Questioning the Foundations
5-Dimensional Universe

Contents

ABSTRACT

This essay is about introducing a new term Anti-Konservation as defining characteristic of space. By doing so we overtly do away with legacy of fixed (no change) space carried from Cartesianism. The benefits include a 5-D view of universe 'Space contains Energy' and integration of many fundamental laws with explanation for some astronomical observations.

PREFACE

In search for assumption to address in this essay on "Questioning the Foundations", I googled internet, and found following Newtonian era definitions of prevailing philosophies (Science & astronomy);

> ***Cartesianism[1]***: *A school in philosophy and natural science during the 17th and 18th centuries whose theoretical source was the ideas of the French philosopher R. Descartes. The self-evidence of consciousness (Descartes' "I think, therefore I am"), as well as the theory of innate ideas, forms the starting point for Cartesian epistemology. Cartesianism upholds a metaphysical dualism of two finite substances, mind and matter. Cartesianism is characterized by a consistent dualism—an extremely sharp division of the world into two independent substances—extended substance and the thinking substance. However, the problem of their mutual interaction within a thinking being remained fundamentally unresolved.*
>
> *Characteristic of Cartesianism was the development of a rationalistic mathematical (geometrical) method. Cartesian physics considered everything extended to be corporeal, thus rejecting the idea of empty space.*

Copernicanism[2]: *the fundamental theoretical basis of modern astronomy, first demonstrated in the early 16th century by Copernicus, who showed that the earth and the other planets orbit around the sun. The major features[3] of Copernican theory are:*

1. *Heavenly motions are uniform, eternal, and circular or compounded of several circles (epicycles).*
2. *The center of the universe is near the Sun.*
3. *Around the Sun, in order, are Mercury, Venus, Earth and Moon, Mars, Jupiter, Saturn, and the fixed stars.*
4. *The Earth has three motions: daily rotation, annual revolution, and annual tilting of its axis.*
5. *Retrograde motion of the planets is explained by the Earth's motion.*
6. *The distance from the Earth to the Sun is small compared to the distance to the stars.*

The result of the search indicates; philosophers wishing to communicate their observations, interpretations and conclusions had to search for right words. They succeeded most of time. The words used were able to communicate their observations & interpretations. With contemporary interpretations of words used, they sound ambiguous like the word 'universe' in statement 'The center of the universe is near the sun'.

We now have a much stronger vocabulary to communicate. Contemporary science has developed on legacy vocabulary provided by Newton (mathematics, calculus. . etc) to enable communications among thinking people. Not being

one among contemporary physicists, I share the problem of communications. Some words used in my essay may have a different linguistic meaning. Let us begin with identifying these words;

- **Reality**: That which exists intuitively to humans. Examples being space, matter, pain, happiness. . etc.
- **Identity**: Identity is measured reality. Examples are Length, Mass… Pain and happiness are not identities. Identity may share the name with the Reality and represent only part of the namesake. In such case, the total existential quantity of identity is Reality.
- **Measurement**: Measurement involves use of an identity as Unit of Measure, and magnitude assessment by comparison of another identity from same reality.
- **Physical Number Set**: It is subset of Cardinal Numbers that can be used to express magnitude of a reality.
- **Konservation**: A concept similar to conservation but excludes neutralization. It is characteristic of reality that is carried over to its identity and reflects in its measurement.
- **Anti-Konservation**: Anti-dote of Konservation, that allows for change in magnitude of identity. Similar to Konservation, it is characteristic of reality that is carried over to its identity and reflects in its measurement.
- **Host Reality**: Host reality is a reality in relation to a concept. It has no characteristic not related to the concept. The concept defines the reality and vise-versa. Examples are Knergy is host reality to Konservation and Space to Anti-Konservation.

In this essay, I will try to communicate on missed concept; namely Konservation and 5-D view of the universe.

SUMMARY

Human inquisitive search for order led to evolution of abstractions on nature. These abstractions followed two paths. One set of abstractions concerned the changes that man can bring about. The other set being the changes in nature he can not control. Text *Descartes' "I think, therefore I am"* [4]– found in literature indicate the evolution of physics (Ordered Human Knowledge) from the first set of abstractions.

