Universal Gravity Based on the Electric Universe Model

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Introduction

While most people are aware of both Newton's Universal Law of Gravity and Einstein's Theory of Relativity, with its implications on gravity, few people are aware of the existence of a third theory promoted by the Electrical Universe community, a fringe science group popular on the internet. And even fewer are aware of the basic premises and maths associated with the Electric Universe theory.

As for myself, I had not paid much notice of the Electric Universe model until I got involved in helping Mr. Peter Woodhead find theoretical support for his theory about the dinosaurs and how they could have grown as large as they did.

Unlike other theories attempting to explain the impossible size of the dinosaurs, Peter Woodhead's theory does not include any mysterious mechanism for mass increase. Instead, his theory suggests that our planet has expanded due to internal pressures and that the subsequent change in the distribution of mass has resulted in an increased surface gravity.

However, while this simple explanation solves a number of problems, Peter Woodhead's theory got heavily criticized for being incompatible with Newton's Universal Law of Gravity.

But seeing that the alternatives to Woodhead's theory were to introduce magical mechanisms for mass creation, I found his theory deserving a closer look, and it was during this investigation that I got the idea that the Electric Universe model might provide support for Woodhead's theory.

As it turned out, the maths associated with the Electric Universe model did not only support Peter Woodhead's theory, but gave the exact numbers that people had been looking for.

From fossil records, people like Stephen Hurrell had estimated that surface gravity must have increased by at least 400 per cent since life first appeared on our planet. And my calculations based on the assumption that gravity is a dipole at the atomic level yielded an increase of exactly 500 per cent.

The number I arrived at was spot on, and from this I concluded that both Peter Woodhead's theory and the Electric Universe model of gravity are likely to be correct.

Encouraged by this, I published a paper called "The Electric Universe Model of Gravity and the Expanding Earth" which is freely available on the web for anyone interested in the subject. And seeing that there has been little theoretical work associated with the Electrical Universe model, I decided to make a more general analysis in the hope of finding additional support for it.

Having found my mathematical approach fruitful in my work on Peter Woodhead's theory, I decided to continue with the same general approach. Continuing where I left off in my first paper, I set off to discover the general rules associated with the Electric Universe model as it applies to universal gravity, and cosmology in general.

Methodology

Since the purpose of this work was to build support for the Electric Universe model, I have been careful not to introduce anything that does not directly follow from the model itself or from observed facts.

Having made up my mind to find the maths associated with the Electric Universe model of gravity I could not very well make any changes to the original theory. I had to stick to the assumption that the Electric Universe model is correct, and let the logic flow from there.

Retracing my thinking in this paper we will therefore start where I began, with the premise that there must be one or more Universal Gravity functions associated with the Electric Universe model in the same way that Newton's point source model of gravity has a Universal Gravity function associated with it.

Following Newton's example, we will not try to explain exactly how things work but rather formulate a mathematical model based on what we can see and what we can reasonably assume to be true based on the Electric Universe theory. Our aim will be to derive a descriptive model, and we will leave the question of how exactly things hang together for others to speculate in.

The Electric Universe Model of Gravity

At the heart of the Electric Universe model of gravity is the idea that gravity is a dipole at the atomic level, and not a point source as postulated by Newton.

Furthermore, the Electric Universe model postulates that the dipoles, which are best imagined as "gravitational stick magnets", align in such a way that their "positive poles" all point to the center of our planet, while the "negative poles" point out towards the surface, making it "negatively charged" from a gravitational viewpoint.

Small bodies like rocks and dust, all have "internal stick magnets" that align with the gravitational field of our planet, and we are therefore pulled down by gravity in much the same way a collection of freely rotating stick magnets would be pulled down by a magnetic surface.

We will use the analogy of stick magnets throughout this paper because magnetism is a good example of a dipole phenomenon. But gravity is not magnetism so we will use quotation marks to emphasize that we are merely using the analogy for convenience.

Stellar and Cosmic Bodies

In our analysis we will refer to large spherical bodies such as our sun, planet and moon as stellar bodies, while smaller bodies such as dust, rocks and asteroids will be referred to as cosmic bodies.

And since we will find in our analysis that the two types of bodies do not behave identically in a dipole universe, the distinction is not merely cosmetic but mathematically significant. The reason for this is that stellar bodies have "negatively charged" external surfaces, while cosmic bodies have freely rotating "internal stick magnets".

Furthermore, in my paper "The Electric Universe Model of Gravity and the Expanding Earth", I showed that all stellar bodies must have a "positively charged" internal surface due to the dipole nature of the Electric Universe model, and we will use this conclusion as a fact in this paper.

We will define stellar bodies as having a "negatively charged" outer surface and a "positively charged" inner surface, and we will define cosmic bodies as having freely rotating "internal stick magnets".

Only under extreme circumstances will a stellar body allow its "internal stick magnets" to change their orientation, in which case the stellar body ceases to be a stellar body, and becomes a cosmic body instead. Intermediate size bodies on the other hand may flip flop between being a stellar and a cosmic body depending on the size of the objects it interacts with.

Analyzing Newton's Law of Universal Gravity

In developing his Universal Law of Gravity, Newton made the assumption that the only factors involved in gravity, apart from it being a point source at the atomic level, was the mass of the objects involved, their distance from each other, and a constant. And from this he derived his function:

$$F = G\frac{M_1 M_2}{d^2}$$

Newton derived this function without any further explanation than that it had to be correct for the simple reason that no other elements are known to have an influence on gravity and that it fits observations given the right value of G.

Newton's Law of Universal Gravity is in other words a hack. It is as it is, not due to some profound insight into the nature of things, but because it works without introducing anything except G beyond the observed elements.

Newton used the inverse square law when dealing with distance since this fit the observations. In other words, he used the law governing radiating bodies, and treated gravity as something that radiates from a point source at the geometrical center of stellar bodies.

