REVISING THE TOPOLOGY OF THE EARTH

Essay Abstract
The spherical model of the earth is 3 dimensional despite general relativity's addition of the fourth dimension (time) and experimental evidence that extra dimensions from other dimensional fields e.g. quantum space and scalar fields impacts on it s topology. The paper therefore wishes to dispel the assumption that the earth or other heavenly body is spherical.
It shows that, whereas the surface area, volume, density and mass remain as established, the ultimate shape is actually the result of cumulative flat hyper-planes with tangent vectors extending to infinity. This resolves various physical contradictions relating to a spherical earth. It also supports the theoretical frameworks for existence of extra-dimensional quantum fields just below matter, throughout empty (vacuum space) and outside of space-time. This operational area for quantum waves and universal inflation is not amenable to physical measurement or exploration because its infinite number of singular dimensions ,extents and directions means the dimensions intersect everywhere with no distance between one intersect(field) and another. Thus away from the space-time continuum where speeding matter is superimposed on a finite number of dimensions, there is no space or time. Quantum particles propagate as waves in the scalar field below the universal space-time, creating individual space –time continuums with length: λ.
By the same logic, the universal space time continuum is a wave with uneven λ= diameter or longitudinal length of the earth, or other heavenly body.
By the *principle of equivalence*, quantum waves and universal inflation generate electromagnetism and quantum- gravity respectively.

Author's Bio
Wanjohi, P.W. did advanced level physics but is a health professional specializing in community health and development .Works with the government and development partners. As a freelance physicist, he is a published researcher. His wish is top see a public well knowledgeable of their physical, biological and chemical environments.

INTRODUCTION

Physics, the most fundamental physical science, is concerned with the basic principles of the Universe. It is the foundation upon which the other physical sciences - astronomy, chemistry, and geology - are based. The beauty of physics lies in the simplicity of the fundamental physical theories and in the manner in which just a small number of fundamental concepts, equations, and assumptions can alter and expand our view of the world around us (Serway & Jewett 2004, 1). [1] Like other branches of science, physics is based on firm logical foundations as well as some assumptions and constants made for convenience, insufficient grasp of basic principles, or because they are considered to be obvious.
In logic an **assumption** is a proposition that is taken for granted, as if it were true based upon presupposition without preponderance of the facts. An assumption that is considered to be self-evident or otherwise fundamental is called an axiom.
In natural deduction systems, an *assumption* is a proposition that may be used to prove further propositions, in the expectation that the assumption will be *discharged* in due course by proving it via a separate argument.
Mathematical modeling can be used to map the outcome of different assumptions on the system being modeled.

In general, mathematical models may include logical models, as far as logic is taken as a part of mathematics. In many cases, the quality of a scientific field depends on how well the mathematical models developed on the theoretical side agree with results of repeatable experiments. Lack of agreement between theoretical mathematical models and experimental measurements often leads to important advances as better theories are developed. Occam's razor is a principle particularly relevant to modeling; the essential idea being that among models with roughly equal predictive power, the simplest one is the most desirable. While added complexity usually improves the realism of a model, it can make the model difficult to understand and analyze, and uncertainty increases due to an overly complex system, where each separate part induces some amount of variance .Thomas Kuhn argues that as science progresses, explanations tend to become more complex before a Paradigm shift offers radical simplification (Kuhn, Thomas S. 2012, Ian Hacking intro.).[2] However to realize a paradigm shift, the evaluation of whether or not a given mathematical model describes a system accurately is important. Usually the easiest part of model evaluation is checking whether a model fits experimental measurements or other empirical data (Yang, X-S 2008, 3-5). [3]

Take the standard model for example. While applicable at subatomic level, it breaks down at macroscopic scales because of some age-old assumptions about the physical nature of the world which I think hold no water. In 1998/99, Merab Gogberashvili showed that the Universe could be a thin shell (a "brane") expanding in an extra- dimensional field (Gogberashvili, 1998, 1-2). [4] So far no experimental or observational evidence of the extra- dimensional field has been officially reported.