Cartesianism upheld a mystic consistent dualism of two finite substances, extended substance (matter) and the thinking substance (mind). René Descartes revolutionized human thinking, linking Euclidean geometry and algebra using the Cartesian coordinate system. In era of Newton, the focus shifted from *Cartesian epistemology*[5] – concerned with the nature and scope (limitations) of knowledge to algebraic precision of Newtonian physics. The

contemporary view of universe (existence of matter in 3-D space) is gift of philosophers of Newtonian Era. Newton's conception of the Universe based upon Natural and rationally understandable laws changed our thinking about nature.

'Matter in 3-D space' world view is now integrated into human intuition.

Post Newton rationalization relates to definition of space from fluid to a void. The ambiguity on number of space dimensions is open for resolution.

The most powerful abstraction is found in mathematics – Georg Cantor's set theory. It extended natural numbers to transfinite numbers. With this a rational and logical world is built around numbers as objects in themselves.

Proposition I; It is proposed that only a subset of Transfinite (cardinals and ordinals) numbers can be used in quantitative measurements. We call it Physical Number Set.

Conservation is an abstraction on no-change behavior of matter in quantitative observation with respect to its properties of inertia and gravitation. This has been diluted with neutralization over time, as it got applied to other parameters of matter, like charge, momentum etc.

Proposition II; To bring clarity to difference between realities like matter Vs Charge a concept 'KONSERVATION - conservation excluding neutralization' is proposed. It is proposed in conjunction with its antidote ANTI-KONSERVATION.

Proposition III; Space is host reality for ANTI-KONSERVATION and KNERGY (Matter) is proposed as reality of KONSERVATION.

Knergy as a natural element has two dimensions - absolute magnitude and chronological - sequential order (Intuitive Time). The product is the Knergy that does not change in magnitude. This translates human intuition 'matter in 3-D space" to "Space contains Knergy" as law of nature.

Proposition IV; Composite Universe has five Dimensions.

- Three continuously variable dimensions of Space
- One discretely variable magnitude
- Chronological dimension mapping onto one of space dimensions

The resulting 5-D universe is compatible with observations leading to postulates of special and general relativity, astronomical observations as well as fundamental laws of physics.

SUBJECT

Science acts as organized, communicable repository of human knowledge. Science is also a method to refine human intuition. By updating our knowledge about the universe, we change interpretation of observations that form base for human believes, behavior & Intuition. Measurement is communicable part of science. In the expression for identity, reality is present as the unit while comparative magnitude as a number.

The set of numbers that can participate in a measurement is a subset of mathematical numbers. This subset represents the complete reality, and an individual member an identity – a specific measurement on reality.

PHYSICAL NUMBER SET

Discussion below is to understand the usability of numbers (transfinite and zero) in measuring reality and identify the subset for use to express magnitude of reality.

Transfinite Numbers

The mathematical numbers are symbols that can be used to label objects distinguishing them from each other. When the objects are repeatedly picked in same order, the labels attain additional meaning – the number represents the sequence of picking (the total object quantity picked). The label represents a set of objects with count that equals the label sequence. This gives us Counting numbers or Integers. The labels can be collected in a set and counted as objects.

In set theory, Ordinals (1^{st}, 2^{nd}, 3^{rd} . . .) are whole numbers used for counting. When the objects are collected in a set, the number that represents the count of objects is the cardinality of set. Georg Cantor defined the cardinal and ordinal numbers and their arithmetic.

Set can be used to identify reality. There is a unique set (Empty/Null Set) with no members. This set as an object is important in mathematics. When this is considered as valid for counting, the cardinality of an ordered set that include all ordinals up to N, is N+1. The inclusion of zero (Empty/Null Set) as a viable mathematical object at par with other numbers enables indefinite extension of mathematical numbers (nominal number) using recursive logic.

Georg Cantor's set theory extends the mathematical numbers to include Transfinite numbers. Aleph-null, $\aleph_0$, is defined as the first transfinite cardinal number and is the cardinality (ω-omega) of the infinite set of the natural numbers. These numbers "$\aleph$" are called transfinite numbers.

