

# How Hard Is Hard Science?: A Caribbean View of the Electric Universe Paradigm

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The Electric Universe paradigm of science, which promises to become a new Natural Philosophy encompassing all sciences, holds many important implications for the future shape of physics, cosmology, geology, physical chemistry and the biological sciences, as well as for the humanities. In the author's belief it represents the single most important paradigm shift in human knowledge since the time of Sir Isaac Newton. The paper builds upon the author's presentation at the Natural Philosophical Alliance July 2011 conference in Maryland, USA and his ongoing series of articles in Cayman Net News by surveying the new paradigm's challenges to Special Relativity, the prevailing misconstructions of cosmology, the deficient notion of mass as quantity of matter, and the continuing misunderstanding of the nature of gravity, and points the way to the future promise of the Electric Universe paradigm's elucidation of severe weather events such as tornadoes and hurricanes, as well as geological events such as earthquakes and volcanoes.

The paper was originally intended to challenge local academia to take a positive lead in promoting the new paradigm as a Caymanian and Caribbean contribution to Natural Philosophy that will increasingly over the next 50 years assume world significance.

## 1. The New Paradigm of the Electric Universe

For many years it has become clear to independent investigators that the existing paradigm of physical science, accepted and taught in the halls of academia as barely challengeable, has become unfit for purpose.

To be sure, such a state of affairs is not altogether new in the world. In the Epilogue to his last book "The Discarded Image", CS Lewis writes about the mediaeval "model" of science and its succession by the currently accepted model in this way:

"The old astronomy was not, in any exact sense, 'refuted' by the telescope. The scarred surface of the Moon and the satellites of Jupiter can, if one wants, be fitted into a geocentric scheme. ... The new astronomy triumphed not because the case for the old became desperate, but because the new was a better tool; once this was grasped, our ingrained conviction that Nature herself is thrifty did the rest. When our Model is in its turn abandoned, this conviction will no doubt be at work again." [1]

Electric Universe researchers contend too that the paradigm of an Electric Universe is far more "economical" than the currently accepted model, but would also in my judgement add that the case for the standard model has reached the point of desperation [2, 3].

## 2. Einsteinian Relativity

Let us begin with the issue of Relativity. Justifiable excitement has appeared in the media over some recent experimental results which may prove that neutrinos can travel faster than light. These results are disputed and subject to confirmation. However, the whole of the Theory of Relativity is dependent upon light, or rather electromagnetic radiation in which light is a part, being the fastest possible messenger. Moreover, the Theory of Relativity has by now become a core principle that informs the working

of the standard model of physics. If Relativity falls, then many things we thought we knew about the Physics of the Universe, we know no longer. The question will undoubtedly arise:-

## 3. Is Relativity (Like Some Banks and Some Countries) Too Big to Fail?

In this forum we are well aware, as others are not because it is not as widely reported as it should be, that there is an increasing number of independent scientists who have proved to the satisfaction of many that the Theory of Relativity is at the least, questionable. I would now like to supply my "two cents" worth to their voice.

The celebrated lecturer Richard Feynman noted, "If the sun is exploding 'right now', it takes eight minutes before we know about it, and it cannot possibly affect us before then." [4] His reason for this supposition is the doctrine that the fastest "message" that travels between the Sun and the Earth does so at  $3 \times 10^8$  (three hundred million) meters per second, the speed of light through space. At that light speed the Sun viewed from the Earth appears to be where it actually was some eight minutes ago, and not where it actually is when it is being viewed. However, if the Sun by its gravitational pull is causing the Earth to maintain an orbit around it, the pull of the Sun on the Earth has to be from almost exactly where it is, and not from where it was eight minutes beforehand. If the pull of the Sun upon the Earth came from an eight minutes back position behind the Sun, the Earth (as well as all the other planets) would be slung out of orbit in short order and no solar system of planets could be maintained. It follows that there is a much faster messenger than light, namely gravity, that travels between the Sun and the Earth at a speed that makes the transmission of light seem like a dawdle.

The Electric Universe paradigm maintains that the gravitational influence of the Sun upon the Earth does act upon it by a discoverable process through the intermediary of what older

philosophers referred to as the “aether”, but that the speed with which this happens is vastly greater than the speed of light waves. This can be compared to mechanical wave motion, in which the speed of sound is vastly greater than the speed with which the ripples on a pond travel [5].