Nevertheless if the idea is viable or could be developed further, the visible, 3-1 dimensional space and matter are within a brane inside an infinite extra-dimensional field, variously referred to as *'quantum space' (*Oriti, 2011,1)[5] *'Quantum vacuum'* (Millonni,1994, 52-53)[6], *'Dirac sea'* (Galison, 2000,145)[7], *'latent scalar field'/ 'connectivity dimensionality field'* (Manz, 2012,1-9) [8], and *'heavenly realm'* (Abraham,2005,108)[9] is the subtle veritable paradise of physics, orchestrating all weird and magical physical phenomena including, but not limited to , wave/particle Duality, Invariance of the speed of light, Quantum Probability & the Measurement Problem (limit of physical measurement), Uncertainty Principle , Quantum Entanglement & Non-locality (spooky action at a distance), String Theory / Superstring Theory / M-Theory (which postulate that matter is nothing but vibrating superfine filaments of energy) , and Quantum Consciousness **(**which postulate that consciousness has a link to the strange quantum realm).[10] Supposing the observed space and matter also contains the extra dimensions, and that the extra- dimensional field is infinite, with other branes moving through the multiverse, do interactions with the said field and possibly with other branes, influence our brane, introducing effects not seen in the usual topological or standard models, or are the other branes mere photocopies of our own meant to operationalise various probabilities? This would necessitate the discarding or modification of certain physical *assumptions e.g.:*

That the Earth is spherical

A major candidate axiom for modification is the centuries – old assumption that the earth or other 'heavenly' body is self-evidently spherical. Ever since Columbus reached the shores of Latin America and assumed he had stumbled on India after sailing westwards rather than eastwards, which ensured that the flat earth, precipice- at- the- horizon world-view was relegated to childish nightmares, a spherical 3-dimensional earth-model has dominated our world-view. So much so that even after science moved on to 4 dimensions, warped space and Riemannian geometric models of nature, nothing, it seems, will ever compel us to revise the three-dimensional Euclidean space-earth model.

How could anyone, let alone a physicist, begin to question something as obvious as the spherical shape of the earth! Columbus et al proved it by sailing around the earth, satellite pictures clearly show a spherical earth, astronomers clearly see spherical planets, moons, sun, stars, black holes etc.

Ordinary observers can see the earth curvature beyond the horizon. I mean, even kindergarten kids would laugh you out of the classroom if you taught anything contrary to the known spherical model of the earth that has pride of place at their activity table! But science is not a doctrine to brook no dissent. Indeed, great strides in science are achieved through the cumulative knowledge gained from questioning facts that initially or for eons appeared obvious.

Therefore even the seemingly obvious earth topology cannot avoid a critic's eye. Reason is, there are various self-contradictions inherent in the model.

That the sea-level is curved

The assumption that the sea level is actually spherical seems obvious because the massive water bodies are wrapped around a seemingly spherical earth. An observer at the shoreline looking across the sea/lake/ocean or observing from the midst of the water body sees the distinct curvature of the sea level at the horizon. A ship or other water craft cruising away will seem to sink into the horizon, confirming that the sea surface, though level, is ultimately curved.

It's hard to argue against this apparent common sense reasoning. But a closer look reveals several physical inconsistencies in the assumption.

If it were a true curvature, then a submerged vessel or fish etc moving in a straight line parallel to another straight line above the water surface would involuntarily exit out of the water at the point his straight course meets the curved water surface. This is because the straight course would form a section connecting two ends of the arc of a circle circumscribing the earth's sphere.

