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A Conjecture: The Theory of Existential Relativity

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Abstract: In this conjecture, the term '**consciousness**' signifies a specific state of existence or being, and each '**domain of consciousness**' contains a complementary and analogous spectrum of existential patterns, such as (a) the sub-microscopic '**Quantum domain**', (b) the observable '**Datum domain**' and (c) the omnipresent '**Cosmological domain**'. This novel '**Theory of Existential Relativity**' (**TER**) proposes that the nature and analogous state of each *'consciousness'* or *'pattern'* is periodic and is positioned on the ER-scale by a simple logarithmic equation, which has as its base, a constant 'λ', called the '**Existential Relativity (ER) Constant'**, and its value is approximately equal to 10^{23}, which is obtained by an inspection of the progression of these analogous states of existence. The conjecture draws on the principles of periodicity to present a framework based on analogy to debate the existence of complementary patterns of consciousness that transcend the observable states of existence in our 'Datum Domain', in either direction of (a) the 'Cosmological domain' which encompasses the space between the outer bounds of our 'Solar System to the outer bounds of our known universe, on the one hand, and (b) the sub-microscopic 'Quantum domain', between the 'Atomic Plane' to the 'Plane of Grand Unified Theories', on the other hand. This approach is extended to propose and model the existence of dimensions beyond the four 'space-time' dimensions that are currently known.

Keywords: cosmological applications of theories with extra dimensions, cosmology with extra dimensions, extra dimensions

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1. Introduction

That periodicity is a natural law has perhaps been best expressed by Marcus Aurelius, who said (in the second century AD):

Each thing is of like form from everlasting
and comes round again in its cycle.

Physicists, geologists and historians have leaned on the concept of periodicity as they contemplate the origins of the Universe, the Earth and – more recently – the saga of human civilization. When Dimitri Mendeleyev used his famous 'Periodic Table' to predict undiscovered elements, it ushered in a fundamentally new framework for understanding nature. Today, chronobiologists cite the rhythmic circadian (Latin for 'about one day') patterns in many biological phenomena to explain why living organisms do virtually everything cyclically. In this conjecture, we shall draw on the periodicity of existential patterns to explain cosmological and quantum phenomena, and to predict the existence of discrete existential patterns that are analogous to our own observable states in the here and now.

2. Conjecture

The Theory of Existential Relativity (TER), depicted pictorially in figure 1, is based on the conjecture that existential patterns are predictably periodic, and in this paper:

a) The term ***'consciousness'*** signifies the pattern of a specific state of existence or being, symbolically depicted along the gray line with images of entities that we are familiar with, e.g. the sun, earth, a girl child, the atom and so on;

b) The size of the entity or 'consciousness' is based on **linear measurements**; for example, the height of a girl child is of the order of 1 m, whereas the diameters of an atom, the earth and the sun are of the order of 10^{-10} m, 10^{7} m and 10^{9} m, respectively; these linear measurements are expressed in terms of a new unit of measurement, defined as: $\delta = 10^{-10}$ m (the representative diameter of an atom);

c) Each ***'domain of consciousness'*** contains a complementary and analogous spectrum of existential patterns; three such domains—***'Quantum'***, ***'Datum'*** (which contains the observable items listed in b) and ***'Cosmological'***—are shown in figure 1;

d) The ***'Atomic Plane'*** (conforming to Dalton's Atomic Theory) is the ***'Datum Plane of Consciousness'***; the linearized ER scale (shown vertically left of middle in the figure) and the linear dimensional comparisons (horizontally) are measured with respect to this datum plane.

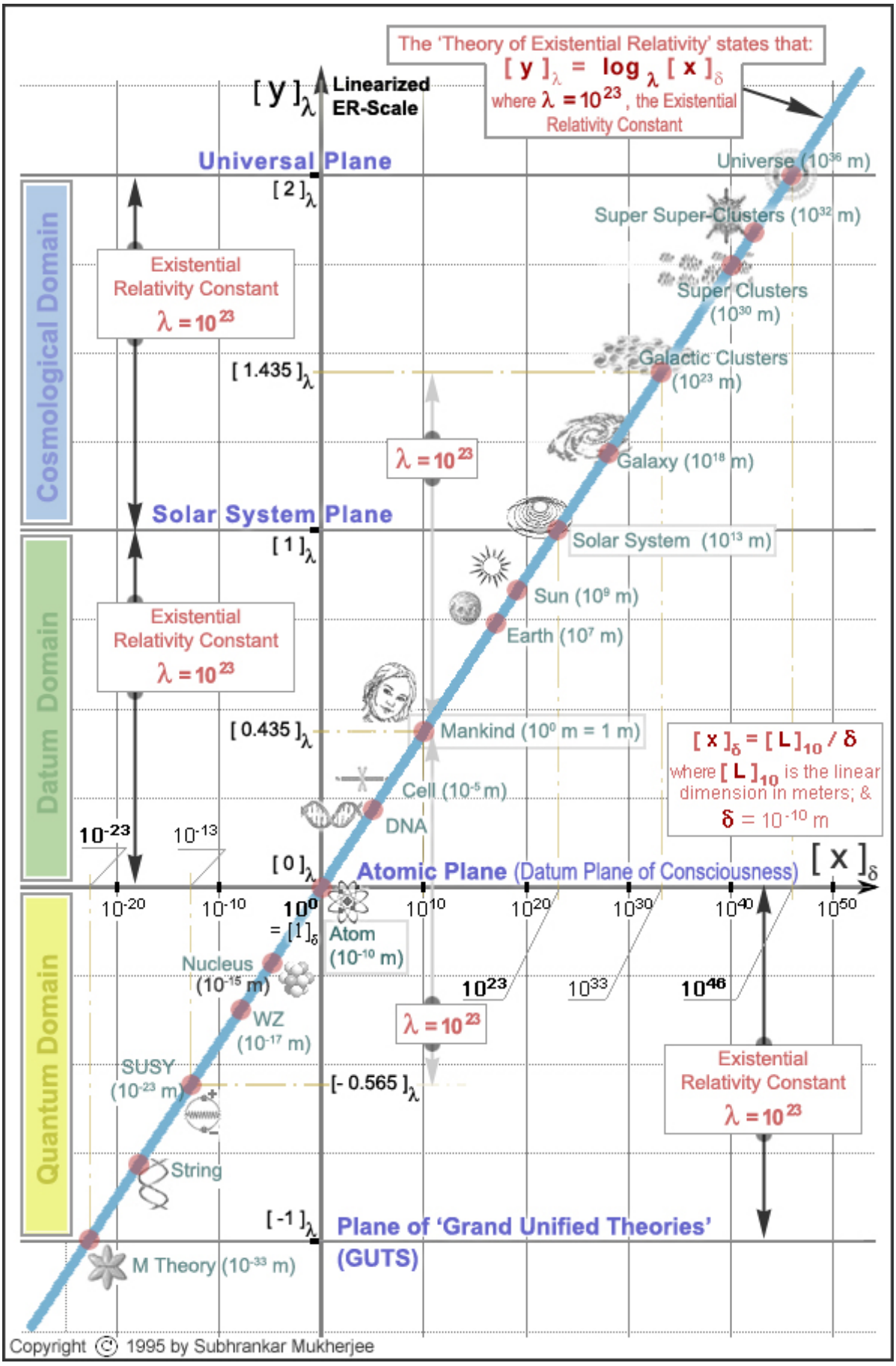

Figure 1. A pictorial depiction of the **'Theory of Existential Relativity'**

The atom, which has a diameter of the order of 10^{-10} m, is the primary model of reference. Accordingly, the unit of measurement of linear distances is 'δ' = 10^{-10} m. When a linear dimension, measured in meters, is divided by this elemental unit of measurement, 'δ', we may derive its measure along the horizontal $\mathbf{[x]_\delta}$ axis. For example, the size or linear measurements (such as height or diameter) of three of the cardinal patterns of consciousness that are observable to us in the 'Datum Domain' may then be expressed in terms of this new unit of measurement and the simple logarithmic equation defined in equation (1) as follows:

(a) The atom—which has a diameter of the order of about 10^{-10} m— is therefore one unit of 'δ'; since the log of the number '1' to any base is zero, the atom is at the origin of the graph, measuring at '**1**' unit on the horizontal $\mathbf{[x]_\delta}$ axis, and $\mathbf{[0]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis, where the subscript 'λ' refers to the 'Existential Relativity Constant' and its significance will be explained after Figure 1;

(b) The girl child—with a height of the order of about 1m—is $\mathbf{10^{10}}$ units on the horizontal $\mathbf{[x]_\delta}$ axis, and maps to $\mathbf{[0.435]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis; and

(c) The 'Solar System'—which has a diameter of the order of about 10^{13} m—is $\mathbf{10^{23}}$ units of 'δ' on the horizontal $\mathbf{[x]_\delta}$ axis, and maps to $\mathbf{[1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis;

Other intermediary observable forms, such as human cells, the 'Earth' and the 'Sun', are of the order of 10^{-5} m, 10^{7} m and 10^{9} m, respectively, and are therefore represented by 10^5, 10^{17} and 10^{19} units of 'δ' on the horizontal $\mathbf{[x]_\delta}$ axis, which maps to $[0.217]_\lambda$, $[0.739]_\lambda$ and $[0.826]_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis, respectively, based on the logarithmic equation (1), which is the basis for explaining the physical analogies shown in figure 1 and described in the following pages.

The 'Solar System Plane', defined in figure 1 as $[1]_\lambda$ on the ER-scale, marks the upper boundary of the 'Datum Domain'. We know that the solar system consists of planets encircling the sun-star. The 'Atomic Plane', defined as $[0]_\lambda$, is at the lower boundary. Dalton's Atomic Theory explains that the atom, too, has a nucleus with orbital electrons encircling it. There is at once a physical analogy between the solar system and the atomic structure. This would suggest that (a) the structure of patterns at the boundary planes resemble the 'heliocentric' solar system or atomic structure, with 'planets'/'electron'-like objects circling a central 'sun'/'nucleus'-like anchor and (b) we may draw physical and structural analogies between the patterns and states of consciousness in the intermediary stages, which aid in visualizing and strengthening the analogies towards laying the foundations of the Theory of ER.

Arguably, planetary orbital patterns and the planets themselves are physically different from each other. But is each electron identical? Heisenberg's '*Uncertainty Principle'* makes it impossible for us to ascertain the physical characteristics of each electron encircling the atomic nucleus. It is also illustrative to note that eminent scientists believe that Hydrogen atoms, like Gulliver and the Lilliputs, may exhibit gigantism amongst themselves. Thus, it is not the contention of the Theory of Existential Relativity that analogous states in its periodic chain are merely optical magnifications of one another by the ER-constant: $\lambda = 10^{23}$; just as the physical dissimilarities of the Group I elements - Sodium and Potassium - do not detract from the elegant deductions made possible by Mendeleyev's Periodic Table, because these two elements predictably display similar (or analogous) chemical characteristics.

