Earth could have had an initial radius of up to 5477 Km, or 86% of the existing radius.

The original surface area would have been 376.96×10^6 km^2 which is 134×10^6 km^2 less than the present value of 511.1×10^6 km^2

However, expansion on Earth may not be a liner process. The Mid Atlantic Ridge shows clear evidence of spurts of magmatic activity which may represent a global phenomenon rather than just a local event.

8. THERMAL CONSIDERATIONS

It is widely accepted that Earth was much hotter previously and the surface was molten.

Reference 12

Lava *refers both to molten rock expelled by a volcano during an eruption and the resulting rock after solidification and cooling. This molten rock is formed in the interior of some planets, including Earth, and some of their satellites. When first erupted from a volcanic vent, lava is a liquid at temperatures from 700 °C to 1,200 °C (1,300 °F to 2,200 °F).*

Large regions of Earth are composed of submarine basalt rocks with a surface temperature about 2°C. The temperature of these rocks has lowered in the order of 1000°C. Core nuclear activity is also reduced, so we will assume Earth sub crustal mass had a similar drop in temperature.

Reference 13

The change in dimension—linear or volumetric—of a rock specimen with temperature is expressed in terms of a coefficient of thermal expansion. This is given as the ratio of dimension change (e.g., change in volume) to the original dimension (volume, V) per unit of temperature (T) change:

$$\frac{1}{V}\frac{\Delta V}{\Delta T}.$$

Most rocks have a volume-expansion coefficient in the range of 15–33 × 10^{-6} per degree Celsius under ordinary conditions. Quartz-rich rocks have relatively high values because of the higher volume expansion coefficient of quartz. Thermal-expansion coefficients increase with temperature. Table 41 lists some linear-expansion coefficients,

Thermal expansion of rocks

rock type	*linear-expansion coefficient (in 10^{-6} per degree Celsius)*
granite and rhyolite	*8 ± 3*
andesite and diorite	*7 ± 2*
basalt, gabbro, and diabase	*5.4 ± 1*
Sandstone	*10 ± 2*
Limestone	*8 ± 4*
Marble	*7 ± 2*
Slate	*9 ± 1*

The lineal thermal expansion figure 5.4x10^{-6}/°C will be accepted, and shows the surface area was 502.8 x 10^6 km^2 compared to 511.1 x 10^6 km^2 existing, a reduction of 8.3 x 10^6 km^2

The original sub crust surface area discussed under Paragraph 6 would reduce from 377 x 10^6 km^2 to 369 x 10^6 km^2.

Reference 14

Consisting mostly of granitic rock, continental crust has a density of about 2.7g/cm^3 and is less dense than the material of the Earth's mantle, which consists of mafic rock. Continental crust is also less dense than oceanic crust (density of about 3.3g/cm^3), though it is considerably thicker; mostly 25 to 70 km versus the average oceanic thickness of around 7–10 km. About 40% of the Earth's surface is now underlain by continental crust. [1] Continental crust makes up about 70% of the volume of Earth's crust. [2]

Forty percent of Earth's crust equals an area of 204.4 x 10^6 km^2, which would have been much less influenced by thermal contraction considerations. We will assume -500^oC is applicable.

9. METEORITE ACCUMULATIONS

It is reported that on average around 1000 tonne of meteoritic material arrives on Earth each year. This amounts to 4.5 x 10^{12} t since Earth formed, or 0.1% of Earth mass and is too small a quantity to influence current considerations.

INTERIM CONCLUSION: #6

It is not possible for Earth's Sialic Crust to have ever completely covered the surface. There was always a Sima level present in either a molten or solid form.

Thermal contraction considerations add credence to the Expanding Earth theory as the cooling Earth is now around 2% smaller than when lava commonly flowed across the surface.

The level of measurement accuracy available from the ITRF is insufficient to deny the expanding earth theory, but it does limit the magnitude of possible expansion.

ITRF readings do not consider Thermal Expansion and could therefore be interpreted to show the Earth may have been 2% less than the 86% indicated at 84%, or a radius of 5397 km.

Expansion on Earth may not be a liner process. The Mid Atlantic Ridge shows clear evidence of spurts of magmatic activity which may represent a global phenomenon rather than just a local event.

Gravimass is unlikely to influence inertial or accretion temperature considerations.