However, in the Electric Universe model, gravity is neither a point source nor something that radiates. Gravity according to the Electric Universe, is something akin to magnetism, with attracting and repelling surfaces. So, where Newton used the inverse square law, we must instead use the inverse cube law that governs attracting and repelling fields.

At the base of our equations we will find the following:

$$F = K\frac{M_1 M_2}{d^3}$$

And since we cannot simplify matters by modeling gravity as a point source at the geometrical center of stellar bodies, we also have to consider the surfaces from which the gravitational fields emanate.

The geometry of curved surfaces will play an important role in the equations we will be deriving.

Since we know that Newton's Law is a good fit for a large range of observations, we know even before we have started that these geometrical considerations will have to significantly moderate our base function in order to give us a good representation of reality.

However, we also know that Newton's Law does not fit all observations equally well, and our aim must be to come up with equations that describe both the Newtonian and non-Newtonian range of observations.

Repelling and Attracting Surfaces

Since the Electric Universe model postulates that all stellar bodies have an outer surface that is "negatively charged" from a gravitational viewpoint, it would appear that all stellar bodies should repel each other, rather than attract. And with such a clear contradiction with observed facts, the knee jerk reaction is to say that the theory must be wrong.

However, a stellar body does not only have a "negatively charged" outer surface, it also has a "positively charged" inner surface. And if the field emanating from this inner surface acts relatively unhindered through the shell of its body, we have a much more subtle situation.

Taking the earth and the moon as an example we have the following repelling and attracting fields:

1. Outer surface of moon repels outer surface of earth
2. Inner surface of moon repels inner surface of earth
3. Outer surface of moon attracts inner surface of earth
4. Inner surface of moon attracts outer surface of earth

Furthermore, we have to consider the shape of the surfaces involved since it is reasonable to expect that this will have a significant effect on how the gravitational fields spread.

Since we are dealing with dipoles, we can assume that only surfaces facing each other are interacting with each other. The gravitational fields emanating from the back of the moon, for instance, do not interact with our planet, nor does the back of our planet, as seen from the moon, interact with the moon.

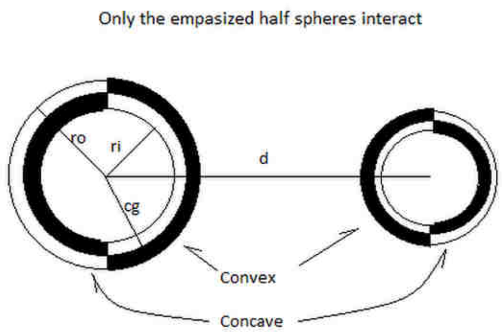

Fig 1. Interacting half spheres

And from this we see that the repelling fields are between the two convex outer surfaces and between the two concave inner surfaces of our stellar combination, while the attracting fields are between two convex-concave pairs.

Geometrical Considerations

When it comes to the geometry of spherical surfaces and how they affect the gravitational fields emanating from stellar bodies, we have the following factors to consider:

1. The shape of the surface, being either Convex or Concave
2. The radius "ro" from the geometrical center to the outer surface
3. The radius "ri" from the geometrical center to the inner surface
4. The radius "cg" from the geometrical center to the center of gravity
5. The distance "d" between the geometric centers of the two bodies involved

And from this we can conclude that we are dealing with two functions:

1. Convex(ro, ri, cg, d)
2. Concave(ro, ri, cg, d)

These two functions describe the moderating factors that apply to our base function F = K*M1M2/d^3 to produce the net effect of gravity at a given distance.

For instance, the force between the two outer surfaces of a pair of stellar bodies M1 and M2, can now be expressed as:

$$F = -\,Convex(ro_1, ri_1, cg_1, d) * Convex(ro2, ri_2, cg_2, d) * K\frac{M_1M_2}{d^3}$$

The geometry of the two stellar bodies has now been added to our base function F = K*M1M2/d^3 in the form of two moderating functions.

To simplify things, we can use the fact that the geometries expressed by the Concave and Convex functions are related to the two bodies M1 and M2, and we can therefore use Convex(1) as shorthand for Convex(ro1, ri1, cg1, d) and Convex(2) as shorthand for Convex(ro2, ri2, cg2, d). And if we simplify things further by expressing our base function as B(d) instead of K*M1M2/d^3 we get the following shorthand for the above function:

*F = - Convex(1)*Convex(2)*B(d)*

Note that we have made the force negative in this particular case since the two convex surfaces are both "negatively charged", and therefore repelling each other.

Note also that we are not saying anything about what the moderating functions do. We are simply saying that they play a role in determining the force between stellar bodies. However, we can make the assumption that the Convex function will result in a field that tapers off quicker than a field moderated by the Concave function.

Concave surfaces are after all generally associated with focus, while convex surfaces are associated with spread. A satellite dish is a typical example of a focusing device based on the geometry of a concave surface, while lamps designed to spread light in all directions use convex surfaces to do this.

However, both functions are likely to produce an overall focusing effect since the base function is such that it requires moderation of the focusing kind in order to compensate for the inverse cube law. The

Concave function is likely to be the one with the strongest focusing effect. But the Convex function will have a focusing effect too, at least at intermediate distances.

Deriving the Universal Gravity Function for Stellar Bodies

Armed with the base function

$$B(d) = K\frac{M_1 M_2}{d^3}$$

and the Convex and Concave functions we are now in a position to derive a function for gravitational force between two stellar bodies.