For example, directly above the 'Atomic Plane', we obtain a complex molecular pattern of existence, signified by spiral, helical clusters of atoms, called 'Deoxyribonucleic Acid' (DNA), which provides the blueprint for life forms. Its direct, physically analogous counterpart in the 'Cosmological Domain' is the galactic stellar constellation, such as our own galaxy that also exhibits a spiral structure, as does the DNA. As we proceed forward with this analogy, we ask the question: Is it therefore conceivable that atom/DNA is to solar system/galaxy as human beings are to a dynamic, throbbing 'Cosmological Super-Man'—in the form of 'Galactic Clusters'? Perhaps not exactly akin to ourselves in our own 'Datum Domain' - *since we live in a three dimensional world* - but in a *fourth time dimension in the 'Cosmological Domain'!*

In figure 1, this equation is indicated by the markings on the $[y]_\lambda$ axis between the icon of a little girl measuring $[0.435]_\lambda$ on the ER-scale to the icon of 'Galactic Clusters' measuring $[1.435]_\lambda$; their maps separated by $[1]_\lambda$ on the ER-scale, where $\lambda = 10^{23}$. Adhering to the principle of periodicity, we may conjecture that a parallel 'life-form' will also exist in the 'Quantum Domain', in the plane of Super Symmetry (or SUSY) at $[-0.565]_\lambda$ on the ER-scale, exactly one ER constant below 'humankind', as shown in figure 1 - *but this time, its existence in the 'Quantum Domain' is conjectured to be in two dimensions, only*. The impact of these conjectures will be examined in greater depth in the following pages.

3. The Theory of Existential Relativity (ER)

The **Theory of Existential Relativity** (**ER**) conjectures that the nature and analogous state of each *'consciousness'* or *'pattern'* (depicted symbolically along the sloping blue line in figure 1) is periodic and may be numerically defined on the ER-scale by the set of simple equations defined below:

$$[\,y\,]_\lambda = \log_\lambda [\,x\,]_\delta \qquad (1)$$

$$\text{and } [\,x\,]_\delta = \frac{[\,L\,]_{10}}{\delta} \qquad (2)$$

where λ = 10^{23}, the "Existential Relativity Constant";

$[\,y\,]_\lambda$ = The transposed position of a pattern or 'consciousness' onto the vertical linearized 'ER-Scale' (shown left of middle in Figure 1), which is computed on the basis of the logarithmic Equation 1 above, with a base of $\lambda = 10^{23}$; hence the subscript 'λ';

$[\,L\,]_{10}$ = The physical, linear dimension of the pattern or 'consciousness', measured in 'meters' in the conventional decimal system (and hence the subscript '10');

δ = 10^{-10} m (the size of an atom); it is a new unit of measurement that has been derived from the linear dimension of an atom, with reference to the 'decimal' horizontal scale of measurement on the '$[\,x\,]_\delta$' axis;

$[\,x\,]_\delta$ = The ratio of the physical, linear dimension of a pattern or 'consciousness' to this new unit of measurement, defined as 'δ', and hence the subscript 'δ'; the number is therefore effectively a multiplier which describes the ratio of the actual linear dimension of an object to the diameter of an atom.

Whether this periodicity is bounded to a finite number of levels (as in Mendeleyev's Periodic Table) or continuous (analogous to circadian rhythms that recur in time) is part of this conjecture and shall be addressed later in this paper. Meanwhile, we observe that the periodicity of analogous levels of consciousness in the 'Theory of Existential Relativity' that is pictorially depicted in Figure 1 partitions space into a window of three distinct domains, when viewed as a human observer on Earth, as defined below:

- **Cosmological Domain**: The expanding Universe, as proposed by 'Big Bang' theorists, which manifests gravitational effects, and where the uncertainty principle is negligible;
- **Datum Domain**: It is the 'here and now' - and most amenable to conceptualization because it is directly observable and constantly evolving right before our eyes; and
- **Quantum Domain**: The sub-microscopic domain of elementary particles, where the uncertainty principle is dominant and inter-particle gravitational forces are minor.

To prove the conjecture, we will first explore the periodicity and analogies between natural observable phenomena, in order to lay the foundations of the theory. When these have been sufficiently established, we will then make conjectures on the existence of unobservable[1] states and patterns of existence that will provide explanations for many cosmological and hitherto contradictory scientific observations.

4. Reflections on the 'Theory of Existential Relativity'

Researchers in astronomy and nuclear physics have already established the thematic interdependencies of natural phenomena between the 'cosmological' and 'quantum' domains. The goal of this series of conjectures is (a) to develop a unification theory for quantum gravity effects through to cosmology, by extrapolating between the existential states and analogous patterns in the three domains that have been described in Section 3; and (b) to predict the existence of new domains that are conjectured to contain analogous states and patterns of consciousness, on both sides of these three states (see Appendix 1: "*Theory of Analogy*").

4.1. The 'Existential Relativity Constant'

The magnitude of this new **'Existential Relativity Constant'**, $\lambda = 10^{23}$, which is arguably the most significant discovery in this conjecture, can be derived by an inspection of the geometric progression of successive reference planes in Figure 1, as well as analogous patterns or 'states of existence'. The dark, vertical lines with arrowheads indicate a separation by $\mathbf{[1]}_\lambda$ unit of measure along the linearized $\mathbf{[y]}_\lambda$ axis, which maps into the 'ER Constant', $\lambda = 10^{23}$ as the ratio of the size, measured linearly in terms of 'δ', of successive planes of reference, beginning with:

a) The 'Plane of Grand Unified Theories (GUTS)' at the bottom, which measures 10^{-33} m = 10^{-23} units of 'δ' ≡ $\mathbf{[-1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis), then

b) Upwards $[1]_\lambda \equiv 10^{23}$ units of 'δ' on the horizontal $\mathbf{[x]}_\delta$ axis—to the 'Atomic Plane'—measuring 10^{-10} m = 1 unit of 'δ' ≡ $\mathbf{[0]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis), then

c) Upwards another $[1]_\lambda \equiv 10^{23}$ units of 'δ' on the horizontal $\mathbf{[x]}_\delta$ axis—to the 'Solar System Plane'—measuring 10^{13} m = 10^{23} units of 'δ' ≡ $\mathbf{[1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis), and finally

d) Upwards another $[1]_\lambda \equiv 10^{23}$ units of 'δ' on the horizontal $\mathbf{[x]}_\delta$ axis—to the 'Universal Plane'—measuring 10^{36} m = 10^{46} units of 'δ' ≡ $\mathbf{[2]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis).

A pertinent question is: "*In each of these three domains in between the four planes defined above, are natural laws the same; or are there subtle, relative differences in each domain?*" The answer may be obtained indirectly, if we recognize the fact that there are already discernible differences even within our own observable 'Datum Domain'. We refer here to the phenomenon of time dilation that is the essence of Einstein's 'Theory of Relativity', which explains the 'space-time' conundrum[2].

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[1] Observability is not necessary to scientific status, as theoretical physics has abundantly demonstrated. The postulation of many entities and events that cannot be directly observed or studied in practice or in principle is still considered to be a product of scientific inquiry, based on inferences that have been made from observable natural phenomena. For example, various kinds of forces and fields, molecular biological structures, electrons, black holes, historical 'facts' and other instances of 'unobservables' may be inferred from observable phenomena. Nevertheless, it has to be stressed that most of these postulations are unambiguously the result of scientific inquiry.

[2] **Bertrand Russel** in his '***ABC of Relativity***' [1] has said that we have to think of the distance between two events, not between two bodies. If two bodies are moving relatively to each other, the distance between them will be continually changing, so that we can only speak of the distance between them at a

4.2. Looking 'downwards' of the 'space-time' conundrum

This 'space-time' conundrum ceases to be mysterious if we could transport our consciousness into the highest echelons of the 'Datum Domain'. That is, if we pretended to be colossi that lived on the sun, traveling at speeds that are comparable with the speed of light, then Einstein's theory of relativity regarding time and space warps would become immediately apparent. Newtonian physics would be found to be wanting in explaining observed physical phenomena at this level of consciousness.

However, as we diminish our consciousness to the level of human beings that live on the surface of this earth and move at speeds that are non-relativistic, then the 'space-time' relativistic effects are *barely* 'observable'. The case can therefore be made that the variability of this fourth 'time' dimension as we know of it now, just begins to enter our consciousness at the middle of the 'Datum Domain' (see Figure 1). In other words, although Einstein's theories remain just as valid as ever, the physical laws that were conceived by Newton appear to be now wholly defensible in this essentially *observable*[3] three-dimensional world[4], where the 'time dilation'[5] has all but "curled out of view" or "folded up". We can now begin to view distances simply as space between two bodies, and where the time lapse between two events is practically invariant from one observer to another. That is how the three famous laws of Newton were conceived, where time[6] is assumed to be an "*unwarpable*" or "*undilatable*" variable. An apple falling from a tree would assume a predictable trajectory as it falls on a person's head, should it be directly in its determinable path, *a priori*.

If we further diminish our consciousness within the 'Datum Domain', down to the level of living cells with linear dimensions of the order of 10^{-5} m, it would appear that we need no longer be detained by issues of 'time dilation', at all. The experiences of hypothetical sub-atomic midgets that live at the 'Atomic Plane' of consciousness—where the uncertainty principle is

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given time**.** For example, if one is in a train traveling due East from Calcutta towards Dhaka, one can speak of one's distance from Dhaka at a given time. But different observers will judge differently as to what is the same 'time' for an event in the train and an event in Dhaka. This makes the measurement of distances relative, in just the same way that the measurement of time has been found to be relative.

We commonly think that there are two separate kinds of intervals between two events - an interval in space and an interval in time: between one's departure from Calcutta and one's arrival in Dhaka, due East, there are, say, three hundred kilometers and three hours.

Another observer will judge the time differently; it is even more obvious that she will judge the distance differently. An observer on the sun will think the motion of the train quite trivial, and will judge that you have traveled the distance traveled by the earth in its orbit and in its diurnal rotation, perhaps due 'West' if that is the case. On the other hand, a flea in the railway carriage will have judged that you have not moved at all in space, but have afforded her a period of pleasure which she will measure by her 'proper' time, not by the Greenwich Observatory.

It cannot be said that the traveler, the sun-dweller or the flea are mistaken: each is equally justified and is only wrong if she ascribes an objective validity to her measures. The distance in space between two events is therefore not in itself a physical fact. But there is a physical fact, which can be inferred from the distance in time together with the distance in space. **This is what is called the 'interval' in space-time.**

[3] The term refers to physical observability.

[4] The three '*observable*' spatial dimensions seem to be the minimum for life; it would be difficult to design a living thing that could exist in only two dimensions. For example, the food that the creature could not digest would have to be spat out the same way it came in, for if there was a passage right through, as we have, then the two dimensional creature would simply fall apart.

[5] 'Time dilation' refers to the phenomenon where the time lapse between two events is dependent on the relative speeds of the observers' frames of reference (footnote #1), instead of being invariant from one observer to another—as would be expected in 'the normal course of events on earth'. This phenomenon is amply demonstrated in the paradox of the twin sisters, in which one flies off in a spaceship traveling near the speed of light and returns only to discover that her twin has aged much more rapidly.