#### 4. Faraday's Homopolar Motor

A fundamental concept of the EU paradigm derives from Michael Faraday's invention of a device he called a “homopolar motor” - which is essentially the rotating disk type of electric meter we all love to hate in our homes. Going against the grain of mainstream physics, “the Nobel laureate Hannes Alfvén in 1986 posited both an ELECTRICAL GALACTIC MODEL and an ELECTRIC SOLAR MODEL. Alfvén's circuits are really scaled up versions of the familiar homopolar motor that serves as the watt-hour meter on each of our homes. The simple application of the Lorentz force equation ('crossing' the direction,  $v$ , of the current into the direction,  $B$ , of the magnetic field) yields a rotational force. Not only does this effect explain the mysterious tangential velocities of the outer stars in galaxies, but also (in scaled down version) the observed fact that our Sun rotates faster at its equator than at higher (solar) latitudes.” (Don Scott) [6]

#### 5. Kristian Birkeland

In 1916, Kristian Birkeland was probably the first person successfully to predict that the solar wind behaves as do all charged particles in an electric field: “From a physical point of view it is most probable that solar rays are neither exclusively negative nor positive rays, but of both kinds”. [7] In other words, the Solar Wind consists of both negative electrons and positive ions.

#### 6. Standard Terms of the Gravitational Universe

“Black holes” and “dark matter”, as well as “dark energy”, are all entities that have never been confirmed directly by any observation. Moreover, many people accept that their inherent nature makes direct observation of them impossible. They are, however, considered to be necessitated by a mathematical construction of the known universe, assuming that the universe “runs” by the weakest force known to man, namely gravitation. But what if that grand assumption were not true in the first place? What if the universe including our Sun “runs” by a much stronger force, namely electricity? Since we observe in everyday life that electrical forces are vastly stronger than gravitational forces, how long can it be maintained in all seriousness that for driving the universe the stronger force is to be ignored while the much weaker (gravitational) force is to be asserted?

But if the galaxies were powered by vast electrical energy transfers through the plasma environment of space, the puny force of gravitation in such a context could be safely ignored altogether. And this would mean that concepts that have been spawned by the gravitational universe assumption such as dark matter, dark energy, black holes, the Oort Cloud, and even the Big Bang itself along with a host of other stalwarts should be put out to the pastures of science fiction.

#### 7. Plasma Everywhere

Birkeland proposed that space consisted everywhere of plasma. Modern estimates indeed consider that more than 99.9% of the mass of the universe resides in the plasma.

#### 8. The Great Plasma Engine

Electric Universe theorists maintain that it is the transportation of electrical energy that the plasma facilitates that makes the stars shine, including our Sun, and produces all the electromagnetic radiation found in nature. The “solar wind” (so-called), the galactic currents and the inter-galactic electric circuits all play their part in maintaining the existence of the galaxies, the solar system and the geosphere and in maintaining human existence. These electrical power systems form connected parts of the great plasma engine that rules and empowers our universe.

#### 9. Sunspots

The EU model transforms our understanding of sunspots. There is a 22 year magnetic sunspot cycle, that cannot be explained by the standard model of the Sun. This cycle includes the switching over of the Sun's magnetic field every 11 years. Sunspots have a strong magnetic field and tend to draw together while yet maintaining individual integrity.

Kristian Birkeland in the early 1900s demonstrated sunspot-like phenomena in his Terrella experiments that involved electric discharges from a magnetised sphere. In the electric discharge a “doughnut” of circulating charge could be seen around the magnetised sphere. If the Sun is viewed by receiving its radiation in the ultra-violet part of the spectrum it is also found to feature a hot plasma “doughnut” encircling its equator. Excellent views of this phenomenon were obtained by NASA's spacecraft “SOHO”. In Birkeland's laboratory torus experiment, discharges fly from the torus to the mid- to low-latitudes of the sphere. At the scale of the Sun, such discharges punch holes in the photosphere and deliver current directly to the lower depths, thus exposing a view of the cooler interior. Here we have an explanation for sunspots. These are not formed by twisting magnetic fields popping up through the photosphere, but are found to be the footprints of powerful discharges from the encircling plasma “doughnut” to lower levels in the Sun's atmosphere.