Using our shorthand notation we get the following four equations for the four surface combinations of two stellar bodies:

1. The two convex outer surfaces repel each other according to

   *F = Convex(1)*Convex(2)*B(d)*

2. The two concave inner surfaces repel each other according to F = Concave(1)*Concave(2)*B(d)
3. The first concave-convex surface combinations attracts each other according to

   *F = Concave(1)*Convex(2)*B(d)*

4. The second concave-convex surface combinations attracts each other according to

   *F = Convex(1)*Concave(2)*B(d)*

Subtracting the repelling forces from the attracting forces we get the overall force:

*F = Concave(1)*Convex(2)*B(d) + Convex(1)*Concave(2)*B(d) –*
*Convex(1)*Convex(2)*B(d) - Concave(1)*Concave(2)*B(d)*

*F = (Concave(1)*Convex(2) + Convex(1)*Concave(2) –*
*Convex(1)*Convex(2) - Concave(1)*Concave(2)) * B(d)*

And from this we see that we have a complex geometrical expression that is rather lengthy to write. If we give this lengthy expression the shorthand notation Complex() we can express the full equation as:

F = Complex() * B(d)

where

- ***Complex()*** *= Concave(1)*Convex(2) + Convex(1)*Concave(2) - Convex(1)*Convex(2) - Concave(1)*Concave(2)*
- $B(d) = K\frac{M_1 M_2}{d^3}$

Analyzing the Universal Gravity Function for Stellar Bodies

Note that while the base function is known to us as $B(d) = K\frac{M_1M_2}{d^3}$, we do not have any specific knowledge of the Concave and Convex functions apart from our assumption that the Concave function moderates the base function in a more focusing manner than the Convex function.

The surface combinations have the theoretical capability of moderating the base function in such a way that we get a Newtonian result for a large range of values. And this is in fact how things must be in order to conform with observations.

With Newton's Law agreeing well with a wide range of observations, our full function must give results that agree with Newton's Law for the distances where Newton's Law can be applied without moderation.

Letting Newton's Law be equal to our universal function we get:

$$G\frac{M_1M_2}{d^2} = \textit{Complex() * B(d)}$$

$$G\frac{M_1M_2}{d^2} = \textit{Complex() *}\ K\frac{M_1M_2}{d^3}$$

$$\textbf{\textit{Complex() =}}\ \frac{Gd}{K}\ \text{\{ in the Newtonian range \}}$$

The Convex and Concave functions must in other words be such that they generate a linear result for the Newtonian range.

However, this is not to say that our full function will agree with Newton for all values. At extremely short distances for instance, the two outer surfaces of a stellar combination will no doubt dominate the complex geometry.

The two outer surfaces are the only ones that can have direct contact with each other, which means that these mutually repelling surfaces have the potential to generate enormous repelling forces, easily dwarfing all the other geometrical factors.

As a result, our universal function is likely to reduce to the following for extremely short distances:

F = - Convex(1)*Convex(2)*B(d)

And observations do in fact confirm this. Binary stars in extremely close orbit with each other are tremendously unstable and will either merge into a single object or definitely repel each other into a wider and more stable orbit within months, a mere blink of an eye in the cosmic scale of things.

The two outcomes of a very close encounter between stellar objects is in other words a swift repulsion or a merger, exactly as predicted by our investigations so far.

As for very large distances there is another interesting prediction we can make from our function. Since the concave-concave combination is the one with the greatest degree of focus, this part of the overall function will become dominant at some point even if it is relatively insignificant at shorter distances.

At large distances our universal function reduces to:

F = - Concave(1)*Concave(2)*B(d)

Again we are getting a repelling force.

And this too is in accordance with observations. Distant galaxies are not only receding from each other, but are accelerating rather than slowing down. So, something is pushing distant galaxies apart, and with no good explanation for this in the standard model, the repelling force is put down to a mysterious "dark energy".

However, using our function based on the Electric Universe model, we see that the observed repulsion is in fact what we would expect. This phenomenon that cannot be satisfactorily explained in the standard model is nothing more than gravity itself, acting s a repelling force at large distances.

Establishing the Newtonian Range for Stellar Bodies

At this point we have found that our universal function for stellar bodies yields a repelling force at extremely short distances and also at large distances, and it follows from this that there must be two zero points where gravity goes from negative to positive. One of these zero points occurs at an extremely short distance, and the other one occurs at a very large distance.

A consequence of this is that there is an upper and a lower limit to the size of stellar orbits. And since all of this is dependent on the geometry of the bodies involved we can assume that a large stellar body can support a wider orbit than a smaller stellar body even if the mass of the two bodies are the same.

For our sun, we know that its stellar companion with the widest known orbit is the dwarf planet Eris which at its most distant is about 100 astronomic units away from the sun. So we know the distant zero point has to be farther away than this, but not necessarily much farther away.

The near zero point for stellar bodies orbiting our sun must by the same logic be closer than the orbit of Mercury, but not necessarily all that much closer. Mercury does after all exhibit non-Newtonian behavior in its orbit, which indicates that it is in an area close to where gravity starts changing from an attracting to a repelling force.

From observations it would appear that the Newtonian range for our sun relative to its planets is located in the Mercury to Eris range, and that any stellar body outside this range will display non-Newtonian behavior.

For bodies larger than the sun, the Newtonian range can be expected to be at a greater distance both to the inside and to the outside, while smaller bodies will have its Newtonian range at a shorter distance.

This follows from the general logic of geometry, where things can be expected to behave in a proportional manner. But we also have observational evidence to support this assumption.

Mercury is after all in a slightly non-Newtonian orbit around the Sun, while our moon is distinctly Newtonian in its orbit around our planet, despite being much closer to the Earth than Mercury is to the Sun.

The relatively small size of our planet compared to the Sun is clearly of importance.