[6] Time 't', sometimes plays the role of a parameter, while in other cases it represents a quantity which one may wish to measure. For instance, we may regard time't' as an observable when we have to measure flight-times, collision durations, interaction-durations, mean life-times of metastable states, etc.

dominant and gravitational effects are negligible—will be in sharp contrast to the experiences of hypothetical 'colossi' at the 'Solar System Plane'. Just as 'time dilation' had approached the limits of observability to colossi that lived on the sun, the case can now be made that the 'z-axis' dilation will approach the limits of observability to hypothetical, sub-atomic midgets that lived on the nuclei of an atom, which is deemed to be analogous to the 'Sun' in our 'Datum Domain', having linear dimensions of the order of 10^{-15} m. Although consciousness at the diminished level of existence of cells and DNA begins to assume a two-dimensional character on a slide placed under the lens of a microscope, and as Newtonian Physics has inexorably given way to the laws of Quantum Mechanics—the third dimension (the 'z'-axis) is still very prominent, for example, if we try to describe the path of electrons around the nucleus[7] of an atom. We immediately notice the similarity between the nucleus of an atom and the sun, from their physical and structural characteristics, and which therefore leads us to the conclusion that they occupy complementary positions in their respective domains, separated vertically by one unit on the $\mathbf{[y]}_\lambda$ axis[8]. This also implies that the 'ER Constant', $\lambda = 10^{23}$, can be viewed as a multiplier (see Figure 1), or the common ratio in a geometric series.

By comparing with the way that the fourth 'time' dimension begins to 'curl' or 'fold up' in the middle of the 'Datum Domain', we can conceive that the third 'z' dimension of three-dimensional 'x-y-z' space will also begin to 'curl' or 'fold up' as we descend beyond the nucleic level of consciousness and approach the middle of the 'Quantum Domain'. If we could travel further down the ER-Scale and pretend that we were sub-sub-microscopic particles that existed at the level of Super Symmetry (SUSY, see Figure 1) having linear dimensions of the order of 10^{-23} m—by applying the principles of analogic reasoning—such a state of consciousness may be viewed as complementary to the 'human' state of consciousness, as it is also separated vertically by one unit on the $\mathbf{[y]}_\lambda$ axis. We can also say that: just as 'time dilation' has "curled out of view" or "folded up" when our consciousness rests at the middle of the 'Datum Domain', the third 'z-axis' dimensional dilation will begin to "curl out of view" or "fold up" when our consciousness is at the middle of the 'Quantum Domain', and diminishes rapidly as we descend further. The analogy between human beings and SUSY needs to be reiterated, and we will reflect on the implications of this analogy later in this conjecture.

As we have traversed the existential span—from colossi that lived on the sun to sub-sub-microscopic particles that exist at the level of SUSY, we may pause to contemplate the significance of the **'**Existential Relativity Constant', $\lambda = 10^{23}$, which appears to put into perspective

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[7] Niels Bohr introduced the idea of electrons in halo orbits that are non-equatorial to the nucleus (see figure 5). For example, the Hydrogen molecule, H_2, is modeled as two protons with a pair of shared electrons in a common orbit lying midway between the two nuclei, analogous to the orbital pattern of satellites that are in gravitational equilibrium between the Earth and the Sun, for example.

[8] Let us consider how light behaves in different states of existence. In the Cosmological Domain, light is believed to curve at the 'edges' of the universe. However, in the Datum Domain, a beam of light is known to travel in a straight line and is not dissimilar to the behavioral patterns of masses of arrayed people, such as military formations with orders to move in a particular direction, or masses of people in a rapid transit system, whose movement if viewed from a great distance, would not be dissimilar to the beam of light. If we could observe a beam of light striking a sheet of glass, we can measure the fractions which are absorbed, transmitted and reflected back - depending on the physical properties of the glass, the angle of incidence, and so on. In each instance, there is a statistical law that governs the exhibited behavior of the whole. However, if one was to focus on individual soldiers or travelers, then we could detect discernible differences in their behavior, although when viewed afar, it just seems to be a mass of humanity in common cause, just at is with a beam of light that behaves predictably. If we could shrink our consciousness down into the Quantum Domain (perhaps down to the level of Super Symmetry at about 10^{-23} meter) and view the behavior of a single photon—a quantum of light—as it approaches a hypothetical glass interface, we ask: *Does it reflect back, or does it wave right through?* It seems to assume a microcosm of its own. At the level of SUSY, a beam of light is not unlike a marching band of soldiers or a seething mass of commuters. At the level of SUSY, light phenomena is statistical no more; every photon of light exhibits a mind of its own … as does 'humankind' in her own 'Datum Domain' … in the platform of the 'here and now'! This complementarity between the laws of optics that govern a beam of light striking a glass surface and the behavior of a column of soldiers as they run into a brick wall is the essence of TER.

the states of existence of even unobservable states. This view will be strengthened in Section 6, when comparisons with the 'Periodic Table' will be made.

Hence, as we traverse further down the ER-scale in Figure 1, we may extend this analogic process (see Appendix 1: "*Theory of Analogy*") and leap to the conclusion that the lowermost 'Plane of Grand Unified Theories' in Figure 1—measuring 10^{-33} m = 10^{-23} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[-1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis—represents a consciousness that is at once analogous to the 'solar system' and the atomic structure. The analogic process would also suggest:

(a) The existence of a focal entity having a linear dimension of 10^{-37} m, about 10^{-4} units on the horizontal $\mathbf{[x]_\delta}$ axis below the 'GUTs Plane'. This pattern would also be analogous to the structure of the 'Sun' and the 'Nucleus' in the 'Datum' and 'Atomic' planes of reference, respectively, above it. Let us call this domain the **'X - Domain'**. If we could imagine that we were unimaginably tiny creatures that lived on this focal entity at the top of the 'X - Domain', then—in another leap of analogy—we could conceive that the 'y-axis' dilation' (the second of thee-dimensional 'x-y-z' space) is approaching the limits of full observability at this level of consciousness;

(b) The existence of a platform at the middle of the 'X - Domain', where sub-sub-microscopic creatures could exist (analogous to the little girl in the 'Datum Domain'); we could similarly analogize that the second 'y-axis' dilation will have essentially "curled out of view" or "folded up" at this level of consciousness, and further beyond.

It would appear that nothing prevents us from continuing with our descent down the ER-Scale, until we can diminish our consciousness down to the next referential plane—measuring 10^{-56} m = 10^{-46} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[-2]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis—which represents a consciousness that is arguably again structurally analogous to the 'solar system' or the 'atomic' structure. Let us refer to it as the '**X - Plane**'. By further analogizing with previous referential planes shown in Figure 1, we can infer:

(c) The existence of a focal entity having a linear dimension of 10^{-60} m, about 10^{-4} units below the 'X - Plane'. This entity would also be analogous to the structure of the 'Sun' and the 'Nucleus' in the 'Datum' and 'Atomic' planes or reference, respectively. Let us call this domain the '**Zeroth Domain**'—and we could conceive that the 'x-axis' dilation' (the first of three-dimensional 'x-y-z' space) is approaching the limits of full observability at this level of consciousness;

(d) The existence of a platform at the middle of the 'Zeroth Domain', where we could similarly analogize that the first 'x-axis' dilation will have essentially "curled out of view" or "folded up" at this level of consciousness, and beyond.

It would appear that we would have come close to nothingness, should we apply the theory of analogy once more, which would permit us to travel further down to reach the 'ultimate' benchmark plane of consciousness, measuring 10^{-79} m = 10^{-69} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[-3]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis. Let us call this plane the '**Zeroth Plane**', where there are no more dimensions left to be observed.

The 'Zeroth Plane' has a special place in our conjecture. We shall apply the theory of analogy one more time to determine the position of the origin of the 'Zeroth' dimension. It would appear that if we could pretend that we were smaller by 10^{-13} units of δ than this 'Zeroth Plane', then we would have essentially arrived at the origin of 'nothingness', as it were. This point would measure 10^{-92} m = 10^{-82} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[-3.565]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis—it represents a boundary existential limit that we shall call the '*Lower Limit of Existence*' in our Theory of Existential Relativity.

4.3. Looking 'upwards' of the 'space-time' conundrum

As we look back at the developments made in the previous section, we can intuitively 'see' what is happening in the skies above us, as we look upwards of the space-time conundrum.

However, in this section we will not attempt to find analogic states of existence by traveling down from the focal points of reference planes. Instead, we will attempt to do so by progressively going upwards of the linearized ER-scale (see Figure 1), starting at the bottom of the 'Cosmological Domain', which lies between the 'Solar System' and 'Universal' planes of reference.

The following comparisons can be made between the 'Cosmological Domain' and our own observable 'Datum Domain', as we ascend upwards from the 'Solar System Plane':

- It would appear that 'Galaxies', which are about 10^5 times larger in diameter than our solar system, would signify a consciousness that is structurally analogous with 'Deoxyribonucleic Acid' (DNA) and cellular structures in the 'Datum Domain';
- A 'Galactic Cluster', which is about 10^5 times larger in diameter than a galaxy, would be located in the middle of the 'Cosmological Domain', and is conjectured to be analogous to the little girl at the middle of the 'Datum Domain'; we may further conjecture that it signifies a 'lively' state of consciousness, just as we had previously conjectured in the case of SUSY in the 'Quantum Domain';
- 'Galactic Super Clusters', which are about 10^7 times larger in diameter than 'Galactic Clusters', would be analogous with planetary forms, such as Earth, in the 'Datum Domain';
- And finally, 'Super Super Clusters', which are about a hundred times larger in diameter than 'Galactic Super Clusters', would be analogous to the 'Sun' pattern in our 'Datum Domain', and manifest itself as the focal point in the 'Universal Plane', in much the same way that the 'Sun' is at the center of our 'Solar System'.

Using the same leap of analogy with which we traced the various dimensions from the first (x-axis) to the fourth (time) in the previous section, we may say that—just as the 'space-time' dilation had just become fully observable to colossi that lived on the Sun at the top of the 'Datum Domain', and as the 'time dilation' has "curled out of view" or "folded up" in the middle of it—the case can now be made that:

(a) A 'fifth dimension' dilation will begin to 'uncurl' or 'fold out' as we ascend to the middle of the 'Cosmological Domain', if we could pretend that we were giants that live at the level of 'Galactic Clusters' measuring 10^{23} m = 10^{33} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[1.435]_\lambda}$ on the vertical $\mathbf{[y]_\lambda}$ axis (see Figure 1). The analogy between human beings and 'Galactic Clusters' has already been reflected on. Let us weakly conjecture that this fifth dimension is the "Frequency Dimension", as it appears to be the next logical candidate for a dimension in hierarchical progression to 'time'.

(b) The 'fifth dimension' dilation, by analogy, will have 'uncurled' or 'folded out' and become fully observable to super colossi that live on 'Super Super Clusters' that measure 10^{32} m = 10^{42} units on the horizontal $\mathbf{[x]_\delta}$ axis.

