

Cosmology and Unified Quantum Gravity Theory of the Universe

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Abstract

A unified quantum gravity theory of the universe is discovered and being proposed which explores the true dimensionality of all the physical variables of the universe like energy, EM- wave, entropy, mass, time, temperature, gravitation, etc. and merges the "Classical Theory", "Thermodynamics", "Quantum Mechanics" and the "Theory of Relativity of Albert Einstein" under a single umbrella by a newly proposed mass-energy equivalence phenomena.

The proposed quantum gravity theory based on the concepts of inverse dimensionalities of mass and time and the different types of "GRAVITONS", explores most of the cosmic mysteries of the universe, like the dimensionality of the universe itself, the geometry and thermodynamics of the different types of Black Holes, the Plasma State, the gravitational lensing, the cold nuclear fusion phenomena, the apparent grey look of the universe.

The units of the principal physical variables of the universe as proposed by Max Planck gets a new shape in the light of the proposed Theory of Quantum Gravity (QG Theory) in the form of either „push-forward gravitons" or „pull-back gravitons".

The limitations the existing laws of physics and the theories of relativities have been revealed and the quantum gravity theory of color physics and the building block concept of calculus have been introduced.

The world science would be experiencing a major turnaround at this proposition.

Keywords: Time, Mass, Volume, Energy, Quantum, Black Hole, Entropy, Plasma State, Nuclear Fission, Nuclear Fusion, Color Physics, Planck's Constant, Relativity, Force, Dimension, Quantum Gravity

TABLE OF CONTENTS

1. REVISITING DIFFERENTIAL AND INTEGRAL CALCULUS IN CONTEXT TOUNIFIED QUANTUM GRAVITY (QG) THEORY OF THE UNIVERS

- 1.1 Building Block Concept of Differential Calculus of the Physical Variables
- 1.2 Analysis of Fundamental Definition of Differential Calculus
- 1.3 Derivatives of Trigonometric Functions, Logarithm and Exponential Function ex

2. CONCEPT OF HYBRIDIZATION AND DE-HYBRIDIZATION

- 2.1 Proper Understanding of the π -Parameter
- 2.2 Concept of Positive and Negative Physical Variables, their Inverses and the Concept of Zero, Infinity, Square and Square Roots of the Physical Variables

- 2.3 Universal Energy-Equilibrium Relationship and Positive & Negative Inverse Physical Variables, the Concept of Real and Imaginary Numbers

3. FRUIT-SEED MODEL OF THE GROWTH OF MATTER

- 3.1 Concept of Time and Temperature
- 3.2 Concept of Volume and Velocity
- 3.3 Concept of Mass and Acceleration