Plotting the Universal Function for Stellar Bodies

To sum things up, we now know from theory and observation that our universal function for stellar bodies has to conform to Newton's Law for distances typical in our solar system, but turn negative for extremely short distances and very large distances, and from this we are in a position to plot the following graph of force against distance:

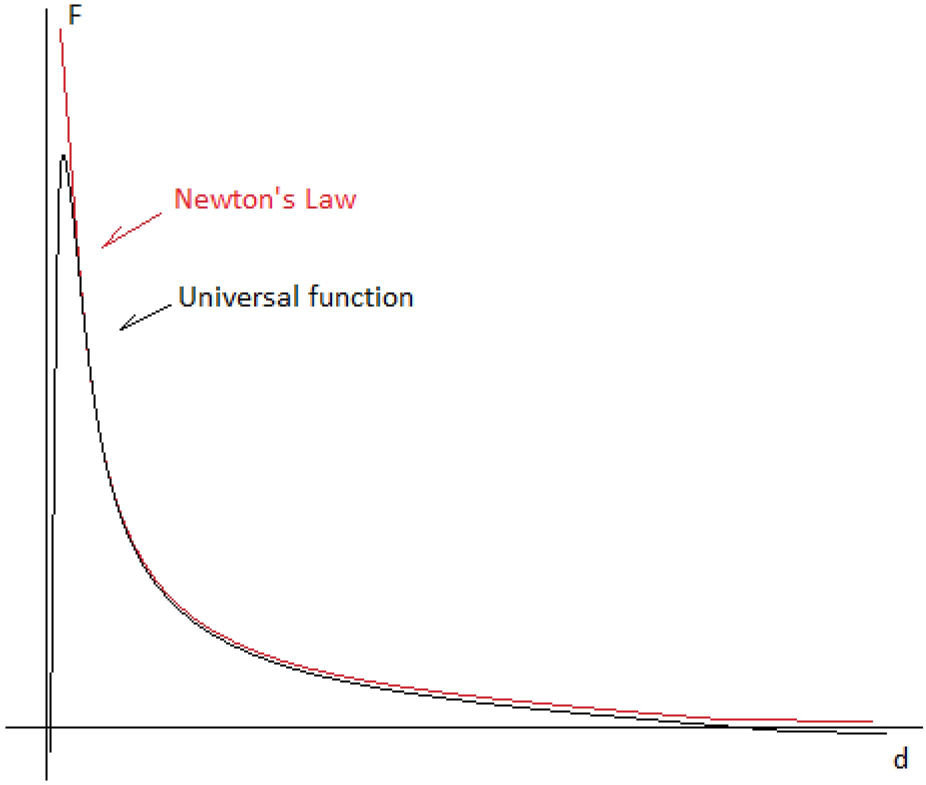

Fig 2. Universal gravity for stellar bodies

The curve of our universal function is smooth and natural, and without knowing much more than this at the moment, we can so far conclude that the Complex function should be relatively easy to derive.

Given enough data points it should be possible to derive both the Concave and the Convex function.

Gravitational Capture and Stability

Finally, before going on to discuss cosmic bodies, it should be noted that the fact that gravity becomes repelling between stellar bodies at extremely short distances, yet positive at intermediate distances, means that the Universal Gravity function based on the Electric Universe model has in it the mechanism required for a stellar body to capture another body and subsequently stabilize its orbit.

In general, we can say that the Electric Universe model produces a more stable universe with stellar bodies rarely being pulled out of one system without being included in another. In a collision scenario with two solar systems coming into extremely close contact, there will be tremendous upsets, but things will stabilize relatively quickly.

Capture and a quick return to stability will be the rule in an Electric Universe, rather than the chaos of collisions and scatter predicted by Newton.

Universal Gravity applied to Cosmic Bodies

While the stellar bodies that we have discussed so far can be thought of as spherical shells with a "negatively charged" outer surface and a "positively charged" inner surface, cosmic bodies can best be described as bodies containing freely rotating "internal stick magnets".

And it follows from this that the biggest difference between a stellar body and a cosmic body, apart from their different size, is that the "internal stick magnets" of a cosmic body will always orient themselves in such a way that there will be attraction between them and whatever other body they are influenced by.

Furthermore, cosmic bodies have no "charged surfaces", and it follows that our universal function for stellar bodies cannot be used for cosmic bodies.

A cosmic body in gravitational interaction with a stellar body will be under influence of the two surfaces of the stellar body, and the "internal stick magnets" of the cosmic body will orient themselves towards whichever surface is the dominant one.

At short distances, the outer surface will dominate. However, due to the moderating effect of curvature, the internal surface will dominate beyond a zero net gravity point as illustrated in Fig 3.