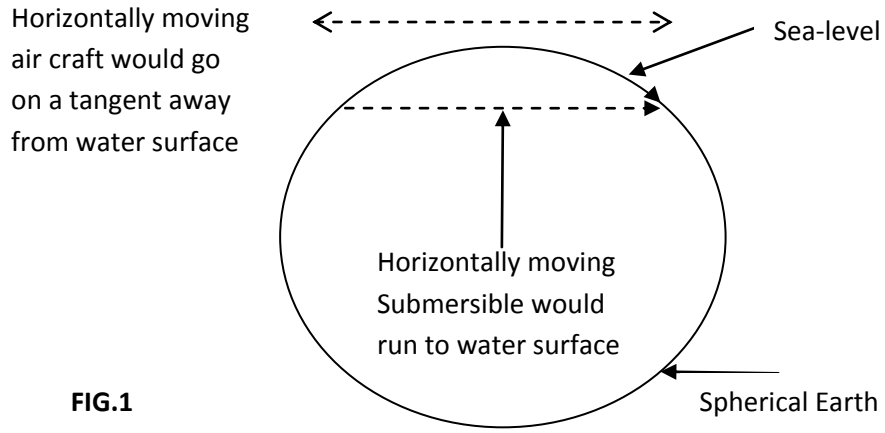

FIG.1

An aircraft auto piloting horizontally, parallel to a spherical water surface, would be expected to go off on a tangent away from the curved water surface, but this does not happen. Instead the aircraft, without any voluntary guidance, stays parallel to the water surface. And so would a sea-eagle or other bird gliding effortlessly above the sea-level.

Observing through periscopes and binoculars aboard sea vessels one would also able to 'see' beyond the horizon and espy other vessels and activities far away beyond the curve of the water surface horizon, yet we know that light travels in straight lines. It would be hard for such instruments to 'see' down below the horizon were the earth/sea surface a true curvature.

It is therefore paradoxical for the surface of seas/oceans around the earth to be curved and yet retain a level character. If we retain the axiom of water keeping its own level, then we cannot retain the contrary maxim that the earth is a sphere. Else, how can a water body that wraps around a sphere keep its own level?

It might be argued that the constant force of gravity enforces this 'level' curvature of waters around the earth. Until you encounter an engineering paradox:

Architecture and civil works

The spirit/water/light 'level' is an indispensable tool for architects, builders, civil and linear development engineers. It establishes firm, level and constant baselines for structural stability of buildings, roads, railways, bridges, airports etc.

Ideally, were such 'level grounds' actually spherical, adjacent skyscrapers would be expected to diverge away from each other as their heights increase. Such 'leaning towers' would not only be most unstable but also impossible to put up in the first place. To test the hypothesis as to whether the 'level' is actually spherical or flat, we can measure the exact distance between two skyscrapers at the ground level and then from top of building to the top of the other building. The results thereof are expected to show a divergence attributable to the earth surface curvature.

If as suspected there is no divergence, the earth's spherical curvature is an appearance/assumption that is hard to defend as a scientific fact. Either way, we may go ahead and construct a hypothetical world wide house/building, which spans the entire world. We first establish a baseline by leveling out the world-wide site using water and spirit level, which utilize the principle that water or other fluid keeps its own level. Secondly we erect pillars across the flattened earth surface and develop them upwards to any desired height. Then we try to cast beams from pillar to pillar across the earth. If the earth were spherical, it is impossible to cast the beams because the pillars are not upright nor right angled in relation to a spherical earth surface. The experiment could only produce a structurally sound house only some way across the earth as the two extreme ends of the earth sphere and the opposite side of it would require separate leveling jobs. Thus the project would come up with a four sided structure. This is the engineering quagmire of a spherical three-dimensional world.

Our preoccupation with this kind of topological model has endured; long after relativity established irrefutably that space is four dimensional and not three. The practical implications of a four dimensional space-time has failed to register on our collective and scientific radar and is discussed only as abstract theory.

A plausible 4-D earth space-time model

It is with this quagmire in mind that a possible 4-D space-time model is suggested.

The model is directly derived from General Relativity (GR) which presupposes a Riemannian geometry, which is higher dimensional than the more familiar 3-D Euclidean geometry. GR could never be understood in a 3-D geometry because it incorporated time as a physical dimension. Therefore, space which was 3-D acquired a fourth dimension. However, despite the realization that time is a dimension of space just like length, breadth and height, there is scant understanding of the physical implications of a 4-D space, hence the disjointed designation 'Space-time'. It is like we are saying that though time dimension is part of space we want to think of them as separate entities.

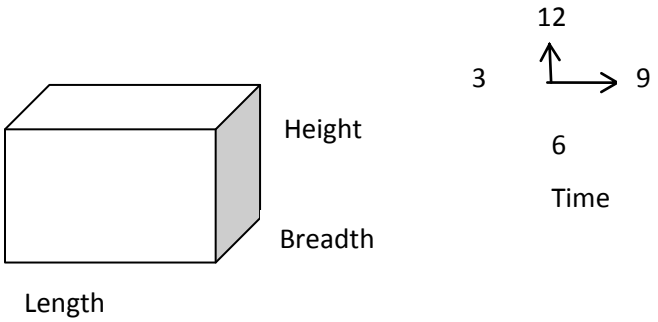

FIG 2

The mathematical *Minkowski space* was the earliest treatment of space and time as two aspects of a unified whole.GR further combined space and time dimensions into one physical continuum but the true ramifications of this development is poorly understood.