As we ascend further up the ER-scale (see Figure 1), we may extend the analogic process described in Section 4.1, and arrive at the conclusion that the uppermost pattern of consciousness in the 'Cosmological Domain' is the 'Universal Plane', measuring 10^{36} m = 10^{46} units on the horizontal $\mathbf{[x]_\delta}$ axis ≡ $\mathbf{[2]_\lambda}$ on the vertical $\mathbf{[y]_\lambda}$ axis. By applying the principle of analogy, we conclude that the 'Universal Plane' will have a structure that is also 'heliocentric', similar to the 'solar system' and the 'atomic structure'.

Without being repetitious, we can further develop this line of reasoning—centered on the analogic process that has been described in Appendix 1—to construct two more domains above the 'Cosmological Domain', so that we have a total of seven domains, where each domain is sandwiched between two referential planes that are separated by a geometric progression determined by the 'Existential Relativity Constant', $\lambda = 10^{23}$, which is also the ratio of linear dimensional measurements between any two successive planes of reference.

The reasons for stopping at seven domains are briefly as follows:

- At the end of Section 4.1, we had conjectured that there will be a lower boundary existential limit called the 'Lower Limit of Existence', which was located at $\mathbf{[-3.565]_\lambda}$ on the

vertical $[y]_\lambda$ axis. We can apply the theory of analogy to conjecture that the 'Upper Limit of Existence' would measure 10^{92} m = 10^{102} units on the horizontal $[x]_\delta$ axis ≡ $[+4.435]_\lambda$ on the vertical $[y]_\lambda$ axis. An aggregation of these two boundary limits will reveal that the difference between them are $[8]_\lambda$ units on the vertical $[y]_\lambda$ axis. This can be interpreted to be an octave[9], which represents a natural ordering of nature. The impact of this observation will be amplified in Sections 5 and 6, where we shall make further conjectures on the rationale and on the dilation of dimensions;

- Just as an octave represents a natural ordering of nature, so does the number seven, as we shall see in (a) Section 5 which draws on the analogy of the seven primary colors of nature, which will be used for modeling purposes (see footnote # 10); and (b) Section 6, in which comparisons with Mendeleyev's Periodic Table will be made, which also has seven rows, and has provided many insights into our present formulation of the 'Theory of Existential Relativity', as well.

4.4. Continuum

In the case of the first four dimensions—the three spatial and time dimensions—we have a firm basis in observed natural phenomena to conjecture on the progression of dimensions. The choice of 'frequency' as the fifth dimension is purely conjectural, and is based on the observation that angular rotation of the 'time' axis is possibly the next higher abstraction of a model to describe the behavior of an object that has passed through the first four observable dimensional dilations.

What can possibly come after this unsubstantiated conjecture that frequency is the 'fifth dimension', is beyond the scope of this paper—other than to say that these progressions may well be related to frequency, just as the first three dimensions were related to spatial parameters in building up to a three-dimensional object. Perhaps imaginary numbers are involved, or some exotic geometrical constructions—but it would be purely speculative at this stage to proceed any further in this aspect of the development of our 'Theory of Existential Relativity' in the absence of observed natural phenomena to base our analogic reasoning process.

We will therefore end this section on 'Reflections on the Theory of ER' (TER) with the suggestion that perhaps the concept of 'frequency' is the most likely candidate as a reference frame for developing models of consciousness that are higher than the four dimensions that are observable in nature. Without further speculation, let us therefore refer to the sixth and seventh domains of consciousness as "**ω-Domain**" and "**Ω-Domain**", and the concomitant referential planes at the top of these two domains as "**ω-Plane**" and '**Ω-Plane**". The rationale for limiting our conjecture to these seven domains (between an 'octave' of referential planes) has already been presented in summary form at the end of Section 4.3.

5. Domains and Planes of Consciousness

On the basis of the previous developments, it is possible to conceive of seven domains of consciousness, between eight planes, as shown in figure 2. It is not a dimensionally correct figure, in the sense that it models neither the physical characteristic of the dimension (the rectangular form has been arbitrarily adopted for convenience of drawing) nor the spatial relationship of the specific patterns of existence, nor.

[9] The **octave** represents yet another natural ordering of nature—sound or vibrations—and it is known that there are eight such classifications defined by Do, Re, Mi, Fa, So, La, Ti, and back to Do; this is analogous with the eight 'Planes of Consciousness' in TER; in other words, it is our further conjecture that existential patterns recur in octaves, in a way that is consistent with the conjecture discussed in 'footnote # 14'.

Figure 2 is therefore only intended to provide a three dimensional view of the progression of these seven domains between the eight referential planes, in our quest to understand the ramifications of the TER.

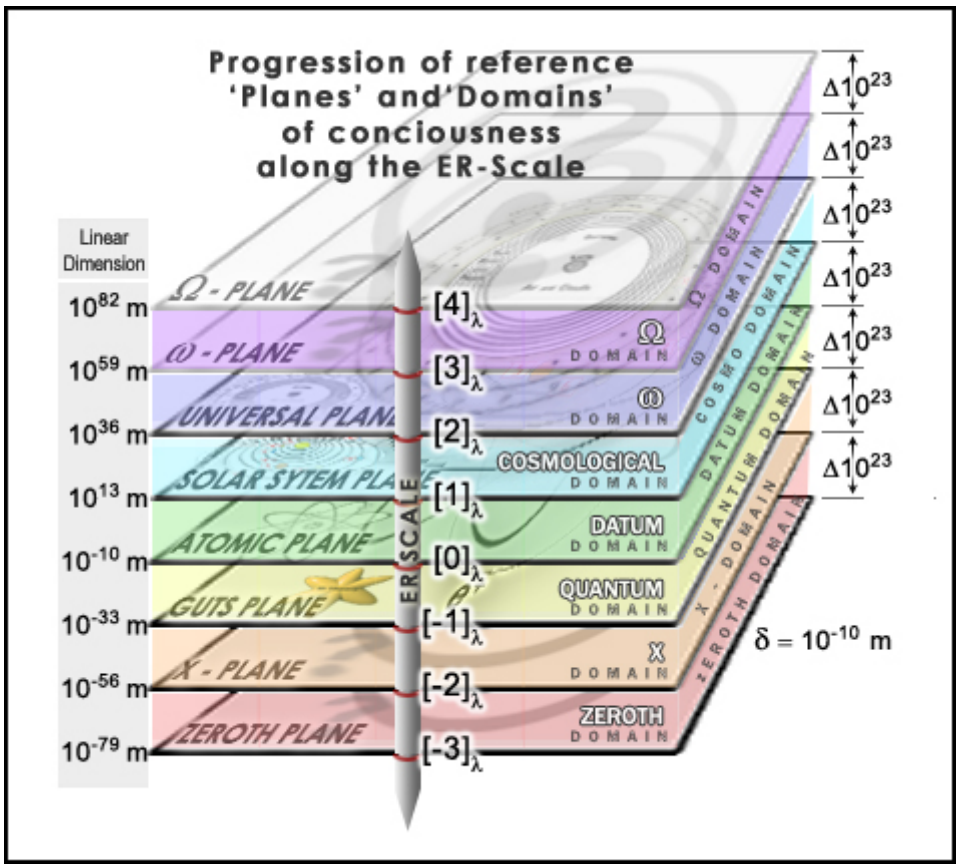

Figure 2. Progression of reference 'Planes' and 'Domains' along the ER-Scale. In each domain, we may determine the linear measurement of the focal entity at the top of each domain by multiplying the linear measurement of the focal entity at the bottom of it by the ER Constant, $\lambda = 10^{23}$, which may therefore be viewed as a multiplier that determines the linear dimension of the representative element in the next higher plane of consciousness, or between complementary analogous states of existence, as between the girl child in the 'Datum Domain' and 'SUSY' or 'Super Cluster' in adjacent domains.

5.1. Progressions along the ER-Scale

We have used the seven primary colors of the rainbow[10] to delineate the domains. The 'Datum Domain' which lies in the middle has a green color, flanked above by the 'Cosmological Domain' in blue, and below by the 'Quantum Domain' in yellow. As noted earlier, figure 2 shows that there is a separation of $\mathbf{[8]}_\lambda$ units on the vertical $\mathbf{[y]}_\lambda$ axis between the lowermost and uppermost planes. In other words, these seven domains lie between eight uniformly distributed referential planes, which can be interpreted to be an octave. The 'octave' represents a common occurrence in natural phenomena (see footnote # 9).

[10] The seven 'rainbow' colors represented by the mnemonic 'VIBGYOR' (as shown in Figure 2) represent a natural ordering of color, which we shall use to delineate (a) the seven bands of Mendeleyev's 'Periodic Table', as well as (b) the seven analogous domains in the 'Theory of ER' (see figures 2 through 4, for a visual representation of this analogy).

5.2. Dilation of dimensions

The term 'dilation', as has been explained in 'footnote # 5', refers to the phenomenon where the magnitude of a dimension is dependent on specific characteristics of the observers' frames of reference, instead of being invariant from one observer to another. For example, in the case of time dilation, this 'specific characteristic' is related to the relative speeds of the observers' frames of reference.

We shall use the construction in Figure 2 to further conceptualize the dilation of different dimensions that have been described in Section 4.1, and is graphically shown below in figure 3.

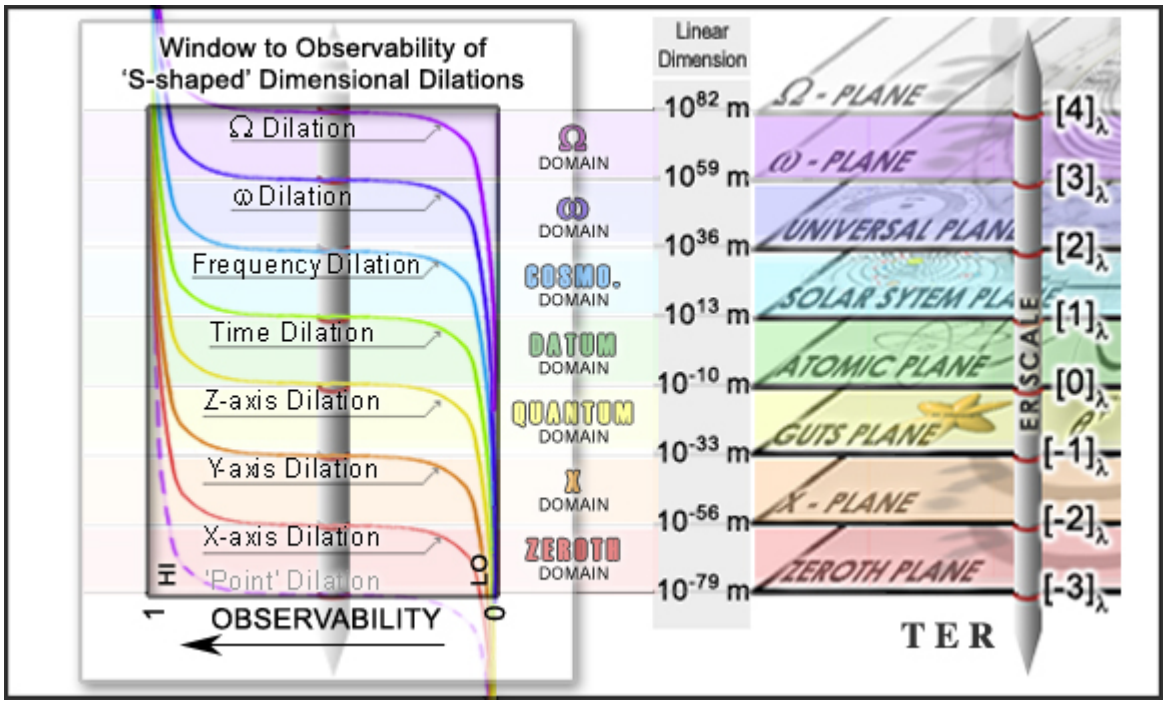

Figure 3. Observability of dimensional dilations follows an 'S'-shaped trajectory in successive referential planes. It describes the observability of each dimensional dilation as it rapidly changes state from 'low' (or '0') to 'high' (or '1') within 1 ER Constant; starting with the equivalent of a 'dot' for the 'Zeroth' or 'Point' dimension in the 'Zeroth Plane'.