10. REVISED EARTH MODEL

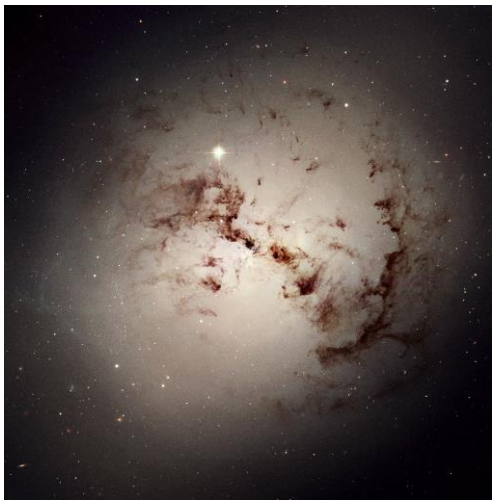
My book, **Planets Satellites and Landforms** (PLS) ISBN 1875401628 (1997) includes aspects pertinent to the current topic.

Reference 15 PLS develops an Earth model assuming a non-impact accretion origin, sic Pierre-Simon Laplace. It suggests the planets formed from a dust cloud illustrative of the Black Widow Nebula in the constellation Circinus.

This and other strong evidence from the Hubble telescope infers that our solar system started off as a very cold (1-2^{o} Kelvin) dust cloud with the particles having substantially radiating velocities. Under these circumstances Coulomb's Law of attraction is likely to be more formative than Newton's Law of Gravitation as it better addresses the tyranny of distance.

Assuming the proto dust cloud encountered a burst of radiation emanating from a remote place in the universe, which had the effect of inducing a high electric potential into parts of the dust cloud. 99.8% of dust particles then adhere to form a web which collapses under the influence of gravity forming the Sun. The “dust bunny” comment supports this proposal

Reference 16



Like dust bunnies that lurk in corners and under beds, surprisingly complex loops and blobs of cosmic dust lie hidden in the giant elliptical galaxy NGC 1316. This image made from data obtained with the NASA/ESA Hubble Space Telescope reveals the dust lanes and star clusters of this giant galaxy that give evidence that it was formed from a past merger of two gas-rich galaxies.

Sufficient mass is present and the heat of collapse and fusion induces solar ignition. Sunspots appear which are important features on the Sun today and which are associated with solar flares and coronal discharge.

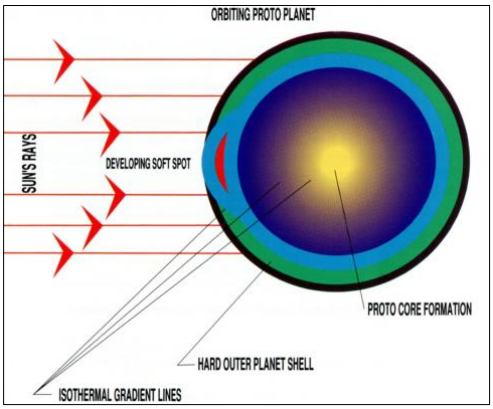
Reference 21

Shows a variety of Hubble images over time illustrating how a cloud is subject to gravitational collapse. Presumably material which does not accrete to the central sun location breaks up into a series of cold homogeneous planets rotating in tidal lock with the developing central Sun.

The homogeneous components of planets include radioactive elements as well as other gases, metals and elements.

Nuclear fission processes decay exothermically and heat gradually builds from the center of the planet, adding to the heat of collapse. Melting occurs followed by gravity separation of the heavy and light elements and compounds.

As the Sun heats the planet's locked facing surface, a zone of weakness appears aligned with the Sun.



Eventually the surface ruptures. Pent-up volatiles and molten rock spew from the vent.

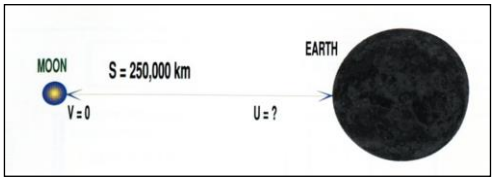
The ruptured surface blasts into space where it may enter its own solar orbit, spiral into the Sun, or return to orbit the planet.

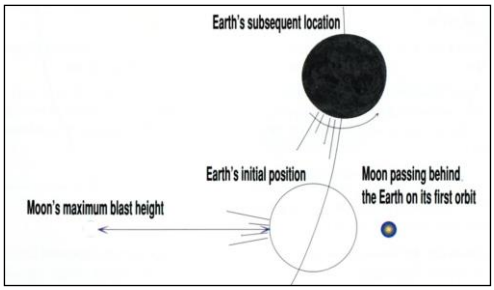
Satellite generation may continue as the vent rotates providing a wide range of satellite launch possibilities.