In 1919, an expedition by British astronomers conducted a famous experiment, during a solar eclipse in the island of Principe in West Africa, which confirmed the GR theory that heavenly bodies modify the geometry of space around them, causing curvatures. In that particular experiment, distant stars shifted from their actual positions during the eclipse. Actually it was light from the stars that now took the shorter central route through the cone-shaped curvature of space around the sun when the glare of the sun became diminished (Einstein, Albert, 1920). [11]

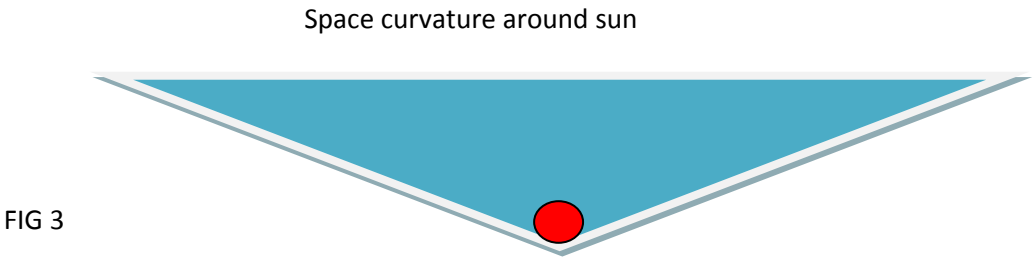

FIG 3

Scarcely remembered is the fact that the earth, or any other heavenly body and matter thereof, is part and parcel of space, and not a body superimposed or weighing down on a threadbare canvas of called space. The space –time continuum suggest a 4-D superstructure and not a thin canvas where matter-containing bodies are suspended. Matter is defined as anything that has mass and volume, which therefore *occupies* space.

We all are contained within the space-time and not on top of it as depicted in most space-time illustrations. (See FIG 4 below) (Wikipedia, 2012). [12]

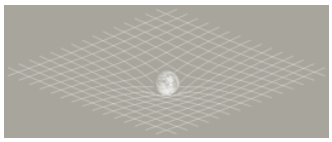

FIG 4

Of more relevance to the discussion is the possibility that apart from deforming the space around them,heavenly bodies like the earth ,sun and the moon also deform themselves along the same lines as the deformed space .This is because matter is a necessary ingredient of space.

Massive celestial bodies are the cornerstones of space.In the absence of the Big Bang which brought about matter,there was and would be no space, time or anything else.

However, the concept of spherical heavenly bodies within a space-time frame does not add-up.

Anybody at the poles would find themselves outside of the space –time continuum.