#### 10. The Solar Cycle

In the electric model of the Sun there is a galactic power input to the Sun: the galactic power is direct current (DC) and the solar cycle is due to a varying DC power supply to the Sun. Thornhill and Talbott show the solar circuitry seeming to behave like a winding on a transformer, which responds to the varying DC input current by producing a magnetic field that switches polarity. If this is the case, the way the Sun works electrically adheres to simple electrical engineering principles [8].

Electric currents - from which the Sun and other stars receive their power - flow along the spiral arms of galaxies in the form of spiralling Birkeland filaments. As such filaments rotate past the solar system, the Sun will experience quasi-periodic power fluctuations; and this is the origin of the solar cycle.

## 11. Electrical Scenario of Comets

The existence of comets on their present trajectories with the use of current tools of observation and analysis reveals their genesis to be not in a distant past, but rather in a solar system that has been powerfully interactive in relatively recent times. Such a conclusion, unfeasible in the old paradigm, is made possible by an electric universe paradigm, for which the phenomenon of comets provides, along with a host of other observations and phenomena, massive additional confirmation [9].

## 12. "Quantity of Matter" Doesn't Explain Mass

As so often in the new paradigm, we build on the work of those who left us their legacy in the earlier part of the twentieth century. These words of the mathematician and philosopher Henri Poincaré were published posthumously in his book "Science and Methods" in 1914:

"What we call mass would seem to be nothing but an appearance, and all inertia to be of electromagnetic origin."

Yet mass has been regarded as an absolute measure of what physics textbooks - as well as NASA releases - call "quantity of matter". Using the word "quantity" as a definition, however, obscures the issue of "what kind of quantity?" (For in modern physics, "quantities" have units, and if you give this "quantity" a unit of mass - say kg - you have produced a circular argument. You have used mass in your explanation of what mass is.)

## 13. Mass as Electromagnetic Inertia

Mass is seen also in Newtonian physics as Inertia. Wal Thornhill has pointed out that if we apply force (for example, a push) to a body, which then moves (or at least reacts to the force), the interaction between the force and the body is an electrical one, pure and simple. Whatever attractive forces might exist are more than overcome by the forces of repulsion, chiefly those between the outer electrons in the atoms closest to the points of contact. As we look into the electrical nature of inertia and mass, we could find this concept needing adjustment, but for now the important point is that the basic nature of such forces seems to be electrical. As Poincaré pointed out a century or so ago, inertia (and therefore inertial mass) is an electromagnetic quantity.

This suggests that if the weight or heaviness of the body is proportional to its inertial mass, as Newton states and his (and our) experiments have confirmed, the pull of gravity is likewise an electrical (or electromagnetic) effect.

## 14. Understanding Gravity Electrically

Ralph Sansbury has proposed a possible model of the fundamental particles (electrons, protons and neutrons) of ordinary matter, and Wal Thornhill of the Electric Universe team regards this model as the key to understanding the force of gravity electrically. Sansbury proposes that fundamental particles are resonant systems of orbiting smaller electric particles of opposite polarity that sum to the charge of that particle. Sansbury referred to the smaller electric charges as "subtrons". Let us take, for example, an electron. An electron possesses a negative charge. In Sansbury's model, the electron is not just one single charged par-

ticule, but the summation of a number of orbiting smaller electric particles, some of which are positive and some negative. In the electron the negative subtrons must outweigh the positive subtrons because the summation is negative. It is important to note that each orbiting system of subtrons that constitutes the fundamental particle is a resonant system. The subtrons behave, so to speak, in an orderly way in sync with one another, so that a coherent entity - the electron, the neutron or the proton - is preserved. (This implies that the transfer of energy between the subtrons in their orbits must be nearly instantaneous, which like gravitational action in the solar system has devastating implications for the Special Theory of Relativity [10].)

The electrical model of mass and gravity differs from the Newtonian model in this way: in the Newtonian model, it is the mass of the particles of any object that generates (though without explanation) gravitational field. In the new electrical paradigm of mass, however, quantity of mass is a measure of how easily an electric field will distort the fundamental particles that comprise it into dipolar forms, because the more dipolar the particles comprising the body become, the more response will be apparent between that body and the presenting field. Neutrons and protons differ from electrons, therefore, not only by the subtron summation charges, but also in that their resonant subtrons are distorted far more readily into a dipolar configuration than is the case for electrons. We are used to saying that neutrons and protons have "more mass" than electrons. So they do, but now we have an idea of what is meant by that statement.