It is our conjecture that each dimension 'uncurls' or 'folds out' in each domain, starting with:

- The 'Point' dilation in the 'Zeroth-Plane' at the bottom of the lowermost 'Zeroth Domain', indicated by the dotted line in violet color—to yield 'Zeroth' dimensional space (the equivalent of a 'dot'[11]);
- The 'x-axis' dilation along the 'X-Plane' at the top of the lowermost 'Zeroth Domain'—to yield one dimensional space (the equivalent of a 'line', which is obtained when a zero-dimensional point is extruded in the direction of the 'x-axis');
- The 'y-axis' dilation along the 'GUTS Plane' at the top of the in the 'X - Domain' for two-dimensional space (the equivalent of a 'plane', which is obtained when a one-dimensional line is extruded in the direction of the 'y-axis' that is perpendicular to the 'x-axis');
- The 'z-axis' dilation along the 'Atomic Plane' at the top of the 'Quantum Domain' for three-dimensional space (the equivalent of a 'cube', which is obtained when a plane is extruded in the direction of the 'z-axis' that is orthogonal to both, the 'x-axis' and the 'y-axis'); and

[11] A point or 'dot' is zero dimensional because it has no width, length, or height, and is infinitely small

- The 'time dimension' dilation along the 'Solar System Plane' at the top of the 'Datum Domain' for four-dimensional 'space-time'.

The 'fifth dimension' that uncurls at the top in the 'Cosmological Domain' has been weakly conjectured to be 'frequency'[12], as the next higher level modeling abstraction after 'time'.

In the absence of scientific evidence to suggest otherwise, we will not speculate on the sixth and seventh dimensions. The formulation of a plan to study and to develop suitable conjectures to explain the nature and characteristics of dimensions higher than the fourth, 'time', will be left for a later exercise.

6. Rationale for Conjecture

We began this conjecture by stating that we intend to prove the 'Theory of Existential Relativity' (TER) by analogizing with the periodicity of observable cosmological and quantum phenomena, in order to predict the existence of discrete existential patterns in domains that are beyond observation.

6.1. Comparison with Mendeleyev's 'Periodic Table'

Our conjecture rests on the belief that Mother Nature has a set of reusable cardinal rules that result in the wonderful symmetry of observable natural phenomena. The 'ER Constant', $\lambda = 10^{23}$—which is the central idea of this conjecture—is a structural detail that we believe fits with the grand design of Mother Nature that extends far beyond the observable in both directions—small and large.

We have already mentioned 'color' and 'octaves' as natural phenomena that also have strong analogies with the progression of seven 'dimensions' and eight referential 'planes'. In this section, we compare the structural similarities between **TER** and **Mendeleyev's 'Periodic Table' (PT)** that is shown in Appendix 2, which ushered in a revolutionary way of conceiving the real world. The systematic distribution of elements between the seven periodic 'levels' shown in the upper part of Appendix 2—based on the presence of 'empty' or 'filled' states of the outermost electronic orbits in these elements—is an elegant way of conceiving how Mother Nature organizes her objects of creation.

This analogy[13] is at the heart of our conjecture in the 'Theory of ER', which is demonstrated in figure 4 by aligning the seven color-coded stratifications in the 'inverted' Periodic Table at the bottom of Appendix 2 with a matching color-coded set of seven domains in TER, which have been developed in figures 2 and 3, and which have been transposed to the right in figure 4, for visualizing this analogical frame of reference.

In figure 1, it was seen that the icons of observable existential patterns traverse a sloping 'blue' line rising from left to right, in accordance with equation 1. In figure 4, these observable icons are superimposed over the PT, in a progression from left to right, and in accordance with the corresponding domain in TER shown on the right.

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[12] The choice of 'frequency' as the next higher dimension after 'time' is from a logical frame of analysis. Coupled with angular rotation and imaginary quantities, it provides a credible base for modeling abstractions and conjectures that are beyond the scope of this present paper.

[13] In a philosophical sense, and in the context of the discussions that follow Figure 4—of patterns of consciousness that are analogous to 'forms of life'—it may be interesting to relate the analogy of the male/female aspect of living organisms on this earth, with the idea that supersymmetric quantum mechanics also involves pairs of Hamiltonians; the symbol of SUSY adopted in Figure 1 shows '+' and '-' signs affixed to it.

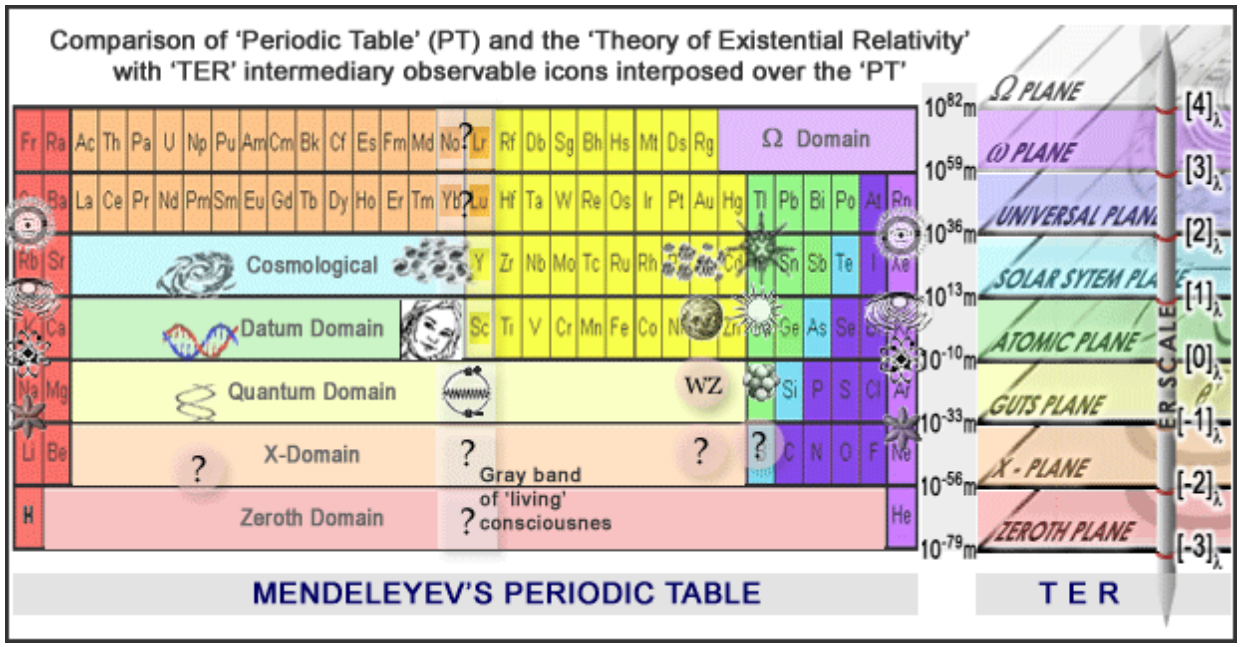

Figure 4. A comparison of the 'Periodic Table' with the 'Theory of Existential Relativity' with 'TER' intermediary observable icons interposed over the PT in each corresponding 'observable' domain in the 'TER', considering the 'red' and 'violet' elements to be at the lower and upper referential planes, respectively.

For example, the icon of the little girl is at the middle of the fourth, green band, which aligns with the 'Datum Domain'. The 'Galactic Cluster' and 'SUSY' (see footnote#13), which have been conjectured to be analogous 'life-forms' in the 'Quantum' and 'Cosmological' Domains, respectively, are aligned vertically above and below this icon of the girl, respectively. The question marks that appear below SUSY indicate patterns of consciousness that are also analogous to a 'form of life', but we do not know enough to conjecture about its nature or even to give it a name. Similarly, it can be conjectured that there exists 'question marks' on the gray shaded band—which represents a transcendental band of 'living' consciousness—that extends upward into the "ω-Domain" and the "Ω-Domain", centered around the elements No, Lr, Yb and Lu.

The nature of these 'question marks' is speculative. And it is not merely a coincidence that the icon of the little girl—a 'living' entity—appears near the middle of the inverted Periodic Table on the left of Figure 4. However, further conjectures in this direction are beyond the scope of this paper, and we shall leave these speculative inquiries for a later exercise.

Another significant feature in figure 4 is the repetition of the cardinal 'heliocentric' structure along both the left and the right 'violet' and 'red' elemental bands of the PT. It would appear, for example, that the atom can be viewed as being either at the end of the 'Quantum Domain', or at the beginning of the 'Datum Domain'. This leads to the further conjecture that the ends of the inverted PT shown in figure 4 could be folded into a 'cylindrical' form. It therefore requires only the least bit of imagination to conjure the 'helical screw' and subsequent 'vortex' structures that are discussed in Section 6.2, to describe alternate models for the distribution and the progression of various patterns of consciousness that form the basis of the 'Theory of Existential Relativity'.

Meanwhile, let us explore the analogies between PT and TER, first.

6.2. Analogy between PT and TER

We have observed and acknowledged the uniquely predictive characteristic of Mendeleyev's 'Periodic Table' (PT) in providing a scientific basis for understanding nature. The present conjecture on TER borrows on this concept of periodicity in order to predict undiscovered existen-

tial patterns, in the same way that the PT has successfully predicted undiscovered elements. As a result, we are able to map complementary existential patterns of consciousness, in much the same way that Mendeleyev was able to predict the existence of elements, on the basis of quantum numbers and rules for filling up off energy levels of orbiting electrons. A closer study of the PT and TER in Figure 4 yields the following observations:

6.2.1 The first 'lowermost' band

In the PT, the lowermost band comprises of the elements 'H' and 'He' only, with nothing in between. This is analogous to the 'Zeroth Domain' in the TER and is in agreement with observed processes of natural selections, in which the foundations of complex patterns[14] are composed of an ordered aggregate of elementary building blocks.