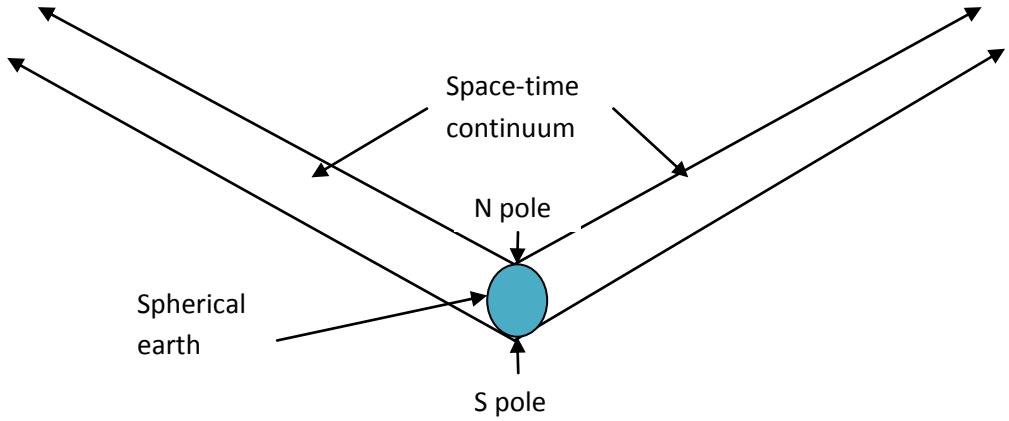

FIG 5

To cure this and other spherical earth problems enumerated above, we can treat the longitudinal world lines as the spatial lines of the temporal 4th dimension of space.This would not be strange considering that, even now, we use longitudes to determine time zones around the world.We therefore can use them to create the time dimension of the earth.If we then factor in a straight outward motion of the space-time continuum(expanding universe), in addition to the planet's revolving and revolutionary motion around its axis and round the solar system (motions which create the daily and annual units of time on earth) , then we have a preliminary geometric construct of a 4-D earth(FIG 6).

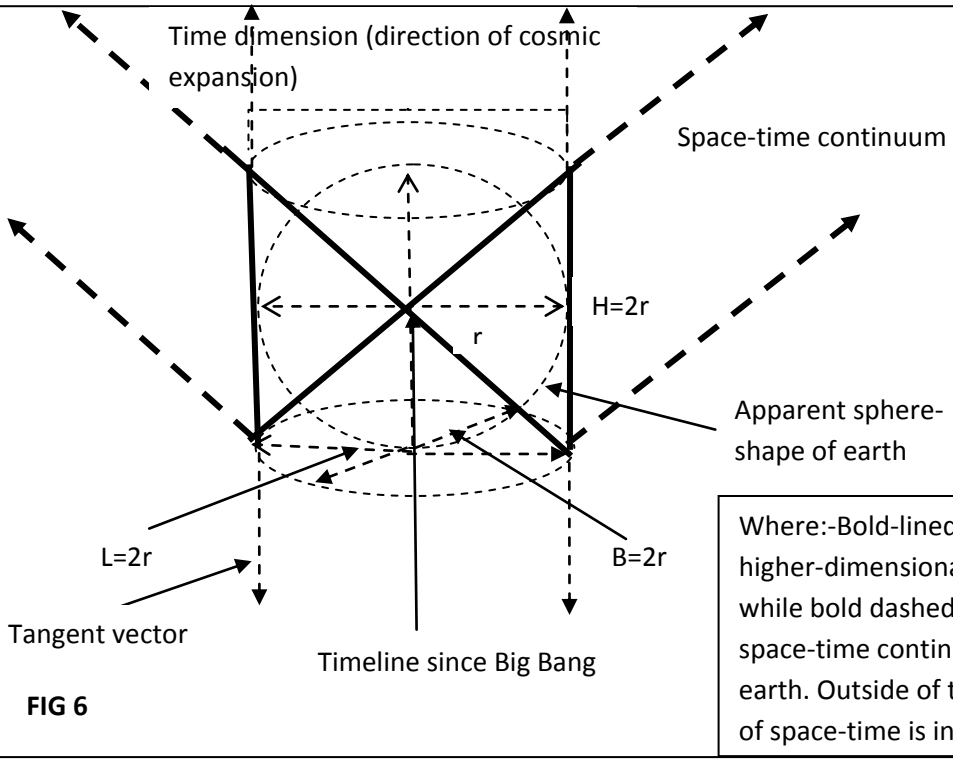

FIG 6

It is imperative to show here how the proposed higher- dimensional earth model conforms to the known surface area mass and volume of the planet or other heavenly body.

According to Archimedes, surface area of a sphere = Curved Surface Area (CSA) of a cylinder. Now the 4-D model assumes a cylindrical helix shape because latitudinal lines and other geodesics become straight, opening up dimensions of infinite nothingness in every direction. These countless dimensions enables us to have a spherical world that is also flat and whose surface area satisfies the formula $S=4\pi r^2$ for a sphere as well as CSA of a cylinder.

Now, volume of a sphere = $\frac{4}{3}\pi r^3$

And that of a cylinder = $\pi r^2 H$ = AH where A= area of base of cylinder, and H is for height.

And volume of a cone = $\frac{1}{3}$AH,

We subtract the volume of the 'empty' upper and lower cones of the cylinder i.e. $2(\frac{1}{3}\pi^2 \frac{H}{2})$

And find that $\frac{4}{3}\pi r^3 = \pi r^2 \cdot H - \frac{1}{3}\pi r^2 . H$.