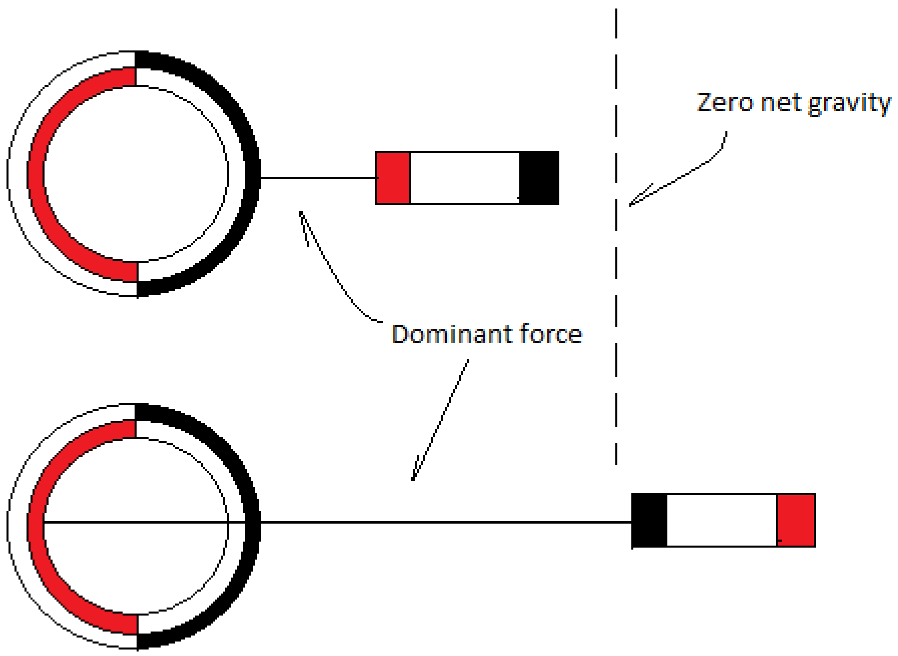

Fig 3. Attraction between a stellar and a cosmic body

The existence of a zero net gravity point follows from the fact that there can be no net gravity where the "internal stick magnets" of the cosmic body turn to realign themselves with a different surface of a stellar body.

Paradoxically, gravity will taper off to zero and then grow again for a while before again tapering off towards zero, and it follows from this that there must be a region around every stellar body which is virtually free of any cosmic bodies, yet where there is a marked increase in the density of such bodies at a farther distance.

This follows from the fact that nothing can form a stable orbit at zero gravity. Any motion in such a region will cause a cosmic body to either fly off into a farther region or plunge closer to the stellar body.

Mathematically we no longer have four, but two curved surfaces to consider, and we have to allow for the fact that cosmic bodies always let their "internal stick magnets" align in such a way that they attract.

From this we get:

*F = | Convex(1)*B(d) - Concave(1)*B(d) |*

*F = | Convex(1) - Concave(1) | * B(d)*

In other words, we have the same base function B(d) = K*M1M2/d^3, but a different moderating geometry. And we express the fact that this function never goes negative with the use of absolute value symbols.

Furthermore, we can simplify the above by using the shorthand name Combined() to express the moderating term:

Combined() = | Convex(1) - Concave(1) |

And we can write our universal function as follows:

F = Combined() * B(d)

where

- ***Combined()*** *= | Convex(1) - Concave(1) |*
- $B(d) = K\frac{M_1 M_2}{d^3}$

Analyzing the Universal Function for Cosmic Bodies in Interaction with Stellar Bodies

The difference between the universal function for two stellar bodies and for a cosmic body interacting with a stellar body is confined to geometry. The base function B(d) is the same in both cases. However, the Complex and the Combined functions are very different, and we must therefore expect significant differences between the two cases, at least in certain regions.

However, one thing the two universal functions must have in common is an ability to be Newtonian for a large range of values. Just like the Complex function must produce a linear result for the Newtonian range, so must the Combined function.

Letting Newton's Law be equal to this universal function we get:

$$G\frac{M_1M_2}{d^2} = \textit{Combined() * B(d)}$$

$$G\frac{M_1M_2}{d^2} = \textit{Combined() * } K\frac{M_1M_2}{d^3}$$

$$\textbf{\textit{Combined() =}} \ \frac{Gd}{K} \quad \text{\{ in the Newtonian range \}}$$

However, this is not to say that the Newtonian range for cosmic bodies is the same as that of stellar bodies. In fact, it is easy to see from the geometrical functions themselves that this cannot be the case. They are much too different to result in identical Newtonian ranges.

One big difference between the functions is that the Complex function has two zero points, beyond which there is negative gravity while the Combined function has a single zero point in between two positive regions.

There is no negative solution for the Combined case, and it follows that there is no limit to where cosmic bodies can orbit relative to a stellar body.

With the notable exception of the zero point, cosmic bodies can establish stable orbits at any distance around a stellar body.

Orbital Speeds

An important consequence that can be derived from the fact that the Complex and Combined functions are different is that stellar and cosmic bodies will not generally orbit a stellar body at the exact same speed. In most regions, there will be a difference in speed between these two types of bodies, and as a consequence, the larger stellar body will gobble up all the smaller cosmic bodies that constantly get in its way.

However, since the Combined function has a different shape than the Complex function, there may be one or more region where stellar bodies orbit at pretty much the exact same speed as cosmic bodies.

In such regions, we would be able to find a high density of asteroids together with one or more stellar bodies. And as a matter of fact, we have two such regions in our solar system. The closest being the Asteroid Belt with its dwarf planet Ceres, and the more distant being the Kuiper Belt with its dwarf planet Pluto.

This suggests that there are two points where the Complex and Combined functions yield identical values:

Complex() = Combined()

Complex() = | Convex(1) - Concave(1) |

Assuming the two solutions are at either side of the zero point for the combined function, we get the following two solutions:

Complex() = Convex(1) - Concave(1)   { for the near solution }

and:

Complex() = Concave(1) - Convex(1)   { for the far solution }

And since this is a general observation that we must assume to be true for other solar systems too, we can make the prediction that most, if not all solar systems, possess two asteroid rich regions corresponding to our Asteroid Belt and Kuiper Belt.

Plotting the Universal Function for Cosmic Bodies Orbiting Stellar Bodies

From the above analysis, it follows that we can plot the graph for the universal function for cosmic bodies orbiting stellar bodies.