The finite ordinals (and the finite cardinals) are the natural numbers: 0, 1, 2, …, The least infinite ordinal is (ω-omega), is identified with the cardinal number $\aleph_0$.Whereas there is only one count-ably infinite cardinal, namely $\aleph_0$ itself, there are uncount-ably many countable infinite ordinals. The set of numbers representing a reality is

$$0,1,2,3,.....,n,..;\aleph_0,\aleph_1,\aleph_2,\aleph_3,.....\aleph_n,.....$$

Thus the magnitude representing number is limited to one countable infinite cardinal number. In a set of identities representing the reality we have uncountable, positions for 'count-ably infinite'. Examples of ordinal ranges are;

0, 1, 2, 3, ...
ω, ω+1, ω+2, ω+3, ...
2ω, 2ω+1, 2ω+2, 2ω+3, ...
3ω, 3ω+1, 3ω+2, 3ω+3, ...
$\omega^2, \omega^2+1, \omega^2+2, \omega^2+3,$. . . . . .
$\omega^2+\omega, \omega^2+\omega+1, \omega^2+\omega+2, \omega^2+\omega+3,$. . . .
$\omega^3, \omega^3+1, \omega^3+2, \omega^3+3,$. . . . . .
$\omega^\omega+\omega, \omega^\omega+\omega+1, \omega^\omega+\omega+2, \omega^\omega+\omega+3,$ . . .
. . . . . .
. . . . . ε_0

Non Existence of Empty Set

An identity that does not exist can not be measured. Number Zero, The empty set can not be used in measurement. Its existence is limited to the realm of mathematics. The two sets below represent the same identity;

- Set Theory Set {ω+1, ω+2, ω+3, ω+4, ω+5, ω+6} of cardinality 6
- Physical Number Set {ω, ω, ω, ω, ω, ω} of cardinality 6

Among numbers representing a physical identity the following holds true;

$$\omega + n = \omega = n + \omega$$

$$\omega - n = \omega = -n + \omega \quad \text{.....(1)}$$

Where ω is number infinite and n counting number

Equation (1) can be read as; When a reality can be measured to be infinite, it can be created (+n units) or consumed (-n units).

Unit of Measure

Both ordinal & cardinal number can be used to represent a measure on the object, establishing its quantitative identity. In such a case, ordinal number is seen as cardinality of set of unit objects composing the measured object (identity of reality). Substituting (1) for ordinal range, The Physical Number set

to represent a reality in general can be expressed as a set of uncountably infinite set of ordinal numbers;

$\{1\omega^r, 2l\omega^r, 3l\omega^r, 4l\omega^r, 5l\omega^r, 6l\omega^r, \ldots\ldots\ldots\ldots \varepsilon_0\}$

In general, the ordinal representing the identity is $nl\omega^r$. Here l (Lowercase L) is the level (1 to ω) of number range and r the infinite order (0 to ω). In identifying the reality suitable for Unit of measure, $l\omega^r$ is absorbed into unit of measure. The level 'l' represents the comparative size of units used for measurement. Example change of measurements units from kilograms to grams gives us comparative level for conversion as '1000'. The infinite order and level of identity appears as a projection of reality on observer. It is a characteristic distinguishing different realities to the observer.

An infinite order and level can be attributed to reality, and an identity measured by uncountable set of 'count-ably infinite' ordinals.

$$.reality \equiv \{1,2,3,4.....set.of.countin.numbers\}(l \in (set.counting.numbers))\omega^{r \in set.of.counting.number}$$

The number 'lw^r' representing unit selects the set of the identity in the uncountable superset.

The number used along with unit of measurement to represent an identity is;

$R=R_1/R_u$ where $R,R_1,R_u \in set.of.rational.numbers$

The Physical Number set to represent a reality in general can be expressed as a set of numbers;

$$n \in (1,2,3,4.....set\_of\_rational\_numbers)$$

If the identity can measure to be infinite ω, then it's number is

$R=R_1/(R_u=R_2-R_3)$ where $R,R_1,R_2,R_3 \in set.of.real.numbers$

If the magnitude can be measured to be infinite in units of measure,

$\Re \in$ set of real numbers.