## 15. In the Footsteps of Michael Faraday

The great nineteenth century experimenter Michael Faraday was convinced of the importance of the connection between gravity and electricity. Faraday stated that he remained of the view that

"The long and constant persuasion that all forces of nature are mutually dependent, having one common origin, or rather being different manifestations of one fundamental power, has often made me think on the possibility of establishing, by experiment, a connection between gravity and electricity ... no terms could exaggerate the value of the relation they would establish." [11]

Thornhill rightly commented "Faraday's estimate of the importance of such a connection still stands."

## 16. Investigating the Constancy of "G"

During the mid 1970's I made an investigation of this possible relationship using a modified Cavendish-Boyd apparatus. While I did not specifically find what I was looking for, the results of the investigation seemed very clearly to show that the constant known to physicists as "big G" varied in a regular manner throughout the day. If this were confirmed it would agree with an assessment that has been expressed by a number of physicists that "big G" is the most uncertainly established "constant" in all of fundamental Physics. In Newtonian Physics, as well as in the solar system as has generally been described by scientists, it would be necessary for "big G" to be a constant. However, the Newtonian concept of gravitational force takes no account of a

possibility of the mass of a body being in any way subject to variation by electrical forces.

Thornhill at the 2007 SIS conference in Cambridge noted that

“The electrical model may explain the anomalous gravity readings taken down mineshafts, where Newton's constant,  $G$ , was measured to be 1.7 to 3.9% lower than in the laboratory. Rather than invent a 'fifth force' or 'modified Newtonian dynamics' (MOND) to complicate things, it seems we simply need to understand the electrical nature of matter and gravity.”

## 17. Gravity: Secondary Player, Not Primary

In their book *The Electric Universe* by Wallace Thornhill and David Talbott (pub by Mikamar Publishing), the authors state:

“The electric universe is a hypothesis, a new way of interpreting scientific data in the light of new knowledge about plasma and electricity. In this interpretation, gravity plays a secondary role behind the far more powerful electric force ... In the electric universe the gravitational systems of planets and moons, stars and galaxies have their origin in [the] proven ability of electricity to generate structure and rotation in plasma. Gravity can take over only as the electromagnetic forces approach equilibrium.” [12]

## 18. We Don't Really Want To Know This

As Thornhill and Talbott have suggested, in “our” world, the electromagnetic forces approach equilibrium, and so, almost universally, the Earth pulls us towards itself with gravitational force only.

From that circumstance, so fortunate for our lives, we have erroneously inferred that the whole cosmos runs itself gravitationally, and we have been prepared even to sacrifice our own common sense and scientific instincts upon the altar of rejecting at all costs the evidence of many observations that far more lively, dangerous and strong forces of electricity (with its attendant magnetism) are at work in the cosmos, away from those isolated regions, in one of which we exist, where electrical equilibrium has been approached. Actually, we really don't want to know that the cosmos as a whole (and even, to a lesser extent, the solar system) is very dangerous - and so, for as long as we are able to, we close our minds to the evidence that it is so.

## 19. Our World Is Still Subject To Electrical Disequilibrium

Nevertheless, even in our world, electrical equilibrium is not fully attained, and on occasion, our safe gravitational cocoon is disturbed and even cracked open by the power of the raging cosmic seas and floods of electrical plasma upon which we are founded and with which we are connected. Psalm 24 indeed refers to the Earth, and not just Cayman, when it declares: “For he hath founded it upon the seas, and established it upon the floods.” [13]

## 20. Lightning

In the Electric Universe paradigm, lightning is understood to be caused by the build-up of electrical potential differences be-

tween the Earth and its atmosphere and the “space” - thinly but ubiquitously filled with electrified plasma - around it. Ordinarily there are both dark current discharges and some glow discharges taking place, but when there are insufficient of these to keep the potential differences stable, an arc discharge - lightning - begins to be established, until the potentials causing it are sufficiently equalised. The standard paradigm regards lightning as caused by a terrestrial effect of cloud movements that build up electrostatic charge, whereas the electric paradigm sees it in terms of a local discharge of energies that originate in the cosmos, and a current electricity phenomenon rather than an electrostatic one. Lightning worldwide causes more human deaths than tornadoes or hurricanes, a fact that should signal that we need to think not only of the electrical potentials but also of the available power behind such a destructive strike.