Taking the graph for stellar bodies acting among themselves, we can superimpose the graph of cosmic bodies orbiting stellar bodies, and we get the following:

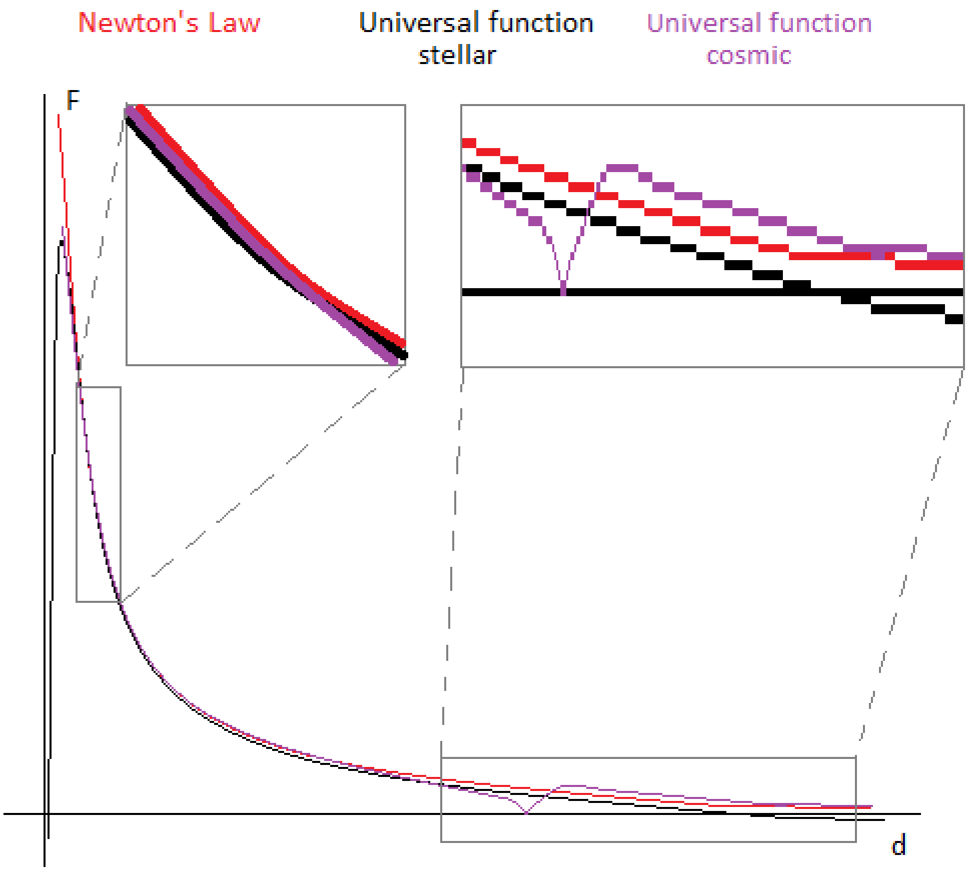

Fig 4. Universal gravity for cosmic bodies orbiting stellar bodies

As we can see, the far point where the Complex and Combined functions are equal is relatively easy to spot, while the near solution is less obvious. And it follows from this that there should be observable anomalies in the far region, while any anomaly in the near region would be almost undetectable.

It is also clear that we now have even more data points that we can use in order to derive the Concave and the Convex functions.

The more anomalies we can find, the more data we have, and with the far region of our solar system being a likely place to find anomalies for cosmic bodies, we proceed to look into the known anomalies for that region before looking into known anomalies and interesting observations closer to home.

Orbits of Long-Period Comets

The orbits of so called long-period comets have always posed a problem for astronomers. Comets that travel beyond the Kuiper Belt all have orbits that have proven themselves impossible to predict, and many do not return at all. And this anomaly has been put down to gravitational pull of nearby stars and the hypothetical existence of an asteroid rich region in deep space called the Oort Cloud.

However, as we will see, no Oort Cloud is needed to explain the observed facts.

The fact that many comets do not return is most probably due to the fact that most comets are intermediate size bodies, and such bodies will typically be expelled from our solar system once they go beyond the point where gravity for stellar bodies goes from being an attracting to a repelling force.

And with comets also being small enough to display cosmic body properties, they will be affected by the zero point for cosmic bodies. Comets traveling away from our sun will first be subjected to an unexpectedly small gravitational pull before being subjected to an unexpectedly large pull seen from a Newtonian viewpoint.

And it follows that the orbits of long-period comets cannot be predicted by the Newtonian model because these orbits are not perfectly elliptical. It also follows that the hypothetical Oort Cloud is unlikely to exist since the basis for its proposed existence no longer holds.

The Pioneer Anomaly

After passing about 20 AU from the sun, the deep space probes Pioneer 10 and Pioneer 11 no longer followed the path predicted by standard theory. Instead, the deep space probes followed a path conforming to a slightly stronger than expected gravitational pull towards the sun.

The accepted explanation for the anomaly is currently put down to a phenomenon called thermal recoil force, where it is suggested that heat escaping through the shady side of the probes exert a force towards the sun. However, this rather fanciful explanation is only there to support the standard model. Using our model, the phenomenon can easily be explained as dipole gravity.

On their way out of the solar system, the deep space probes first entered a short region with low gravitational pull towards the sun before entering a large region with gravity higher than standard theory predicts, and while the effect of the first region went undetected, the effect of the subsequent higher than expected gravity region became so evident that it could not be put down to measurement errors.

Interestingly enough, the anomaly was first discovered at 20 AU which is at the start of the Kuiper Belt. And since we have already established that the zero point for cosmic bodies orbiting the sun is located between the Asteroid Belt and the Kuiper Belt, the location of the anomaly fits our theory very well.

The Kuiper Belt is in the region where dipole gravity is stronger than standard theory predicts. And it follows that the Kuiper Belt is exactly where we would expect to see an anomaly of this sort.

The short distance with low to no gravity was passed undetected, and it was not until the space probes were well into the region of stronger gravity that the anomaly was detected. But this is no surprise since no one expected to see any anomaly at all. The relatively short region of low gravity did evidently not produce a large enough deviation to catch the attention of astronomers.

However, the anomaly should not have come as a complete surprise. Comets follow the same general path as the deep space probes, and we have known for a long time that comets do not follow perfect elliptical paths, so why should we expect the deep space probes to somehow behave differently?