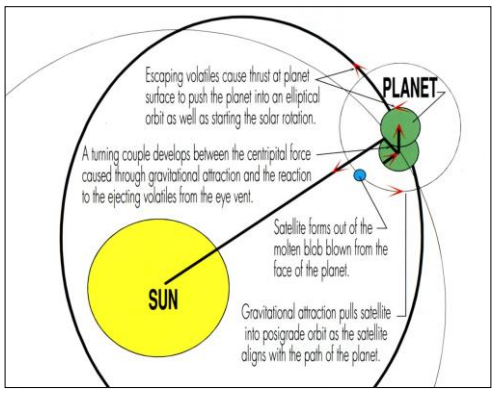
Reference 22

This discussion is limited to the Moon launch. The Moon has insufficient velocity to enter a solar orbit; it slows and starts to return to Earth. However, Earth has moved forward in its orbit around the Sun and the Moon passes behind the Earth. Here it continues to circle the Earth in a prograde orbit direction.

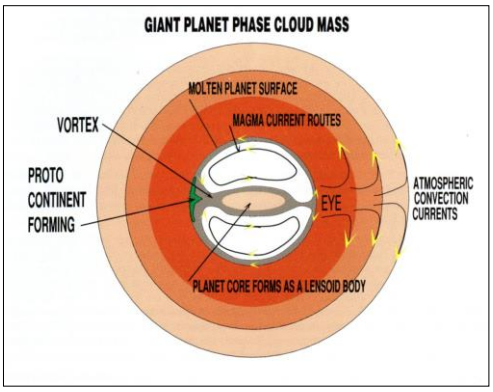
Also included is a sequence which involves a turning couple imparting solar rotation to the planet.



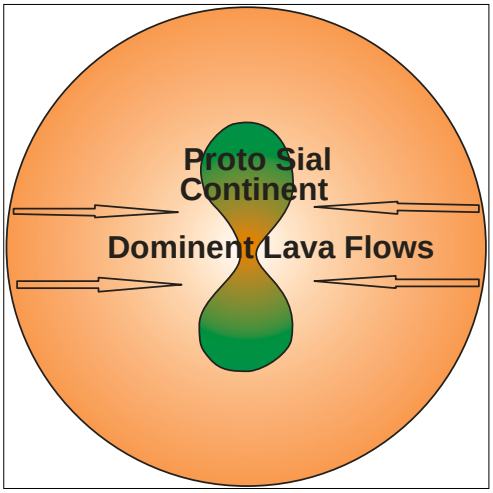




Following the Moon launch, the Earth enters a giant planet stage where hot volatile materials form a dense cloud orbiting the Earth and molten magma continues to erupt from the vent hole. The molten surface eventually engulfs the entire surface. Magma flow circumnavigates the globe preferentially along the equatorial surface both to the east and west. When the flows meet on the remote side, they form an eddy pool and the dense material returns to the Earth's interior in an elutriating process.



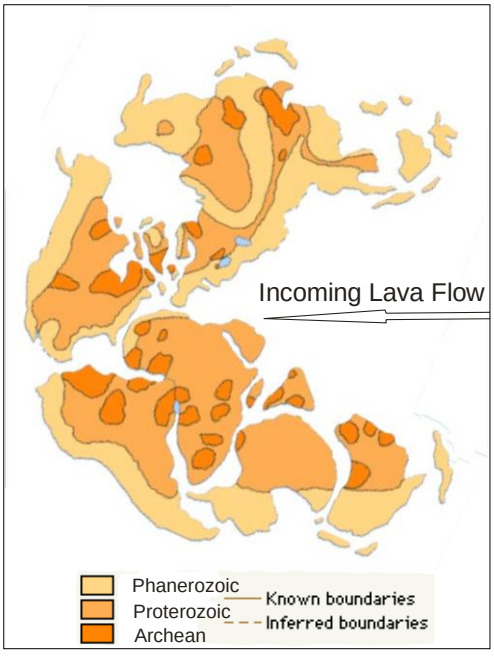
The lighter material (Sialic Crust) forming above the eddy current gradually builds to form a "dumbbell" shaped Archean proto continent which grows in area as well as height.



After **Reference 17**

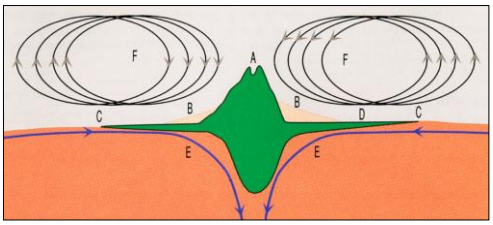
Caption: Archean regions within Proterozoic cratons surrounded by Phanerozoic mobile belts. This distribution is shown here on a Permian predrift map of the continents.

This figure is rotated ~45° anticlockwise to align with lava inflow direction which is thought to be equatorial.