After accounting for translation of unit of measure as well as infinite order measure of identity, we have on *Physical Number Set as* set of real number:

$$n \in \Re.....set\_of\_real\_numbers$$

Two realities can be distinguished from each other, by their infinite order. Examples available are reality of point (0 infinite order), line (1 infinite order), area (2 infinite order) and volume (3 infinite order) refer to projections of reality of space on observer. Some other realities with respective infinite order are; time (1 infinite order), energy (-1 infinite order), Knergy (0 infinite order) and speed (0 infinite order).

Observation & Measurement

Environment for Observation are set up, such that Cause and effect (If Then) logic begins at the object and ends with a signal to human brain. Environments

for measurement are set up so that the Cause and effect logic ends into a number. The environments need calibration both for value and interval. Magnitude of any third object can be related to two standard objects used for calibration. The first defines the unit of measurement and along-with second an interval is defined. When only one standard object is used in calibration, number read (Zero Error) in absence of object is used, in assigning a number as measure of object.

Basic Observation[6] with binary result identifies the object. The result indicates the presence of object in magnitude greater than or equal to unit. Identification can also be construed from measurements, when the environments rule out other possibility, as below;

- Positive observation is identified with object's measure of unit or more.
- Negative observation is identified with absence below unit of measure (Zero).

In this case, units used in observation and measurement are same.

The units used in observation (UOO) and measurement (UOM) have differing primary purpose. While observation essentially results in a binary result that establishes presence of the object (along with adjectives such as big, small, green, red etc), measurement is quantitative evaluation on object. Same unit may not be suitable or even available for both purposes.

Physical Number Set

In case reality's magnitude is continuously variable in its identity, the unit of observation differs by at least one infinite order from unit of measure. Infinite order 1, defines two units one each for set (infinite order 0) and (infinite order 1). If unit of observation belongs to lower order set, the identity belongs to set of +ive order realities. If it is reverse, it belongs to set of –ive order realities. If both belong to same set as unit of measure it is reality with zero infinite order. Infinite order of reality defines relation-ship between observation and measurement units as below;

= 1, when Infinite Order Measurement Unit > Observation Unit
= 0, when Infinite Order Measurement Unit = Observation Unit
=-1, when Infinite Order Measurement Unit < Observation Unit

Thus we have complete number range to represent magnitude of physical reality in identity as below;

$\{1\omega r, 2 1\omega r, 3 1\omega r, 4 1\omega r, 5 1\omega r, 6 1\omega r, \ldots\ldots\ldots.\}$	$r<0$
$\{1,2,3,4,5,6 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\}$	$r=0$
$\{1\omega^r, 2 1\omega^{r,} 3 1\omega^{r,} 4 1\omega^{r,} 5 1\omega^{r,} 6 1\omega^{r,} \ldots\ldots\ldots\ldots\}$	$r>=1$

KNERGY

The word energy derives from Greek (energeia), appears for the first time in the work of Aristotle in the 4th century BCE. The concept of energy emerged out of the idea of living force. In 1802 lectures to the Royal Society, Thomas Young was the first to use the term "energy" as capacity to do work. "The product of the mass of a body into the square of its velocity may properly be termed its energy". Albert Einstein proposed mass–energy equivalence in 1905. This brings into question – energy and mass being same reality. There exists divergence on whether mass & energy are inter-convertible or inertia & gravity characteristics are directly attributable to energy.

General relativity provides insight into inertia and gravity as result of space geometry, a result of presence of matter. This attribution of mass characteristic to space makes the energy-mass conversion view persist.

Energy has been variously defined over time, beginning with perception of briskness of earthling, capacity to do work to the reality identified with conservation.

Konservation

Today, energy is primarily a host to the conservation concept. Conservation defines energy and vice versa. The conservation concept has wide applicability and encompasses neutralization. However, all directed experiments to observe complimentary (-ive) energy has produced no result. It places energy squarely at par with matter. Matter too is without a complimentary matter (-ive matter) for neutralization. The statement "can neither be created nor destroyed (or neutralized)" is a valid for Matter & Energy alike.

To distinguish this conservation without neutralization, we give it new name Konservation. In addition we consider that it defines a new reality 'Knergy'.

Knergy: The three elements of Energy, Matter and Time are combined into the reality of Knergy- host reality of Konservation (Conservation without neutralization). Infinite can't be a measure of Knergy. If this is feasible, then creation and consumption is possible of Knergy in the units of measure.