4. UNIFICATION OF THE CLASSICAL DEFINITION OF TIME AND ENTROPY WITH THE QG THEORY DEFINITION

5. REPRESENTATION OF THE PRINCIPAL PHYSICAL VARIABLES IN REGARD TO QG THEORY IN 2- AND 3-DIMENSIONS

6. ORIGIN OF GRAVITATION

- 6.1 Gravitation-Time Composite Variable
- 6.2 Dimensionality of the Universe

7. **'HEISENBERG UNCERTAINTY PRINCIPLE', 'PLANCK'S CONSTANT, h' AND '2ND LAW OF THERMODYNAMICS'**
 - 7.1 Planck's Constant and Entropy
 - 7.2 Mass Defect and Entropy
 - 7.3 Isothermal and Adiabatic Process and Carnot Engine
 - 7.4 Convergence of 2nd Law of Thermodynamics and Heisenberg's Uncertainty Principles
 8. **CONVERGENCE OF PLANCK'S UNITS AND THE UNITS DERIVED FROM THE UNIFIED QG THEORY**
 - 8.1 Understanding of the Physical Variables as per Classical Theory in the Light of QG Theory and the Unification of the Physical Variables as Different Clusters
 - 8.2 Time and Growth of the Universe
 - 8.3 Dimensionality of Electro-Magnetic (EM) Wave
 9. **'BLACK-BODY RADIATION' AND 'ENTROPY-ENERGY HYBRID ROTATING WHEEL'**
 - 9.1 Dimensionality of Electric Fields and Magnetic Fields Delocalization of Mass (RDM) and Rate of Localization of Energy (RLE)
 - 9.2 Explanation of Black-Body Radiation Curves in Relation to Rate of De-Localization
 - 9.3 Phenomenon of Photo-Electric Effect in the Light of QG Theory and In-appropriateness of Photon Model of Albert Einstein
 10. **EVOLUTION OF DIMENSIONS OF PHYSICAL VARIABLES FROM 'ENERGY-TIME' HYBRIDS**
 - 10.1 Dimensionalities of Nuclear Fission, Plasma State, X-Rays, Supernova and Cosmic Rays
 - 10.2 Magnetic Field, Magnetic Potential in Connection with Electric-Charge and Electric-Field
 11. **QUANTUM MECHANICS AND QUANTUM GRAVITY, THE UNIFICATION HORIZON**
 - 11.1 Schrodinger Time-Dependent and Time-Independent Equations in QG Theory
 - 11.2 Quantum Mechanical Operators in Relation to QG Theory Derived Universal Wave Function
 - 11.3 Evaluation of Dimensionality of the Universe from Unified 'Quantum Mechanics – Quantum Gravity Theory (QG)
 12. **GENERAL THEORY OF RELATIVITY, BLACK-HOLES AND QG THEORY DERIVED 'GRAVITONS'**
 - 12.1 Discussion on Gravitation Dimensionality and their Significances
 - 12.2 Formation of Black-Holes, Phenomenon of Cold Fusion and Concept of Singularity
 - 12.3 Different types of Black-Holes and their Geometry and Thermodynamics
 13. **DELOCALIZATION AND LOCALIZATION OF MASSES AND ENERGIES AND ORIGIN OF SPACE EXPANSION, SPACE INVERSION, TEMPERATURE AND TIME**
 14. **MASS DEFECT AND GRAVITONS AND CONCEPT OF FLAT UNIVERSE**
 15. **SPECIAL THEORY OF RELATIVITY AND QG THEORY**
 - 15.1 Limitations of Special Theory of Relativity
 - 15.2 Limitations of The Newton's Laws of Motion
 16. **COLOR PHYSICS AND GRAVITONS**
 - 16.1 Dimensionality of Color in Regard to Light-Object Interaction
 - 16.2 Dimensionality of Color as Evolved from the Basic Definition of Color in Color Physics as an Integration of Energy Field
 - 16.3 Evolution of Newton's Color Wheel from QG Theory of Color
 - 16.4 'Mass-EM Wave Duality', 'Object Color - EM Wave Color Duality'
 17. **CHEMICAL THERMODYNAMICS IN THE LIGHT OF QG THEORY AND CRITERIA OF SPONTANEITY**
 18. **TRIGONOMETRIC FUNCTIONS AND GRAVITONS**

Trigonometric functions and Gravitons and mass and energy distribution pattern
 19. **UNIFIED QUANTUM GRAVITY – THEORY OF THE UNIVERSE**
 - 19.1 Dimensionality of Electric Charge and the Effective Dimensions of an Atom
 - 19.2 Dimension of Atom and Evolution of Time Graviton
 - 19.3 Orders of the Chemical Reactions and the Gravitons
 - 19.4 Concept of ' π -Graviton' and 'Anti π -Graviton'
 20. **THERMODYNAMICS OF SUPER ENTROPIC/ SINGULARITY GRAVITONS AND EVOLUTION OF MULTI-DIMENSIONALITY OF THE UNIVERSE**
 - 20.1 'Gravitational Waves' and Representations of the Gravitons in Regard to 'Thermal Expansion Co-efficient'
 21. **TRANSITION OF THE UNIVERSE FROM A COILED STATE TO A FLAT STATE (OR FROM AN INTEGRATED FORM TO DIFFERENTIAL FORM)**
 - 21.1 Order of the Universe and the Origin of the 'Push Forward' Gravitons
 - 21.2 Gravitation and Forces of the Universe
 - 21.3 Infinite Dimensionality of the Universe
 22. **CONCLUSION**
- APPENDIX I, II, III and IV and CONCLUSION**

Introduction

The universe to which we all belong, is an integrated or hybrid form of the numerous physical variables. Defining a physical variable by physics only, however, gives rise to a 'part definition' of the concerned physical variable. However, the said part definition achieves a full proof shape, only when it is being defined by mathematics and geometry too. Every physical variable needs to be described by three parameters, i) a distinct geometrical shape, ii) the logic of physics behind its formation and iii) a mathematical expression. Finally all the said three concepts need to be bridged and merged at a single point. This needs to be accepted as a rule of thumb in 'Science' while defining any physical variable of the universe.

Drawing the geometrical shapes of the physical variables like distance, area, volume,..etc is not much difficult but the world science has not so far educated us to draw the geometrical shapes of time, mass or velocity since as on date the unified scientific definitions of the said variables do not exist.