## 21. Aurorae, Comets and Solar Storms

The Electric Universe paradigm declares the great physicist and experimenter Kristian Birkeland correct in his assessment of the fundamental nature of the aurora borealis and the aurora australis as due to currents of electric particles (plasma) moving in and out of the geosphere along the direction of Earth's magnetic field, and connecting us electrically with the Sun. This is now verified experimentally, although standard theorists still choose to give an explanation of the aurorae in terms of magnetic reconnection effects, an unfortunate concept that introduces the fictional reification of lines of magnetic force into scientific discourse. Birkeland's concept verifies the EU scenario of Earth being electrically connected with its environment, including in particular the Sun. This in turn opens our minds to the inevitability of solar events, such as coronal mass ejections, affecting the behaviour of the geosphere and the lives of its inhabitants. The headline of an article in a local newspaper recently read “Solar Storm May Disrupt Power.” It has already been found on more than one occasion that solar flares of high intensity have been associated with small variations of the length of the day - a variation that was in time “corrected” and stabilised to nearly the original day-length. This suggests that the mass of the earth, understood in the new paradigm in terms of the electrical deformation of its particles, is affected by the electrical environment of the earth, an environment that will influence the charge distributed over its surface, and which may also greatly affect the weather pattern. The new research opening up on the electrical connection between the Sun and the comets coming within its electrical influence, as illustrated by the otherwise inexplicable circumstances of their flaring and at times destruction far away from the Sun, should open up to us the concept of a very real, though in terms of our immediate comfort not at all necessarily welcome, electrical interaction between the Sun and all its satellites, including ourselves, and of a powerful electrical history that undergirds the current form and partial equilibrium of the solar system.

## 22. Tornadoes and Hurricanes

People experiencing the terrifying threat and presence of tornadoes have spoken sometimes of their seeing electric effects. See <http://collegetimes.us/on-the-electromagnetic-basis-of->

[tornadoes/](#). The rotation of tornadoes and hurricanes is supportive of the view that these phenomena are electrically driven, and the satellite pattern of hurricanes is strongly reminiscent of scientific depictions of galaxies. In an Electric Universe, the observed pattern of galaxies is inevitably caused by the electric force that drives them, and such forces and phenomena are scalable by many orders of magnitude, so that it becomes almost impossible to suppose that it is not the electric force driving the rotation of terrestrial hurricanes, often observed with electric effects as well.

### 23. Transmission of Gravity

It is important to bear in mind that Sir Isaac Newton never published any explanation for the transmission of gravity from one mass to another, for example from the Sun to the Earth. At the same time, Newton vigorously rejected the notion that one body acted “where it was not” upon another. We need also to bear in mind that Newton's relationships between the force acting upon two bodies and their masses involved the distance between them but without any time factor. The gravitational force, he found, varied inversely according to the square of the distance between the bodies, but the omission of any time factor must mean that the force between the bodies acted practically instantaneously.

Wal Thornhill has proposed (in agreement with earlier physicists) that the “aether” that pervades all space is what transmits gravity from one body to another, and the same “aether” transmits electromagnetic radiation such as light.

Thornhill proposes that the “aether” of space consists principally of neutrinos. Neutrinos are understood to be fundamental particles of vanishingly small mass (much smaller than the mass of an electron) and no charge. However, in the Electric Universe paradigm, and following the proposal of Ralph Sansbury, all fundamental particles consist of subtrons orbiting in a resonant manner that are positively and negatively charged, and whose total charges sum to the charge of the particle. In the case of the neutrino the positive and negative charges of the subtrons sum to zero.

Neutrinos have vanishingly small mass because, according to EU theory, the resonant orbits of their subtrons are extremely difficult to distort, and the resulting charge polarisation in a (now electrically understood) gravitational field is minimal. This is consistent with saying that neutrinos' response to a gravitational field is very small. However, to say that it is very small is not to say that it does not exist. In a gravitational field, the small polarisation of the neutrinos is in the direction of the field. In the case of gravity's longitudinal change (of a direct and not an alternating nature), it is transmitted by an almost instantaneously formed daisy-chain from one neutrino to another over a long distance. When that change alights upon and through particles such as protons, neutrons and electrons, because their resonant orbits of subtrons are much easier to distort than those of the neutrinos, they immediately manifest a degree of mass according to the ease of polarisation that they respectively provide.