Natural Quantization

Since a unit, identifies magnitude of reality to unity and can be defined as difference between two identities. We have a natural unit (minimum) for measuring Knergy. Knergy has to exist as integer multiple of this unit. If not, we can construe a unit, from difference in two measurements, in which the magnitude and individual identity measures to infinite with this new unit of

measure. The reality is no more Konserved. The natural unit not only defines the minimum magnitude of Knergy, but also minimum difference Knergy contents of two identities.

The magnitude of Reality (Knergy) in an identity is therefore limited to a finite cardinal in natural unit. If an observer uses units other than the natural unit for measurement, we have different numbers representing the measure of same identity. In general, the number can be represented by a real number along with the unit.

The measure of Identity
= N natural units (Counting Number – Infinite order 0)
= R units of Observation (Real Number – Assumed Units)
= R units of Measurement (Rational Number – Infinite Order <> 0)

This natural quantization on Matter (Knergy) contents can be related to uncertainty principle, photo electric effect, and laws governing formation and properties of mass particles.

Dimensions of Knergy

An object itself can be considered as identity of a composite reality. A reality may or may not be observable. An object may consist of multiple identities of which some are observable (with infinite order of 0 or1). Maximum infinite order of an observable reality is unity. Realities corresponding to identities composing the object are said to be parent realities of composite reality. Dimension is an Observable parent of a reality. The object is said to have as many dimensions as number of such identities composing the object.

By definition, we have attached an infinite Chronological dimension to Knergy. This is independent of quantity. By definition of Knergy (Host reality of Konservation), it has two parents;

- A chronological Dimension
- A magnitude Dimension

Chronological Dimension (Time)

Knergy exist unbound in Time (Chronological dimension). In Chronological dimension it exists over the infinite interval.

Chronological Dimension = ω Chronological Units

Observing realities

ω Chronological dimension indicates that reality is not observable. For measurability, it is required that the magnitude remains firm during observation. With infinite magnitude, the measure is indefinite in units of measure as per (1) above. With this measure the reality can be created or consumed during observation, changing its magnitude. It is measurable through its identity 'Time'.

Time = tω Chronological Units = t time-units.

Since, with finite magnitude, its magnitude remains stable during observation. The chronological dimension is observed in the units in which it measures to be finite – time units, observable units – the measure of chronological dimension is a real number to account for unit change (chronological units).

In mathematical terminology, ω belongs to set of cardinal numbers, while t belongs to set of ordinals. The reality of chronological dimension is sum of its identities (time) or sequence of instants. The measured value called time by observer is instance interval 'T' between start and end of observation. The infinite order of time is 1. In Pico-Physics Time is identity of 'Samay' the chronological realty. The reality whose measure is open to extend to infinity has minimum infinite order of 1. If it has finite existence it's infinite order is 0.

Units of observation: Infinite order 1, defines two units one each for 'infinite order 0' and 'infinite order 1' sets. If unit of observation belongs to lower order set, the identity belongs to set of +ive order realities. If it is reverse, it belongs to set of –ive order realities. If both belong to same set as unit of measure it belongs to set of zero realities.

Infinite order of reality defines relation-ship between observation and measurement units as below;

= 1, when Infinite Order Measurement Unit > Observation Unit
= 0, when Infinite Order Measurement Unit = Observation Unit
=-1, when Infinite Order Measurement Unit < Observation Unit

Magnitude Dimension (Energy)

By definition, Knergy has zero infinite order; its measurement & observation unit belongs to same infinite order. It is everlasting. This gives it time chronological dimension with infinite order 1. To this chronological dimension, another dimension (infinite order -1 shall be added to result in zero order Knergy. Let us call the identity that contributes to its magnitude as Energy.

If E is the identity of reality energy constituting Knergy, and 'T' the instant interval, we have for unit Knergy object (N = 1);

$$E \times T = 1 \quad \ldots . \quad (2)$$

E is continuously variable (measures to a real number) and hence can be measured to a transfinite number in suitable units. The linguistic definition of Knergy assigns infinite order 0 to Knergy. Chronological dimension as infinite, the other dimension is Energy.