With the above said rule of thumb of unified definition of a physical variable in hand, in this article the geometrical shapes, the physics of their formations, the mathematical expressions for the physical variables like time, mass, entropy, temperature, gravitation. and the others etc. have been developed and described. The gravitational forces in the form of its super entropic form to the end gives birth to the 'GRAVITONS' and all the natural phenomena of the universe have been proved here to originate from the existences of the equilibrium between the different types of 'GRAVITONS', existing very much in the nature either in the form of 'push forward' or 'pull back' gravitons. This has been shown by a universal 'GRAVITON CYCLE' in this article.

The present proposition has linked the gravitational forces to the molecular attractive forces operating among the molecules of the matters of the universe. The thermodynamic parameter, 'entropy' which is the index of randomness too of the universe, is very much connected to the molecular attractive forces. The universe, in this article has been principally looked up as a trihybrid of molecular attractive forces, the entropy and the dimensionalities of the matters of the universe. For the first time in science in this proposition only, the physical variables like mass and time have been defined and diagnosed in regard to their inverse dimensionalities.

A proper theory of quantum gravity is in demand of the global science for the last couple of decades for the proper understanding of the physics of the constituents of the Cosmos and the physics and the numerous mysteries of the Cosmos itself. Based on this demand or the need of the day, a new unified theory of quantum gravity has been discovered based on the above said new trihybrid concept in science and is proposed here.

The proposed theory, which is based on 'universe building block' concept too, brings the four principal branches of science, the 'classical physics', the 'classical thermodynamics', the 'quantum mechanics' and the 'theory of relativities' under a single umbrella and explains most of the cosmic mysteries of the universe. Many new information or new concepts have been proposed here and all

the concepts have been merged at a single point by the logic and philosophy of physics, mathematics and geometry.

1. Revisiting Differential and Integral Calculus in Context to Unified Quantum Gravity (QG) Theory of the Universe

The Discussion on calculus is first started with a single question, why small, smaller and smallest distance or units are chosen in calculus?

The answer to this question lies in the fact that higher a length, higher is the uncertainty and smaller is the length higher is the certainty. Suppose, in the following figure a point A moves towards point B through a straight-line AB. Now Point A can move to point B by numerous ways as shown in Figure 1.1

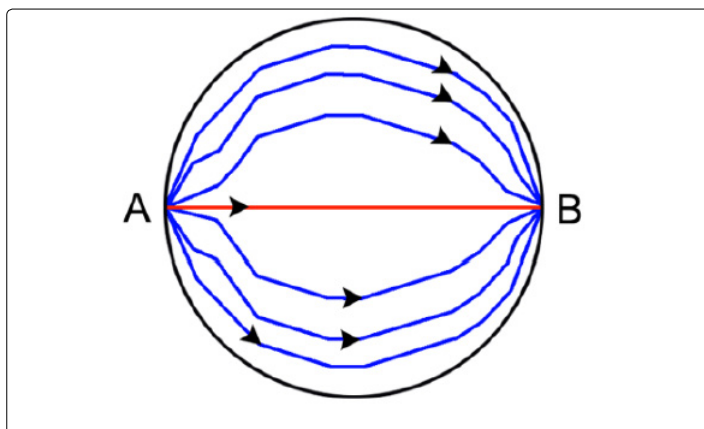


Figure 1.1: Numerous possible ways to reach from point A to B

Now an observer stationed at B will observe that point A is reached at point B. The observer at point B, however, cannot be certain enough that whether point A has reached point B through the straight line AB or other numerous random path as shown in the Fig.1.1. On the contrary if the distance between point A and point B is made closer and closer, the certainty of travel of point A through the straight line AB increases, since the zone of uncertainty decreases as shown in Fig.1.2.

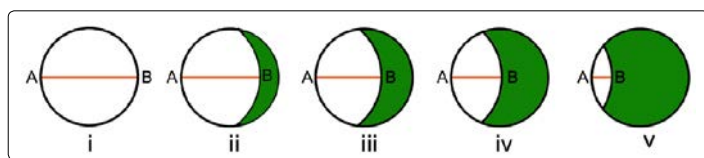


Figure 1.2: Increase of certainty with decrease in distance from point A to B

This is the reason for which, in differential and integral calculus, the smaller units are chosen as building blocks of the physical variables and summation of the small building blocks of the micro domains give the physical variable in the macro domain with least possible uncertainty.

If the longer units are chosen as building blocks of the physical variables, one would land up with results which are erroneous due to the factors of uncertainties.