Substitute double radius 2r for H:

$\frac{4}{3}\pi r^3 = \pi r^2 . 2r - \pi r^2 . 2r$

i.e. $\frac{4}{3}\pi r^3 = 2\pi r^3 - \frac{2}{3}\pi r^3$

Thus $\frac{4}{3}\pi r^3 = \frac{(6\pi r3 - 2\pi r3)}{3} = \frac{4}{3}\pi r^3$

Thus the known volume and surface area of the earth remains as that of a sphere, even when its topology is modified.

The change-over is important because the 4-D space-time coordinate grid of the new topology will locate events (rather than just points in space).Time becomes another dimension to the coordinate grid. This way the coordinates specify *where* and *when* events occur. The time coordinate will indicate the general location of the universe away from the Big bang (BB) epicenter while the other coordinates indicates the exact location within the universe.

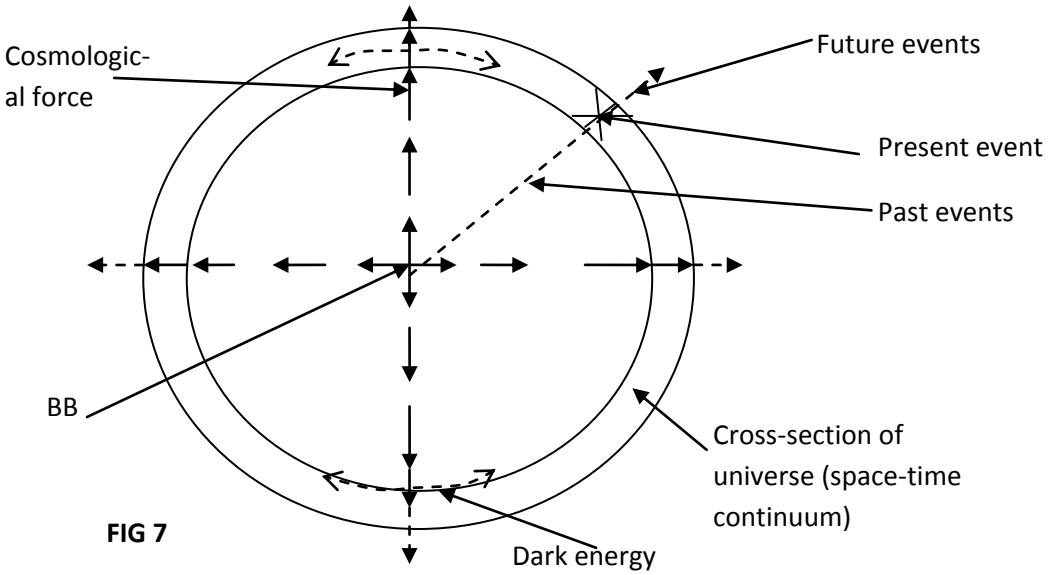

FIG 7

Our curved/flat earth topology can be described mathematically as a 4-dimensional manifold for which the tangent space (hyper-plane) to any point is a 4-dimensional Minkowski space (Walter, Scott, 1999, 45–86).[13]

The said hyper-planes have centers at every point of the earth surface, with the diameters of each of the circular hyper-planes being the initial (real) tangent vectors and equal to the diameter of the earth.

At the boundaries of the hyper-planes, the tangent vectors extend to infinity in a manner similar to the time-like vectors arising from longitudes as shown earlier (FIG 6).

In this way an eagle or aircraft is able to fly effortlessly in a straight line around the earth, the sea is level and therefore a fish or submarine can cruise down under without fear of running onto the surface of a curved sea surface, building structures and civil works can be structurally sound because they are horizontally level and vertically straight.

The existence of more than four dimensions at the subatomic level is predicted by String theory and M-theory. Possibly the re-thinking of the spherical models of atomic and subatomic particles could clarify the matter. This would include the use of flat Minkowski space vector fields to replace spherical standard models. It would show that particles that have some mass e.g. electrons, protons and neutrons also deform their geometries and depress space around them, creating the gravity that hold subatomic particles together. It would also open up the quantum world of infinite possibilities to more understanding (see notes).Here, emitted particles form their own space-time continuums (waves) as they propagate at the speed of light C.