The equation (2) defines the relationship between natural units of Knergy, Energy and Time. In observer's unit of measure for energy and time, the natural unit for Knergy translates to Plank's constant.

The natural Knergy unit is identified with plank's constant.

The identity of unit Knergy is synonym with photon, corpuscular light (Photon) particles.

The unit Knergy object relates to contemporary corpuscular light (Photon) particles. The energy of photon varies inversely with time (directly with Frequency).

As antidote to Konservation, we define Anti-Konservation.

SPACE

Space occupies an important place in human intuition.

In the seventeenth century, Gottfried Leibniz, the German philosopher-mathematician, and Isaac Newton, the English physicist-mathematician, set out two opposing theories of what space is. Leibniz held that "space is that which results from places taken together". Leibniz echoed *René Descartes* (1596-1650) view of space as extension of matter in length, breadth, and depth. Leibniz argued that space could not exist independently of objects.

Newton took space to exist independently of matter arguing with help of the bucket argument[7]. Newton's light corpuscles and "Space independent of matter" co-existed with Descartes' Space - a plenum occupied by "ether[8]", which, imperceptible to the senses, is capable of transmitting forces on material bodies immersed in it. Descartes assumed that the "ether" particles are in constant motion, but, as there is no empty space for them to move to, he inferred that they move to places vacated by other ether particles.

Physical properties of Space have been discounted as experiments to find "Ether" failed. Contemporary science considers space as devoid of physical

properties and it cannot move. It can be measured and value cannot change with time.

Contemporary space is a residual concept of Cartesian Space on removal of matter (Ether). It is an infinite 3-Dimension continuum which can be measured and fixed (it is neither created nor destroyed).

This is clearly reflected in concept of inertial frame of reference. The nature of space is now embedded in 3-D inertial frame of reference.

The Proposition – Anti-Konservation

The context of phrase 'cannot move for space in Cartesianism' is the observation that in the universe, we experience objects that move relative to each other. We do not observe any motion for space as an identity.

It is proposed to remove constrain of no-change (neutralization, position, magnitude) to define ANTI-KONSEVATION. It is used as defining characteristic of space.

Matter is extended substance that extends into space. (In terminology of Pico Physics, it is unary law; Matter exists in space.) It moves in space. The proposition Matter is conserved originates from observed motion of matter in space.

Conservation of matter was further extended to chemical reactions under normal laboratory conditions. Matter is neither created nor destroyed, and elements are not transformed into other elements. Therefore, equations depicting reactions must be balanced; that is, the same number of atoms of each kind must appear on opposite sides of the equation.

Newtonian physics took conservation further and used it to provide existential reality similar to matter for abstract (Capacity to do work) concept. It named it as Energy. Along with inertia it used energy as new key word describing the universe of human observation. Conservation was extended successfully to define potential energy or internal energy. The success in return affected the concept itself, to include neutralization. This neutralization makes conservation applicable to many different areas with scintillating results.

Conservation is a combination of "neither be destroyed nor created" as well as neutralization concepts (Can be neutralized by opposite). It does allow motion.

Cartesianism concepts of Matter and Space have developed in their own right with increased knowledge of nature.

Contemporary concept of space gives it a strict conserved character –

- Can Neither be created nor destroyed
- Can not be neutralized
- Can not move
- Can be measured

We can have different level of conservation for an identity based on one or more assigned characteristics. For the purpose of the discussion we propose the following;

Permissible Action	Conservation Charge	Konservation Energy	3-D Reference Frame Space	Anti-Konservation Space
Can be created or destroyed	No	No	No	Yes
Can be neutralized	Yes	No	No	Yes??
Can move/Transfer	Yes	Yes	No	Yes
Can be measured	Yes	Yes	Yes	Yes

For clarity

1. Conservation is identified with contemporary conservation of charge;
2. Konservation is identified with Energy, Mass etc. after removing neutralization from Conservation.
3. The contemporary concept of space (An immobile, infinite 3-Dimension continuum which can be measured but neither created nor destroyed).
4. Space in PicoPhysics is malleable to everything including creation, neutralization, motion and measurement.

Anti-Konservation allows for creation, generation, neutralization, movement and measurement.