6.2.2 The next two higher bands (second and third)

The second and third rows of the PT comprises of the elements (i) Li, Be, B, C, N, O, F and Ne and (ii) Na, Mg, Al, Si, P, S, Cl and Ar, respectively. Both bands are relatively sparse and cover barely 25% of the charted area in the 'Periodic Table'. They complement the 'X-' and 'Quantum-' domains and reinforce the 'building block' concept for erecting a 'grand superstructure', in that lower 'entities' are relatively less complex than higher 'elements' and 'states of consciousness'.

The parallel 'life-forms' that were conjectured to exist at the level of 'SUSY' in the 'Quantum Domain', and below it in the 'X-Domain', are progressively less evolved than the human form, in every sense of the expression.

There are question marks shown in Figure 4 on the missing entities in the second band (which corresponds to the 'X-Domain'), that relates to corresponding observable forms in the third band (which corresponds to the 'Quantum Domain'), notably the 'nucleus' and 'SUSY';

6.2.3 The next two higher bands (fourth and fifth)

The fourth and fifth rows in the Periodic Table—comprising of a larger number of elements ranging between (i) K and Kr in the fourth and (ii) Rb and Xe in the fifth—are more densely populated than the preceding two rows and cover half of the space. The mid-way element denoted by 'Sc' coincides with the superimposed image of the 'Little Girl'—human intelligence—which signifies a 'mature' state of consciousness.

This observation also reinforces the conjecture that:

a. 'Intelligent' life-forms begin to manifest themselves at the middle of the 'Datum Domain'; indeed, *an inference that can be made is that: 'life-forms' exist in the middle zone of each domain of consciousness, as indicated by the grayish vertical band in the middle*;

b. By corollary, the 'heliocentric' structure of the patterns at the 'end-points' of each domain—the atom and the solar system—appear to signify an 'inert' state that is furthest removed from any 'life-form', as it were:

   - The atom, for instance, is characterized as the smallest indivisible particle of an element, which combine to form molecules, cells and so on in a progression of aggregation that culminates in the human form as the highest state of intelligence in the middle of the 'Datum Domain';
   - A further increase in the linear dimension tends to progressively diminish this characteristic of intelligence or 'life-form', as it were, until we arrive at the pattern of existence defined by the sun and finally, the solar system plane, which is analogous

[14] It is believed that a large proportion of the universe is filled with Hydrogen, which is the simplest element known to man. The analogy with octaves and figure 3 would suggest that the 'Zeroth Domain' is in a cusp between our state of consciousness and another that is below it.

to the atom and may be characterized as the "smallest indivisible particle" for complementary existential states in the 'Universal Domain'.

c. The corresponding 'life form' that emerges at the middle of the 'Universal Domain'—which corresponds to the icon of the 'Galactic Cluster'—will experience the dilation of the 'fifth' dimension;

d. The identical number of elements in the third and fourth rows of the PT suggest that there is some form of complementarity, although we can safely conjecture that the life form in the higher 'Universal Domain' will be more sophisticated than the human state of existence—a form of 'Superman' as it were—just as the 'life' form in the latter is more complex and sophisticated than its equivalent 'SUSY' in the 'Quantum Domain'.

6.2.4 The next higher band (sixth)

The next higher band (the sixth row) in the Periodic Table comprises of a full set of elements ranging between Cs and Rn—half of it populated with rare earth elements—and corresponds to the ω-Domain in TER. It is arguably more complex than any that preceded it. We can safely conjecture that the 'intelligent' life forms that would be predicted to exist at the middle of sixth domain would be a great deal more complex than either the human form in the 'Datum Domain' or the 'Superman' form that was conjectured to exist at the middle of the 'Universal Domain'. No further conjectures that are based on verifiable observations can be made at this time.

6.2.5 The last 'uppermost' band (seventh)

The comments made for the sixth band apply equally well for the highest (seventh) band in the Periodic Table, which is also populated with rare earth elements.

6.3. Alternative geometric models of TER

A model is useful not only to study, but also to explain complex ideas. The complexity of TER is due to the limitations in our ability to observe nature beyond certain limits. Realizable models—whether physical or electronically generated—provide us with a mechanism to go forward with conjectures that are difficult to visualize, such as in the case of TER.

We have conjectured in Section 6 that the ends of the inverted PT shown in Figure 4 may be folded into a cylindrical form. This leads us to the development of the following graphic models that will make it easier to visualize the 'Theory of Existential Relativity'.

6.3.1 Helical 'screw' model

As already noted, it requires the least bit of imagination on the basis of the developments in the previous section, to conjure the 'helical screw' form that is shown in figure 5, as a likely geometrical description and model of TER.

The figure is not drawn to scale, and is purely indicative of the arrangement of different patterns of consciousness that are arranged at marker positions along the edge of the helical screw. The 'pitch' of the helical screw is defined by the 'ER Constant' that measures 10^{23} units of 'δ' ≡ $\mathbf{[1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis. It is also the geometric progression of (a) the 'heliocentric' existential states of consciousness that has been described in Section 2 as having a 'solar system'/'atomic' structure, with 'planets'/'electron'-like objects circling a central 'sun'/'nucleus'-like anchor and (b) the intermediary patterns and states of, which are analogous to one another (as between DNA' and 'Galaxy', for instance) and which assist us in visualizing the novel conception of cosmology according to TER. The icons of the various patterns of consciousness shown in Figure 1 are suitably placed along the rim of the 'thread', on the basis of their position on the diagonal line in figure 1 and its position on the vertical $\mathbf{[y]}_\lambda$ axis.

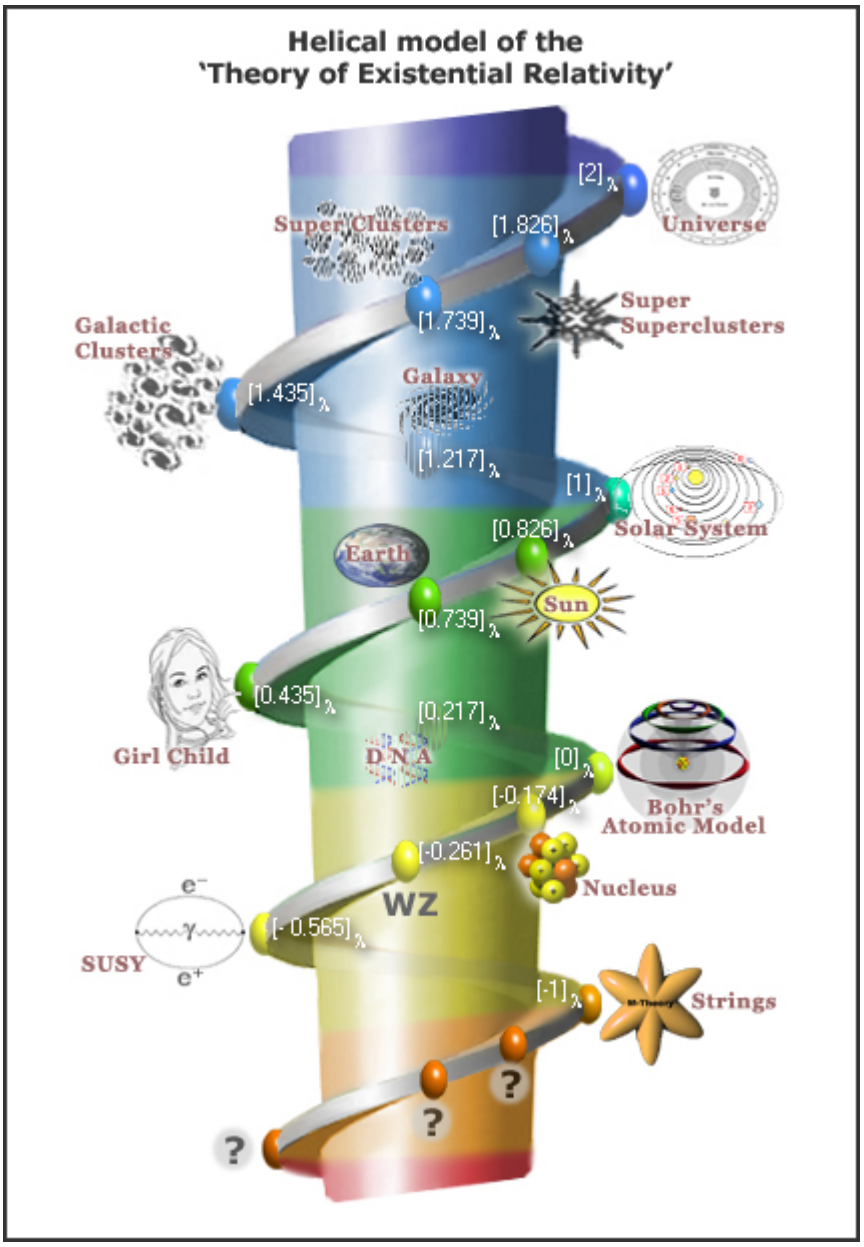

Figure 5. A geometrical description and model of TER which is not drawn to scale, but indicative of the arrangement of different patterns of consciousness that are located at marker positions (indicated with the elongated 'spheroid') along the edge of the helical screw. The pitch of the helical screw 'measures 10^{23} units of 'δ' ≡ $\mathbf{[1]}_\lambda$ on the vertical $\mathbf{[y]}_\lambda$ axis. The 'heliocentric' existential states of consciousness that are characterized by the 'solar system'/'atomic' structure are shown on the right edge and the intermediary patterns and states shown in Figure 1 are suitably placed along the rim of the 'thread', on the basis of their position on the diagonal line in figure 1 and its position on the vertical $\mathbf{[y]}_\lambda$ axis.

The color code is reused from the previous section, for clarity. There is also inflation in the girth of the screw, as we proceed upwards, and it also requires the least bit of imagination to conjecture that this inflation will follow the logarithmic nature of Equation 1, and leads naturally to the development of the 'Vortex' model in the next subsection.