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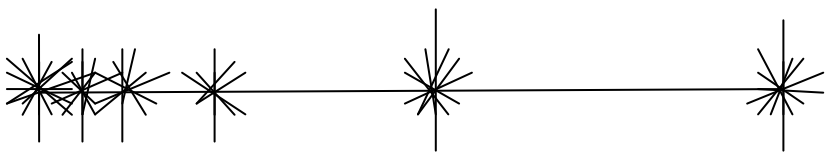
TECHNICAL END-NOTES

The paper dwelt at length on how extra-dimensions can be used to reformulate the geometry of earth and other heavenly bodies. The concept of the universe being a thin shell (brane) propagating within an extra-dimensional field of infinite nothingness was alluded to. Why are the spatial dimensions of a field so magical and important - being the substrata of existence - equal to zero, so that it renders itself physically inaccessible?

Dimensions are defined as independent components of a coordinate grid needed to locate a point in a certain defined "space". A single dimension is pure and lucid, without any matter or space whatsoever. Only where two or more such dimensions meet is space and matter possible. An example is the 3-D space where 3 dimensions enclose space where and all physical action take place. A fourth dimension (time) describes the duration when the space and matter therein exists. This is the duration of motion of the existential framework (space-time continuum). This motion results to universal inflation because the space-time continuum is spherical.GR shows that masses of matter, e.g. heavenly bodies, determine the finer details of the space-time continuum by depressing it according to the mass of each such body. As we have seen, the three spatial dimensions of space cannot adequately describe the geometry of the earth or other heavenly body, mainly because physical experiential and experimental data contradict the 3-D model. By straightening out all geodesics, we created extra dimensions including that of time resulting into a world of infinite 4-D hyper planes (vector fields) with tangent vectors extending to infinity. Successive hyper planes cumulatively create the illusion of a curved spherical earth. However, the distances between straightened out longitudes at the earth poles and that between hyper planes on opposite sides of the earth is zero. These are the boundary regions of the space-time continuum outside of which infinite dimensions of infinite extent from infinite number of directions converge at infinite number of coordinate points (fields) where they nullify each other the way infinite negative and positive energy cancel out each other in vacuum space (see Free pdf copy of *The Structured Vacuum - thinking about nothing* by Johann Rafelski and Berndt Muller (1985) ISBN 3-87144-889-3).



Progressively reducing distances between coordinate convergence points for infinite number of single dimensions. Because such points are everywhere within the connectivity field, distance between any such two points is zero. Hence there is no space or time. One can be in all places at the same time (entanglement/non-locality).

However, physical objects which occupy several dimensions at once, and are in real-time motion, create transitory space between them (space-time continuum).Nevertheless, the infinite connectivity field still exists beneath the empty space between objects and particles and through them, within the confines of the space-time continuum. This is the quantum space where freed subatomic particles operate as waves with intrinsic wavelengths for:-

(a) Photons: $\lambda = \frac{h}{mc}$

(b) Particles: $\lambda = \left(\frac{h}{mv}\right)\left(\frac{1-v^2}{c^2}\right)^{1/2}$

Where h=Planck's constant

M= mass,

V=velocity, and

C= speed of light

A wave is a local space-time continuum applicable to a discharged photon or other subatomic particle with length λ.

The universe is a collection of heavenly bodies containing non-discharged quantum particles and which, in tandem, creates a wave (space-time continuum) around the universe with local wavelength equal to the diameter or longitudinal length of the body e.g. earth and operating within the wider extra-dimensional field (multiverse?).

By the *principle of equivalence*, quantum waves and universal inflation generate electromagnetism and quantum gravity respectively.

Finally due to the weighty specificity of allegations made by in this paper against the current topological models of the universe in general and spherical earth model in particular ,a study to determine the perimeter of a cross -section of the earth slightly above the earth and similar measurement on celestial spheres around the earth need to be conducted. The study would once and for all prove or disapprove the hypothesis that the earth topology model is spherical. If perimeter near the earth surface and that high above the earth are equal, then the hypotheses that the earth is proved.

I have always wanted to conduct this experiment but technical and material support has been hard to come by. Probably there are volunteer scientists, engineers, pilots, financiers, research and teaching institutions e.t.c. out there that would be willing and able to support or conduct this or any other appropriate test for this hypothesis.