Flyby Anomalies

Closer to home, we have the so called flyby anomalies, which are marked by an unaccounted for velocity increase for space probes using our planet's gravitational field to accelerate.

As a matter of fact, all sorts of near surface anomalies have been known to scientists for a long time, so the flyby anomaly should not have come as a big surprise. Close to the surface of our planet, things do not generally conform well with Newton's simple model where all mass can be modeled as a point source at the geometrical center of our planet. The flyby anomalies are in other words just another type of the many anomalies associated with near surface gravity.

As for our dipole gravity model, these anomalies contain important clues to the nature of the Convex function, because the effect of Earth's internal surface can most likely be ignored when modelling near surface phenomena.

Very close to Earth our function

$$F = | Convex(ro, ri, cg, d) - Concave(ro, ri, cg, d) | * B(d)$$

can be reduced to

$$F = Convex(ro, ri, cg, d) * B(d)$$

And from my paper "The Electric Universe Model of Gravity and the Expanding Earth", we can deduce that the Convex function solves to 1 where d equals the radius of our planet. The reason for this being that we did not use any moderating function in calculating the 500 per cent increase in gravity from pre-expansion times. We simply assumed that there was no moderating effect. and since our numbers came out correct, we have strong supporting evidence for our assumption.

However, as we leave the surface of our planet by going into an airplane, for instance, an important moderating effect kicks in. And I touched upon this fact towards the end of my paper on the expanding Earth. Noting that we get roughly a 1 per cent decrease in gravity at 10 km altitude, I made an initial analysis of what the moderating function might look like.

As expected, the moderating effect has to be of the focusing kind at 10 km.

This follows from the following observations in my paper on the expanding earth:

- With no moderation of our base function, gravity would fall by about 12.5 per cent at 10 km altitude
- Actual gravity at 10 km altitude is down by a mere 1 per cent

And from this we can deduce that if Convex(ro, ri, cg, d) = 1 at the surface of our planet, then Convex(ro, ri, cg, d) = 1.1 at 10 km above the surface of our planet.

Furthermore, from the flyby anomalies it appears that the Convex function has the effect of actually overshooting Newton's predictions at high altitudes:

$$\textit{Convex(ro, ri, cg, d)} * K\frac{M_1 M_2}{d^3} > G\frac{M_1 M_2}{d^2} \quad \text{\{ at flyby values for d \}}$$

And since we have derived exact values for ro, ri, cg and d in my paper on the expanding earth, it follows that the flyby anomalies can provide important insights into the exact nature of the Convex function.

The Role of Interstellar Dust in Galaxies

Having considered cosmic bodies orbiting our sun and the Earth, we can go on to consider cosmic bodies under the influence of more than one stellar body such as is the case for interstellar dust and rocks.

Under such circumstances, the "internal stick magnets" of cosmic bodies will always align themselves with the dominant field. However, if at all possible the "internal stick magnets" will align themselves so as to attract all the fields influencing them, and not only the dominant field.

The "internal stick magnets" will always seek to orient themselves in such a way that they produce a maximum net attracting force. And the result of this is that interstellar dust and rocks play an important role in countering the repelling forces between stellar bodies.

While stellar bodies repel each other at large distances, cosmic dust and rocks have the effect of producing a net attracting force between stellar objects. And the more dust and rocks there is in a region separating two stellar bodies, the more net attraction there will be.

Given the right relative proportions of cosmic and stellar bodies we end up with a stable system that keeps its shape in the typical non-Newtonian way that galaxies do.

Had this not been the case, our Milky Way Galaxy, with its diameter of about 120 000 light years, would have been completely blown apart by the repelling forces between stellar bodies. But as is evident from observation, the Milky Way Galaxy holds itself together nicely.

The dusty arms of our spiral galaxy are like ropes spinning out from its dusty center, and the mutually repelling forces between the spinning arms keeps the structure in place. The arms are held together by the attracting forces of dust and rocks, while the repelling forces acting through the relatively dust and rock free space between the arms keep them from blending into each other.

And again we have found an explanation for something that is not easily explained by the standard model. The rope-like structure of spiral galaxies defies the standard model, and the concept of "dark matter" has been introduced to make the theory fit observations. However, given the right properties for the Concave and Convex functions, and keeping in mind that stellar bodies are hollow, and therefore much less massive than generally assumed, there is no need for dark matter. The stable nature of galaxies are likely to be fully accounted for by a further analysis of the maths associated with dipole gravity.

As for the largely dust free space between galaxies, there is nothing to counter the repelling forces, and we have repulsion winning out pushing galaxies apart.

Gravity Between Cosmic Bodies

Having dealt with stellar bodies and stellar bodies interacting with cosmic bodies, we can move on to cosmic bodies acting on each other. And as an example of two such bodies we can take the case of a satellite visiting a small comet, and we will see that the measured gravity between these two objects will be very different from what would be anticipated from the standard model.

Consisting entirely of freely rotating "internal stick magnets", cosmic bodies do not have any moderating functions associated with them and we can conclude that the force acting between two cosmic bodies are defined entirely by the base function:

$$F = B(d)$$

where

- $B(d) = K \frac{M_1 M_2}{d^3}$

In other words, we have the following simple expression governing cosmic bodies interacting with each other:

$$F = K \frac{M_1 M_2}{d^3}$$

The force between two cosmic bodies is determined by the inverse cube law, and is therefore tapering off much faster than would be expected using Newton's Law. And this serves to explain why the standard model predicts comets to be dirty snowballs when in fact they are made of rock.

The low gravitational field of a comet is not due to a lack of mass, it is due to the dipole nature of gravity.

And once this is understood, we see that a satellite flyby of a comet can be used to calculate the value of K in our base function.