Space Density

Real Space (R-Space) is proposed as Host Reality for Anti-Konservation. Geometric space (G-Space) is proposed as Host Reality for Contemporary 3-D inertial frame. The ratio of R-Space to G-Space is space density. It can be seen as ratio of measure of space by two observers observing each other. When observer A, observes B as an object, the inertial frame of observer 'A' is G-space and that of 'B' is R-space. When two observers are identical, the observed space ratio is identical.

The Rational (For Space Is Anti-Konserved)

The rational for anti-conservation lies in many cosmological observations. These are currently understood based on The Big Bang and the Expansion of the Universe. This understanding is under constant challenge.

1. Some recent observation call for accelerating universe that the universe appears to be expanding at an increasing rate.
2. The observation leading The Baum–Frampton[9] postulating an oscillating universe.

In these models, we place ourselves at center of the universe with universe oscillating with respect to center – similar to sun at center of universe in **Copernicanism.**

The expansion rate dependency on distance in big-bang is troublesome considering laws of inertia. It calls for de-bunching effect to be observable. It shall be visible in large scale structure of the universe. De-bunching will make matter density measurement guide us to center of universe. However, matter is uniformly distributed in space and unable to guide us to center of universe.

These observations along with observations on

1. Gravitation - Force & Red Shift
2. CBR – Cosmic Background Radiations
3. Uniform Density of matter in universe
4. Center of Universe related paradoxes
5. De Broglie wavelength shift

All point to a universe, where contemporary (Holistic) understanding of Space as a conserved identity is unable to sustain the observed facts. Conservation of space is leading us on a path of constant hypothesizing.

Anti-Konservation as a property of space, provide us an opportunity to attribute the observations to the process of Energy consuming the occupied space, which is generated at a constant rate (Hubble's constant) in free space. Due to low value of Hubble's constant, on smaller scale (inter galaxy), space do not appear to change on human life-time scale (with-in few human generation, space don't appear to change).

It will also create a clear distinction between space and matter and possibly end attribution of physical properties to space. Anti-Konservation concepts provide a new direction to be at peace with the astronomical observations.

VIEW OF UNIVERSE

Newtonian Era (3-D Fluid)

Descartes view of universe seems to be an extension of human observation of fish (swimming) in Sea and birds (flying) in sky to existence of matter in space. Arrived to develop contrast between mind and matter. This identifies space as some kind of light fluid, unable to resist motion of matter. This notion of light fluid has been discussed and discounted in contemporary physics.

Contemporary (3-D infinite continuum)

Big Bang Theory can be considered to include the Contemporary view of universe as a 3-D infinite continuum that does not change and houses matter. General theory of relativity deals with geometry of space and behavior of matter in space.

Proposition (5-D Universe)

The proposition to incorporate anti-Konservation as property of space, gives us 5-D view of universe. The five dimensions include 3 dimensions of space (3-D infinite continuum), and 2 dimensions of Knergy (Energy and time of 2-D Matter). Knergy is mapped onto space with time dimension overlapping one space dimension (drift direction). This view is simply stated in three words of Unary law in Pico physics[10] 'Space Contains Knergy'.

The 5-D view provides 3 degrees of freedom to an object. Two are unmapped continuously variable spatial dimensions. The third space dimension is mapped to Time (Chronological dimension). (Time maps onto the dimension along the object motion, giving it a constant speed.) Freedom to assign a number too fifth dimension is conditional upon;

5^{th} dimension Magnitude X chronological difference
= Integer Number X UOM (for Knergy).

Thus value of 5th dimension is related to dimension in drift direction, as well as value, with magnitude represented by counting number in natural units. Thus the freedom for 3^{rd} & 4^{th} Value assignment to, continuously variable 3^{rd} space dimension, Time and Energy, is constrained by reality of Space contains Knergy.

A new perspective

(Added to influence decision/to be published later with full reasoning)

In PicoPhysics, Energy of an object is the rate of consumption of Anti-Konserved space by the object. As chronological dimension diminishes, so does the spatial dimension. As a result, spatial density of Knergy K_d and Energy E_d are related as

$$E_d \propto K_d^2$$

This identifies Knergy density with inverse square law field. Konservation of Knergy gives a basic principle for feasibility of elementary mass particles - integration of field over the volume of particle is discrete multiple of natural unit.