The fact that powerful solar flares have been found seemingly to affect the mass of the Earth, albeit temporarily, suggests that as an electrical property of matter, the mass of an object may not be

altogether constant but may be subject to variations that old-paradigm physics would not allow [14].

In the electric universe paradigm, the worlds of mass and charge are not separated. With the Electric Universe concept it is possible to envisage a universe that could be in existence before gravitation spread throughout its reach. In the universe as we know it, gravitational mass is “caught” from the influence of a gravitationally engaged celestial body - say, a sun whose constituent particles are electrically polarised through the distortion of their subtronic orbits - with that influence travelling outward (at a speed of probably over 20 billion times the speed of light) through the aether of neutrinos and reducing in intensity with the square of the distance travelled, until it alights upon a solid, liquid or gaseous body, such as our Earth. That body's constituent particles are now gravitationally “caught” by the spreading gravitational influence of that sun and polarised electrically on account of the distortion of their subtronic orbits, and, gravitationally, the planetary body becomes a child of its parent, and perhaps a “parent” of children (its moons). Wal Thornhill proposes that the initial cause of the electrical polarisation within celestial bodies, i.e. their gravity, is due to the birth of stars and planets in powerful plasma discharge events.

Thornhill goes on to assert, “Once established, gravity itself provides a weak radial atomic polarisation by drawing the heavy nucleus away from the centre of each atom toward the centre of a planetary body.” This atomic polarisation is to be distinguished from the subtronic orbital polarisation that is gravity itself. Thornhill is saying that in a planetary body such as the Earth, there is a significant electrical pressure, due to gravity as it has been electrically explained, that distorts the atoms of the matter of the body, the positive nuclei being caused by the weak force involved to shift towards the planetary centre, as compared with the corresponding distortion of the orbits of the atoms' electrons, which are forced to shift away from the planetary centre. Thus, astonishingly for those of us brought up in the gravity-only paradigm, neutral atoms distorted by gravity induce an electric field inside a body. For an Earth-sized body the electric field thus induced will be very significant: the planet will act like an electrical version of a magn-et (magnet), called an electr-et (electret), and also any free electrons will as a result of the gravitational induction tend to move up towards the surface of the planet.

The depths of the planet are under pressure, causing pressure ionisation, thus increasing conductivity, and the separation of electric charges in connection with the upwards drift of electrons. The excess of electrons in the upper levels will mutually repel one another and therefore tend to offset the gravitational compression.

First, these considerations may provide a possible reasonable explanation for the “anomalous” gravity readings within mineshafts, where the gravitational constant,  $G$ , has been found to be lower than expected.

### 24. Earthquakes and Volcanoes

Secondly, these considerations should provide a rationale and provoke a scope and urgency for the investigation of electrical causation for earthquakes and volcanoes, for which like so many other phenomena, the causes in modern human imagination

have been confined to mechanically driven events in an assumedly neutral universe: this, in spite of the confirmed electrical effects that surround these phenomena. Tectonic plate boundaries may well be found in the new paradigm to be describable in terms of paths of increased electrical conductivity, repeatedly relieving local electrical stress, paths which give rise to explosive lightning-like electric currents within the Earth, drawing ionised and non-ionised matter along with them.

## 25. Age of the Solar System, Radioactivity Rate Dependence, Geological Time-Scale

These areas, which have been regarded by the text-books as certainly known, are all being given an entirely different framework by the new paradigm, and exciting challenges are ahead.

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- [ 10 ] see SIS Review 2008 "Electricity or Gravity: Which Rules the Universe?" by Wallace Thornhill" pp.85-100
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- [ 12 ] W. Thornhill and D. Talbott, op.cit. p.37
- [ 13 ] The motto on the armorial bearings of the Cayman Islands is "He hath founded it upon the seas", quoted from Psalm 24 verse 2.
- [ 14 ] See on "The Changing Length of a Day" in SIS Review 2008 "Electricity or Gravity: Which Rules the Universe?" by Wallace Thornhill", p.94.