Given a good understanding of the composition of a comet, we can estimate its mass and calculate K as follows:

$$K = F \frac{d^3}{M_1 M_2}$$

Black Holes

At this point it is clear that we do not have any need for dark energy or dark matter when we use the dipole model proposed by the Electric Universe. Both phenomena are simply inventions made up to make the standard model work. And by definition, black holes have to go too, since there is no such thing as a point source of gravity in the Electric Universe model.

Black Holes are impossible entities in a dipole universe. And since the function of black holes have been to make observations fit the standard model in much the same way dark matter has been used to make things add up, we must assume that cosmic dust is in fact sufficient to make the Electric Universe model of gravity stand on its own.

The Big Bang

The Big Bang is another invention that seeks to remedy the shortfalls of the standard model, and its purpose is similar to that of dark energy.

Seeing that galaxies recede from each other, there was a need to explain this, and the Big Bang theory was adopted to do that. However, galaxies recede from each other due to the repelling force of gravity at great distances, so the Big Bang has no purpose in a dipole universe.

Furthermore, there is no need for a beginning or an end to the universe where there is a balanced equilibrium between repelling and attracting forces, and the Electric Universe model is capable of providing such a balance, so the whole idea of a Big Bang is no longer needed.

Instead of a Big Bang we can propose a perpetual mechanism where large bodies come into existence through the assembly of smaller parts, and that these large bodies subsequently expended themselves through radiation and outflow of matter which in turn provides building material for a new generation of large bodies, starting the cycle over again.

Such a universe has no beginning and no end, only creation and destruction.

Anti-Gravity

On a final note, we can see that the dipole nature of gravity has in it the elements required for anti-gravity. In fact, we have already concluded that anti-gravity exists between stellar bodies at large and extremely close distances. Gravity that exerts a repelling force is after all the definition of anti-gravity.

However, to produce an anti-gravity device to be used in a flying machine we will somehow have to trick nature. Cosmic bodies will always attract other bodies since their "internal stick magnets" always align with the dominant gravitational field, and it is only by somehow interfering in this alignment process that an anti-gravity device can be constructed.

But since there is no reason to believe that it is impossible to construct a device to manipulate the "internal stick magnets" of matter, we have no reason to believe that anti-gravity devices cannot be made. And we must therefore conclude that the construction of an anti-gravity device is a theoretical possibility that may one day be turned into reality.

Conclusion

Having followed Newton's example in deriving a universal function for gravity, but replaced Newton's point source assumption with the dipole of the Electric Universe model, we have produced three universal functions for the following three cases:

1. Stellar bodies, such as the moon, our planet and our sun interacting with each other
2. Stellar bodies interacting with cosmic bodies such as dust, rocks and satellites
3. Cosmic bodies interacting with each other

These functions all have a base function $B(d) = K\frac{M_1M_2}{d^3}$.

The first function has a moderating function that we have called Complex, the second function has a moderating function that we have called Combined, while he third function does not have a moderating function.

The moderating functions are based on the geometry of stellar objects, with a function we have called Concave applying to concave surfaces, and a function we have called Convex applying to convex surfaces.

While both the Concave and the Convex function moderate the base function in a focusing manner, the Concave function has a stronger focusing ability than the Convex function.

The parameters used to determine the value of Convex and Concave for a stellar body at any given distance from another body are:

1. The radius "ro" from the geometrical center to the outer surface of the stellar body
2. The radius "ri" from the geometrical center to the inner surface of the stellar body
3. The radius "cg" from the geometrical center to the center of gravity of the stellar body
4. The distance "d" between the geometric centers of the two bodies involved

For stellar bodies interacting with each other we derived the following function:

*F = Complex() * B(d)*

where

- *Complex() = Concave(1)*Convex(2) + Convex(1)*Concave(2) - Convex(1)*Convex(2) - Concave(1)*Concave(2)*
- $B(d) = K\frac{M_1M_2}{d^3}$

The numerical values 1 and 2 of the Concave and Convex functions refer to the bodies M1 and M2 in the base function B(d). Concave(1) is shorthand for Concave(ro1, ri1, cg1, d) and Convex(2) is shorthand for Convex(ro2, ri2, cg2, d), etc.

For stellar bodies interacting with cosmic bodies we derived the following function:

*F = Combined() * B(d)*

where

- *Combined() = | Convex(1) - Concave(1) |*
- $B(d) = K\frac{M_1 M_2}{d^3}$

For cosmic bodies interacting with each other we derived the following function:

F = B(d)

where

- $B(d) = K\frac{M_1 M_2}{d^3}$

And from this we arrived at the following conclusions:

1. Stellar bodies repel each other at large distances
2. "Dark energy" is gravity acting in a repelling manner between stellar bodies at great distance
3. Stellar bodies repel each other at very close distances, preventing them from colliding
4. There is a maximum and a minimum size to stellar orbits depending on the size of the orbiting bodies
5. Mercury's non-Newtonian behavior is due to it being close to the inner limit of allowed orbits around the sun
6. There is a region of zero net gravity for dust and rocks located somewhere between the Asteroid Belt and the Kuiper Belt
7. Dust and rocks do not generally orbit the Sun at the same rate as planets
8. The Kuiper belt and the Asteroid belt are the only two regions where dust and rocks orbit the Sun at the same speed as planets
9. Other solar systems are likely to possess two asteroid rich regions, just like our own solar system
10. Comets do not follow perfect ecliptic paths
11. The "Oort Cloud" does not exist
12. The Pioneer anomaly is due to non-Newtonian gravity effects beyond the Asteroid Belt
13. Flyby anomalies are due to non-Newtonian gravity effects close to stellar bodies

14. "Dark matter" is dust and rocks acting as glue to hold galaxies together

15. Comets are more massive than standard theory predicts

16. "Black holes" do not exist

17. Cosmos is infinite in time and there was no "Big Bang"

18. Anti-gravity devices are theoretical possibilities

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