The variation in space density (Space heterogeneity) results in observation of different drift speeds (Velocity of light) and results in phenomenon such as refraction of light (Called Unary Interaction in PicoPhysics). Space heterogeneity results in change in direction of Knergy drift in space, which in turn may result into point centric motion – causing stable geometrical arrangement for existence of Knergy in space as material particles. A composite particle like nucleus of an atom is composed of series of particles, which give it the observed stability and reaction specific cross-sections.

The particle with unit Knergy content is photon. The turbulence in space caused by presence of Knergy extends beyond the particle volume. For photons, it results into phenomenon such as interference, diffraction etc. The photo-electric effect is the result of interaction of photon with composite particle. For mass particles it results in increased space density at particle singularity and gravitation phenomenon (attraction, deflection of light etc).

The deflection (caused by unary interaction, refraction) is towards higher density space which is sustained by drift of space towards matter particles where it is consumed. This explains gravitation red shift of emitted light from high density space around heavy masses.

If the spacing between these singularities is insufficient, they will merge (collapse) together, as space between them is consumed. In equilibrium, the extra terrestrial space (Re-generative) will generate the space consumed by mass singularities. This provides isolation of collapsing regions from other regions of space.

When high energy photons pass through the space, their dimension increases in the drift direction due to spatial re-generation. This results in observations of De Broglie wavelength shift of radiation from distant Stars or Supernovae. The decrease in frequency is a function of life time of photon in free space and its initial frequency. The Knergy present in the photon is consuming space as well. When the two consumption and re-generation balance each other, photon is de-linked from the source. It is now a constituent of cosmic background radiations CBR. The spectrum of CBR represents the relative motion of astronomical objects (as well as thermodynamic equilibrium attained from scattering by material objects).

Hubble's constant is a measure of generation rate of free space. While plank's constant relates rate of consumption of space with spatial dimensions. The energy distribution of CBR can be related to these two constants. This also provides us with rate of space consumption by energy.

A significant PicoPhysics prediction is, there is a physical lower limit to gravitational field of particles. The affected (and isolated) space volume is additive/proportional to contained energy-mass. This leaves scope for multiple isolated constellations of galaxies and/or complete universe. If there was a big-bang, there can be multiple big-bangs and may be observed contemporarily.

The mapping of spatial Drift dimension to chronological dimension of Knergy provides a uniformity of motion – drift with unit speed, as well as relaxation time to a particular distribution of Knergy in space. If the circulation/repetition rate is faster than the relaxation rate, it makes it stable - inert to change that may require change in consumption of space. This stability is observed in conservation of Energy. Thus conservation of energy (rate of consumption of space by Knergy) is an induced affect of Konservation.

Photons of wavelength lower than 7 cms and mass particles are all affected by this conservation of energy. The change in energy of these objects must be offset by another object. This change can occur as a result of exchange of Knergy between objects or by change in distribution of Knergy with-in. This provides us with two class of interaction between objects. Those that result without exchange of Knergy between objects are generally explained with action at-a-distance concept. Those with exchange of Knergy are particle exchange interactions. We don't need energy exchange particles for all interaction involving change in energy. This discounts need of particles such as gravitons etc.

The basic energy exchange particle is photon, it carries unit amount of Knergy with it. The necessary condition for its emission or absorption is balance of both Knergy & Energy. The indivisibility of Knergy makes complete emission or absorption a pre-condition of exchange interaction. (Photo-electric effect).

So a 5-D universe can answer some questions which has not be raised till to-date, but documented as laws of nature. It can merge some of diverse area of human knowledge into a single thought process. 5-D universe is geometric representation of Unary Law 'Space Contains Knergy'.

THE CAVEAT

When space heterogeneity is seen as the cause of De Broglie wavelength shift, the shift will be more in space regions with higher density of matter. A reasoned view provides high space density at surface of mass particles, which

gradually decreases with distance from the surface. Over large distances space heterogeneity can average out, but for distances within a galaxy, the variation in shift is expected to depend on direction of supernovae (Causing Radiations) relative to detector and immediate heavenly neighbors. We are not aware of any such co-relation or study conducted on this front.

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