The elevated proto continent is partly supported by the high pressure and density of the Giant Gas Cloud surrounding Earth, enabling very high land forms to develop. Strong westerly winds shape the wings of the continent to the east either side of the incoming lava flow. The asymmetric mass loading possibly gave rise to the processing component currently present in Earth's rotation.

Eventually the proto continent attains sufficient height to present a significant barrier to the rapidly circulating giant cloud mass. The mountain chain forces the cloud to rise. This stirs the atmosphere to the extent that mixing and cooling occurs. As it cools, it condenses and falls, eroding



the range surface preferentially on the eastern slopes, before running back towards the molten lava surface.

Here it evaporates again returning in a cycle which rapidly transfers surface heat to outer space.

As the sialic surface grows, it covers an increasing portion of the Earth's lava surface with the lava pushing under the Sial layer in a similar fashion to that which happens today around the "ring of fire". When the lava surface solidifies, this lower more dense crust is called the Sima Layer.

Erosion of the sialic crust forms an expanding area of sedimentary layers which are limited by the Sima layer advancing under the upper crust.

Over time, nuclear activity within the Earth diminishes and the rate of lava production decreases, the proto continent breaks up and crust segments drift controlled by varying underlying magma flow currents.

INTERIM CONCLUSION: #7

These geological mechanisms suggests the Earth always had a "ring of fire" centered in the Pacific Basin, but previously it was much larger. Latterly it has become completely inundated with sea water and diminished to its current size allowing the continents to spread, and new oceans to form.

The question remains: **DOES THE EARTH SURFACE EXPAND AS WELL AS DRIFT?**

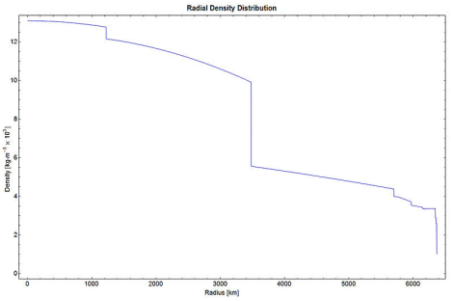
To test this theory, we assume the maximum area extent of the Sial layer was reached at the start of the Proterozoic 2.2by. The surface area available for Sial material will then be checked to see if it fits on Earth's reduced surface, together with room for the "ring of fire".

11. MASS EFFECT ON GRAVITY WAVES (GRAVIMASS)

The premise is that Earth (and all other bodies) expands under the influence of Gravity Waves. This occurs as a result of elastic links operating in a field of gravity, converting G into M as illustrated in Figure 1. **It is reasonable to assume the rate of expansion will be proportional to the mass density of respective seed particles**.

Reference 18

The average density of Earth is 5,515 kg/m^3. Since the average density of surface material is only around 3,000 kg/m^3, we must conclude that denser materials exist within Earth's core



The crust has an SG of 3000 kg/m^3 and is up to 60 km thick, but estimated to average 20 miles (32.2 km) Reference 8: Adams.

Crust comprises both the Sial and Sima layers covering the whole Earth. Earth's mean radius is 6371 km which shows the sub crustal material is 6338.8 km in radius and has an average SG of 5554 kg/m^3

We deduce from these figures that 3000/(3000+5554)=35% of Earth expansion occurred in the crustal material while the remaining 65% occurred in the sub crustal region.

Depth		Layer
Kilometres	**Miles**	
0–60	0–37	Lithosphere (locally varies between 5 and 200 km)
0–35	0–22	... Crust (locally varies between 5 and 70 km)
35–60	22–37	... Uppermost part of mantle
35–2,890	22–1,790	Mantle
100–200	62–125	... Asthenosphere
35–660	22–410	... Upper mesosphere (upper mantle)
660–2,890	410–1,790	... Lower mesosphere (lower mantle)
2,890–5,150	1,790–3,160	Outer core
5,150–6,360	3,160–3,954	Inner core

INTERIM CONCLUSION: #5 found *Earth may have been 2% less than the 86% indicated at 84%, or a radius of 5397 km.* Earth's size reduction was less since the Proterozoic by 2.2/4.5=48.9% of the of the age of Earth. The Proterozoic radius was 5895 km or 92.2% of the current radius.