6.3.2 'Vortex' model

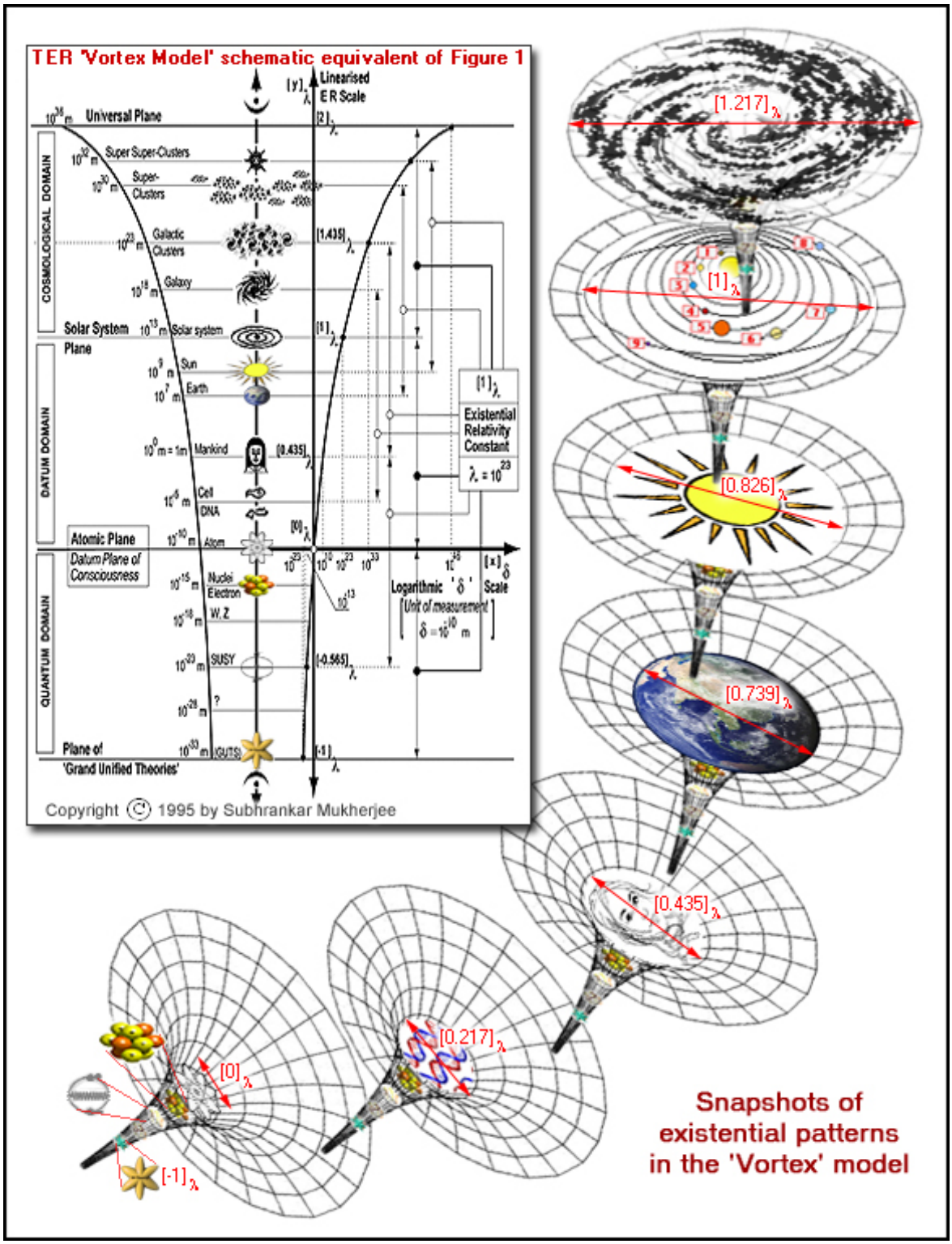

Figure 6. The 'vortex' model shown above provides a 3D visualization of the growth of existential states, and models an extension of the helical 'screw' model shown in figure 5. The shape of the walls of the vortex (shown in the inset cross sectional view) are defined by an exponential equation, that is derived from the simple logarithmic in Equation 1.

While the 'helical screw' model adequately demonstrates the continuously cyclical nature of TER, the 'vortex' model additionally demonstrates its inflation characteristic.

The inset image shown in figure 6 is principally equivalent to figure 1, except that, whereas figure 1 is mathematically correct, the inset diagram in figure 6 is only indicative of the vortex cross section. Needless to say, the shape of the walls of the vortex (shown in the inset cross sectional view) will be defined by an exponential equation, that is derived from the simple logarithmic nature of Equation 1, namely: $[y]_\lambda = \log_\lambda [x]_\delta$. This yields the exponential formula for the inflation along the $[x]_\delta$ axis, as follows:

$$[x]_\delta = \lambda^{[y]_\delta} \qquad (3)$$

6.4. Other conjectures

Let us consider the conjecture that: every atom in our Quantum Domain is a Universe all of its own to the equivalent of the smallest indivisible 'atomic' particle in the 'Zeroth Domain'—two ER constants further down! Conversely, can we conceive our own Universe (at the top of the 'Cosmological Domain') to be 'atomic' to the 'Ω Domain'—again, two ER constants higher up! These visualizations may perhaps explain some of the 'contradictory' phenomena that astrophysicists are reporting today.

For instance, the TER approach accounts for all that dark matter and the mystifying gravitational ramifications of the inflation theory put forward by astrophysicists, when the phenomenon is viewed analogously through the eyes of quantum physicists. It also explains why the universe looks pretty much the same way in all directions. And phenomena such as a supernova as being analogous to the nuclear energy released by splitting an atom, or some such analogously cataclysmic reaction. It accounts for time and space warps, considering that the upper domains would have additional dimensions—beginning with 'time' in the 'Universal Domain'—and which could introduce imaginary numbers into the spatial equations. Hence the concept that higher dimensions are related to 'frequency'. It is claimed that TER provides a flexible foundation for debating the nature and existence of higher dimensions.

TER is also in harmony with the traditional 'Big Bang Theory', particularly the inflation theory, which proposes that the core of the universe (depicted as a 'Super Super-Cluster' in figure 1) expanded outwards phenomenally before the cosmos was one second old. If the 'center' of our universe has the greatest concentration of mass, with Super-Clusters springing from it, in much the same way that the planets in our solar system are believed to have formed from matter spewed out from the sun many billions of years ago, then our analogy between it, the sun and the atomic nucleus is on firm ground.

TER places the human evolution at the unique central point of the models that have been developed, including those that have been shown between figures 1 and 6. It emphasizes our power and our responsibilities and puts our own 'divinity' into perspective as soon as we look into ourselves, firm in the knowledge that our every action holds the destinies of billions and trillions of 'universes' in the palm of one hand! We can practically 'see' this happening in the Quantum Domain.

And it also reinforces mankind's insignificance when we look up towards the heavens in the conjecture that our might is merely atomic to higher dimensional 'life-forms' that apparently have characteristics that we cannot even begin to comprehend, just as we—in the here and now—can hardly comprehend how the time dimension would make us look, if we could view our own existence in the four 'space-time' coordinates.

Thus, adoption of the '*Theory of Existential Relativity*' resolves the contradictions between astronomical theories and observations, because—once we are able to view the universe as an atom and vice versa—various 'impossible', 'absurd' and 'conflicting' observations can be ra-

tionalized. It also comprehensively answers the question: "*Are there relative existential domains - either smaller than the Quantum Domain, or larger than the Universal Domain?*" [15]

And it would appear that the 'heliocentric' existential states of consciousness that has been described in Section 2 as having a 'solar system'/'atomic' structure, with 'planets'/'electron'-like objects circling a central 'sun'/'nucleus'-like anchor, perhaps provide the upper and lower bounds within which we can observe and exist, and it opens up a whole "Pandora's" box of conjectures that border on metaphysical and epistemological ideas and concepts.

It should be noted that the alternative models shown in figure 5 and 6 show a three dimensional construction of ER, because we live in a three dimensional world, where the fourth 'time' dimension has just begun to 'uncurl' or 'unfold', in terms of the discussions in Section 5.1. However, the case can be made that, if we were sub-sub-microscopic midgets that existed at the level of SUSY, this three dimensional vortex would reduce to a two-dimensional sketch, not unlike the one shown in the inset of figure 6, except that the curvature would be supremely sharper. And if we were giants that lived at the level of 'Galactic Clusters', then the image would have been four dimensional, which is beyond our capability to represent with pen and paper (or static pixels on screen, as it were), since an animated, multimedia presentation, though not infeasible, is beyond the scope of this paper. These gigantic states of consciousness would have some form of time contractions and dilations that are purely conjectural in our essentially three-dimensional world, and is also beyond the scope of this paper, as they would be too numerous to inventory. This characterization should be valid across all seven dimensions that are described in Section 5.1.

7. Conclusions

The Theory of Existential Relativity (TER) is based on the periodicity of observable cosmological and quantum phenomena. The existence of existential patterns in domains that are not observable may be predicted on the basis of analogies drawn between Mother Nature and observable natural phenomena.

Some of the conclusions that can be drawn from the TER are:

- The nature and analogous state of each *'consciousness'* or *'pattern'*—depicted symbolically along the sloping blue line in Figure 1 and in the three dimensional models in figure 5 and 6—is periodic and its position may be defined on the ER-scale by the simple logarithmic equation (1), which has as its base the 'Existential Relativity Constant', $\lambda = 10^{23}$;
- The magnitude of this 'ER Constant', which is arguably the most significant discovery in this conjecture, can be derived by an inspection of the geometric progression of successive reference planes in Figure 1, as well as observable and analogous patterns or 'states of existence'; the 'ER Constant may also be viewed as a common ratio of the geometric progression of successive existential states.
- It has been conjectured that there are seven domains, between eight existential planes of consciousness, on the basis of analogies that have been drawn from observable scientific and natural phenomena to justify the validity of TER, including:

[15] This conjecture presents a framework to debate a revolutionary perspective of the existence of entirely new dimensions—levels of consciousness that transcend the suspected boundaries of our known Universe, or of inner space—states of existence which ancient philosophers possibly included in the all-pervading vibration: *"Aum"*. Early philosophers envisioned the state of infinity and continuous creation when they proclaimed that 'God' is in the smallest of the small, as also in the biggest of the big; this is in consonance with the Theory of ER, which postulates that every atom is like a universe and that every universe is atomic to a higher state of consciousness. Early seers placed no bounds on consciousness; scriptures depict the Supreme Lord meditating … apparently to an even 'higher state of consciousness' … thus reinforcing the conclusion that there is neither a beginning nor an end …

  - The structural similarities with Mendeleyev's 'Periodic Table' (PT), which ushered in a revolutionary way of conceiving the real world, and in which the systematic distribution of elements between the seven periodic 'levels'—based on the presence of 'empty' or 'filled' states of the outermost electronic orbits in these elements—is an elegant way of conceiving how Mother Nature organizes her objects of creation; this analogy is at the heart of our conjecture in the 'Theory of ER';
  - The seven 'rainbow' colors that are shown in Figure 2, represent a natural ordering of color, which we may be used to delineate the seven analogous domains in both, the 'Theory of ER' and the 'Periodic Table';
  - The octave represents yet another natural ordering of nature of sound or vibrations, which is analogous with the eight 'Planes of Consciousness' in TER; in other words, it is our conjecture that existential patterns occur in octaves.
- With reference to Figure 3, it would appear that
  - The middle of the domain is at the cusp of the 'uncurling' or 'unfolding' of the next higher dimension; in the case of the little girl in the 'Datum Domain', she is essentially three dimensional, whereas her analogous states in the 'Quantum' and 'Cosmological' domains would correspond to 'SUSY' (two dimensional) and 'Galactic Clusters' (four dimensional 'space-time'), respectively;
  - The peripheral boundaries represent the referential planes where the dimensional dilation undergoes a rapid transition from a state of low observability to high observability.
- With reference to Figures 4 and 5, it would appear that:
  - The existential patterns at the cusp regions between domains are characterized by a structure that is similar to that of the atom or the solar system in our 'Datum Domain'. Both have a central location of a nucleus and sun, as well as a shared similarity in electrons that circle the atom's nucleus and the planets circling the sun, respectively. It has been conjectured that these elemental 'inert' states—in much the same way as the inert gases in Mendeleyev's Periodic Table—represent the building blocks for the unfolding domain;
  - The middle of the 'Datum Domain', most poignantly captured by the icon of the little girl in the middle of the images in figures 1, 4 and 5, represents an evolved or 'lively' state of consciousness, it is the culmination of a building process in which the 'atomic' particles have combined progressively through a series of well defined natural processes—such as the laws governing the formation of DNA, to the development of 'living' cells and so on, culminating at the middle of the domain into living things. Human beings represent the highest form of intelligence that is known to exist in the Solar System;
  - This existential pattern—with 'inert' states of consciousness in the cusp regions and 'lively' states in the middle of each domain—is believed to be prevalent in all domains;
  - The complexity of these 'lively' states is conjectured to range from the least complex 'point' dimensional form in the lowest 'Zeroth' Domain, to the state of human existence in the middle and fourth 'Datum Domain', and progressing in complexity as we traverse to the higher domains.

We have refrained from making reckless conjectures that cannot be justified by observable scientific and natural phenomena.

References:

[1] Bertrand Russell, *The ABC of Relativity*, Mentor Books, May 1959.

[2] Professor Stephen W. Hawking's web pages: http://www.hawking.org.uk/

[3] Music and Science, *Dictionary of the History of Ideas*; http://etext.virginia.edu/cgi-local/DHI/dhi.cgi?id=dv3-32

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Appendix 1

Theory of Analogy [A1]

An analogy is a comparison of two things that are similar in some way, but otherwise not alike. The two things have shared characteristics (similarities) and unshared characteristics (differences). An analogy compares a familiar or known concept (the analog) to a less familiar or unknown concept (the target). The term analogy, used in its specific sense, denotes an explicit comparison of the elements of the analog and target. To propose an analogy, or simply to understand one, requires taking a kind of mental leap. A successful analogical reasoning process requires a map or transfer appropriate characteristics from the known identity to the unknown identity in one-to-one correspondences.

For example, a person makes sense of the analogy that relates an atom to our solar system by recognizing the shared central location of a nucleus and sun respectively. Likewise, a person sees a shared similarity in location of the electrons that circle the atoms nucleus and the location of the planets circling the sun. These mappings involve one-to-one correspondences between the nucleus and the sun and between electrons and planets. This analogy uses the more familiar planetary system as an analog to help explain the less familiar atomic structure.

A simile is basically a metaphorical comparison that uses the words "like" or "as" in its statement. For example, the metaphor "*A cell is a city*" can be converted to a simile by adding the word "like". The explanatory power of the expression: "*A cell is like a city*" is not revealed until explicit points of comparison of a cell (the target) and a city (the analog) are delineated. For example, there is a metaphorical correspondence between a power plant generating energy for a city and the mitochondria of a cell generating energy for that cell. Another possible one-to-one correspondence match is a city government and a nucleus based on their shared role of controlling what happens in a city or cell respectively. Such clear mappings of one-to-one correspondences between the analog and the target are essential for effective use of analogical scientific explanation. This analytical mapping does not deny the aesthetic appeal of a metaphorical expression. Even before students map cell organelles to parts of a city in one-to-one correspondence, they may enjoy thinking of the cell's functioning in terms of a city's hustle and bustle.

Kinds of Analogies

A domain is a broad field of knowledge. In analogizing, the two things compared may be drawn from the same domains (within-domain) or from different domains (between-domains). An example of a within-domain analogy is using a solution to a particular chemistry problem to serve as a model for solving a similar chemistry problem. An example of a between-domain analogy may be taken from the history of science. The structure of an atom (from the domain of physics) was first compared to our solar system (from the domain of astronomy) in that electrons revolve around the nucleus of an atom as planets circle our sun.

Analogies may require more critical thinking to identify how two things drawn from different domains may be said to be alike. For example, it may be challenging to find links between a city and cell structure to support the analogy: "*A cell is like a city*". It takes time to decipher how it is possible to call a cell a city. It may be easy to map the city limits to the concept of the cell membrane, since both entities define boundaries and must be passed through by anything entering or leaving. However, it is more difficult to match the ribosomes or endoplasmic reticulum of a cell to appropriate parts of a city. But as each part of a cell is matched to a correlate in a city (e.g., endoplasmic reticulum and the city's highway system), the analogy becomes a powerful explanation for cell structure and function.

The challenge to analogical reasoning relates to the accessibility of the similarity that must be recognized along the continuum from the almost literal to the metaphorical or simile. In the case of the analogy: "*A cell is like a city*", the similarities are deeply embedded. Ultimately, the similarities between the two things compared in any analogy must be meaningful to the thinker.

Analogizing Processes

The essential processes required for analogizing are: selection, mapping, inference, evaluation, and learning. A familiar analog is selected or chosen as an analogical source of enlightenment regarding the target concept. The shared characteristics or similarities are mapped from the analog to the target. At the same time, unshared characteristics or dissimilarities are noted. Inferences about the target are made based on this comparison and contrast of analog and target. These inferences are evaluated or judged for their efficacy in explaining the target. Ultimately, the thinker gains a better understanding of the unfamiliar target concept through analogical thought.

Selection of a familiar thing, an analog to help explain a less familiar thing—a target—is a difficult task. Each person has a different knowledge base and different life experiences, which together determine the quality of familiarity in a potential analog. Selections should therefore be based on identification of fruitful linkages, or similarities, between the analog and target. These similarities must be mapped from the analog to the target.

Mapping transfers descriptive attributes, conceptual relations, or both from the analog to a target. In some analogies, the two things compared may share similar descriptive properties perceived by the senses. For example, a plant cell may be compared to a box on the basis of a similarity in shape. In such an analogy, a shared characteristic of the objects is highlighted. Identification of such perceptual surface properties of the analog and target may be useful in building meaning.

An **inference** is part of the analogizing process. The analogy seeker somehow must use what she knows to reason from an initial guess or surmise to a conclusion based on what she knows or researches. From this perspective, inference is a process essential to and incorporated into the steps of selection, mapping, and evaluation.

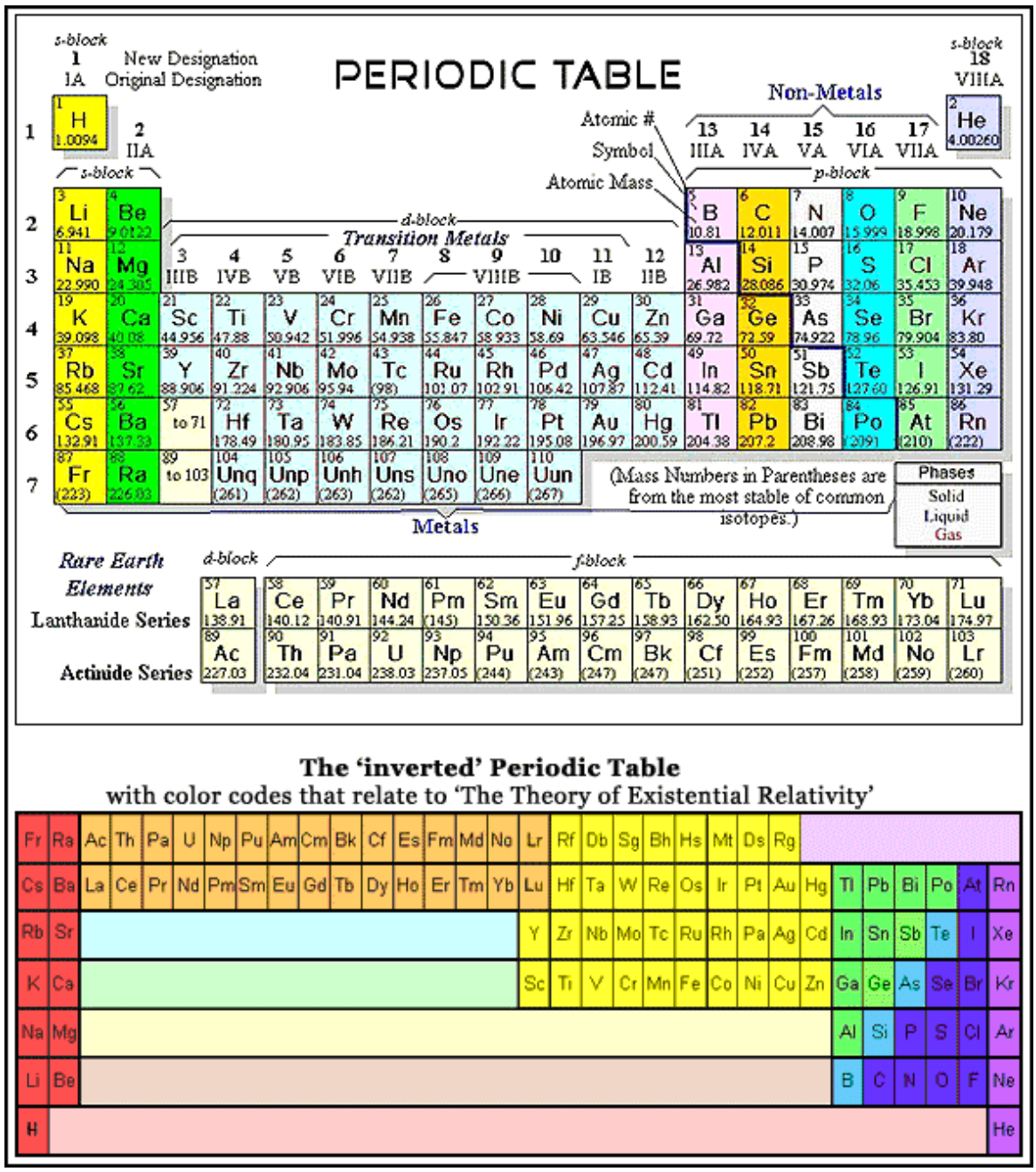
Evaluation relates to the efficacy of inferences made and their usefulness in understanding the targeted concept. It is important for the thinker to judge the learning potential of the analogy, since it is possible for analogical reasoning process to lead the thinker to a wrong conclusion.

Learning evolves from the dynamic processing of prior knowledge and novel concepts. From the start, the learner feels empowered by her understanding of at least half of the analogy—the familiar analog. She also accesses prior knowledge within the targeted domain to help her learn the new target concept. Eventually, the learner takes full ownership of the target concept and no longer uses the analog as a prompt for understanding.

References:

[A1] Hackney M W and Wandersee J H, *The Power of Analogy*; http://www.nabt.org/sup/publications/promote.asp

Appendix 2



The 'inverted' Periodic Table

with color codes that relate to 'The Theory of Existential Relativity'