Reference 19

ABSTRACT
Seismic-velocity models for Archean and Proterozoic provinces throughout the world are analyzed. The thickness of the crust in Archean province is generally found to be about 35 km (except at collision boundaries), whereas Proterozoic crust has a significantly greater thickness of about 45 km and has a substantially thicker high-velocity (>7.0 km/s) layer at the base. We consider two models that may explain these differences. The first model attributes the difference to a change in composition of the upper mantle. The higher temperatures in the Archean mantle led to the eruption of komatiitic lavas, resulting in an ultra-depleted lithosphere unable to produce significant volumes of basaltic melt. Proterozoic crust developed above fertile mantle, and subsequent partial melting resulted in basaltic under plating and crustal inflation. In the second model, convection in the hot Archean mantle is considered to have been too turbulent to sustain stable long-lived subduction zones. By the Proterozoic the mantle had cooled sufficiently for substantial island and continental arcs to be constructed, and the high velocity basal layer was formed by basalt under plating.

This reports the Proterozoic crust was thicker than present averaging 40 km and Table 1 is based on those assumptions.

TABLE 1
Present compared with Proterozoic Earth Surface

Present Earth Surface Area	km^2	5.10E+008	
Present Earth Continental Shelf surface area	km^2	2.04E+008	
Pacific Ocean Area (Area Percentage)	km^2	1.65E+008	32.4%
Proterozoic Sub Crust Surface Area	km^2	4.31E+008	
Proterozoic Crust Area	km^2	3.88E+008	
Ring of Fire Area (Area Percentage)	km^2	4.30E+007	10.0%

INTERIM CONCLUSION: #8

There was sufficient surface area available in the Proterozoic Era to accommodate the Sialic continents and a "ring of fire" region involving 10% of the available surface.

Thicker Proterozoic crust adds support to the expanding Earth theory in that the crust has since stretched to provide 20% thinning.

It is possible that Earth could have expanded up to 16% over 4.5by in which case, mass is being accumulated at a rate of 212,245 tonne per annum.

Expanding Earth and Plate Tectonics theories can coexist. Sima layers can subduct below Sial layers and Crust layers can thin and rift through the influence of underlying magma movement.

12. WEBOLOGY

Reference 1: http://en.wikipedia.org/wiki/Gravitational_constant

Reference 2: http://en.wikipedia.org/wiki/Division_by_zero

Reference 3: http://en.wikipedia.org/wiki/Hyperbolic_partial_differential_equation

Reference 4: http://en.wikipedia.org/wiki/Kruskal%E2%80%93Szekeres_coordinates

Reference 5: http://en.wikipedia.org/wiki/Neutrino#Neutrino_flavor

Reference 6: http://www.ps.uci.edu/~superk/neutrino.html

Reference 7: http://en.wikipedia.org/wiki/Expanding_earth

Reference 8: http://www.nealadams.com/nmu.html

Reference 9: http://en.wikipedia.org/wiki/Pair_production

Reference 10: http://en.wikipedia.org/wiki/Matter_creation

Reference 11: http://www.agu.org/pubs/crossref/2011/2011GL047450.shtml

Reference 12: http://en.wikipedia.org/wiki/Lava

Reference 13: http://www.britannica.com/EBchecked/topic/505970/rock/80194/Thermal-expansion

Reference 14: http://en.wikipedia.org/wiki/Continental_crust

Reference 15: http://www.bosmin.com/PSL/backcvr.htm

Reference 16: http://www.spacetelescope.org/images/opo0511a/

Reference 17: http://www.britannica.com/EBchecked/topic/474302/Precambrian-time

Reference 18: http://en.wikipedia.org/wiki/Structure_of_the_Earth

Reference 19: http://escweb.wr.usgs.gov/share/mooney/1991_archean%20and%20proterozoic%20crustal%20evolution.pdf

Reference 20: http://www.agu.org/pubs/crossref/2011/2011GL047450.shtml

Reference 21: http://hubblesite.org/newscenter/archive/releases/2011/20/video/

Reference 22: http://www.bosmin.com/PSL/26.htm

Reference 23: http://en.wikipedia.org/wiki/Planck_constant

Reference 24: http://en.wikipedia.org/wiki/Radiation_pressure

Reference 25: http://www.jpl.nasa.gov/news/news.cfm?release=2007-107

Reference 26: http://www.abc.net.au/science/articles/2012/02/24/3437977.htm

Reference 26: http://www.abc.net.au/science/articles/2012/05/03/3494617.htm

Reference 27: http://www.ndt-ed.org/EducationResources/CommunityCollege/Ultrasonics/Physics/WaveInterference.htm

Reference 28: http://en.wikipedia.org/wiki/Inverse-square_law

Reference 29: http://en.wikipedia.org/wiki/Stellar_black_hole

Reference 30: https://www.nasa.gov/feature/goddard/sounding-rockets/strong-evidence-for-coronal-heating-theory-presented-at-2015-tess-meeting