1.1.1. Building Block Concept of Differential Calculus of the Physical Variables

At the beginning we provide a definition of differential and integral calculus:

Differentiation, explores the actual micro dimensions from the macro dimensionality of the universe by the process of localization or de-hybridization.

Integration is the merging of the micro-dimension of the universe to arrive at a state of macro-dimensionality by the process of hybridization.

We would like to elaborate here that the concept of hybridization (or delocalization) and de-hybridization (or localization). Imagine a square in 2-dimension with the length of each side being 'a'. The square is formed by a process of hybridization through X axis and Y axis as shown in Fig.1.1.1.

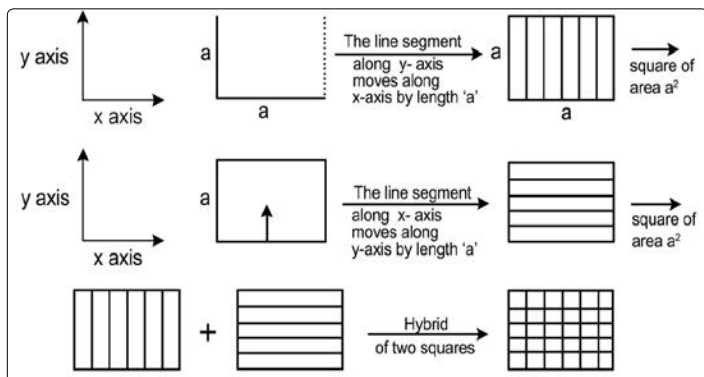


Figure 1.1.1: Hybrid concept of formation of a square

The hybridized state of the movements of the line segment 'a' through X axis and Y axis result in a square as shown in Fig.1.1.1.

So in a square there lie 2 nos. of squares and those are hidden apparently.

The objective of the differential calculus is to find out the smallest building block. The first step to achieve this, is the process of unfolding of the variable as shown in figure below (Fig.1.1.2)

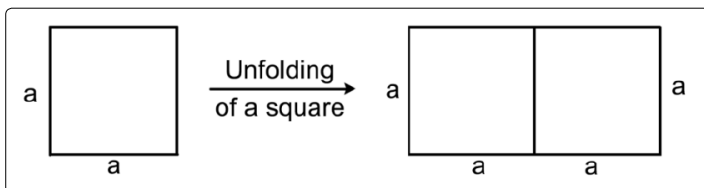


Figure 1.1.2: Unfolding of a square to form two nos. of Squares
This can be considered to be as if, one is given in this hand, a randomly coiled three-dimensional single polymer chain and has been asked to find the length of the each repeating units of the polymer. The first task the person has to do is to fully stretch or unfold the polymer chain, and then attempt for a dimensional collapse of the chain to reach to the repeating units, which are being arranged one after another as shown in figure below (Fig.1.1.3).

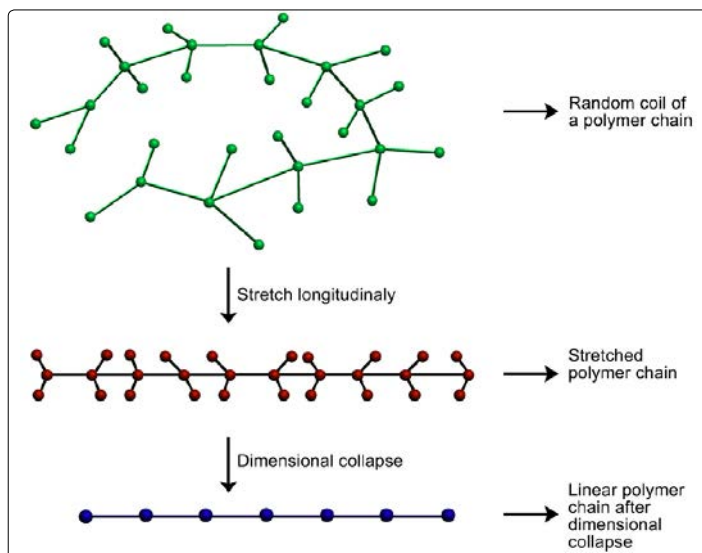


Figure 1.1.3: Stretching and dimensional collapse of a polymer random coil

So the length of the repeating units will be

$$= \frac{\text{(Total length h of the polymer chain)}}{(n-1)}$$

When n is the number of molecules within the length of the chain.

So the case of the square as shown in figure below (Fig.1.1.4) the next step will be a dimensional collapse.

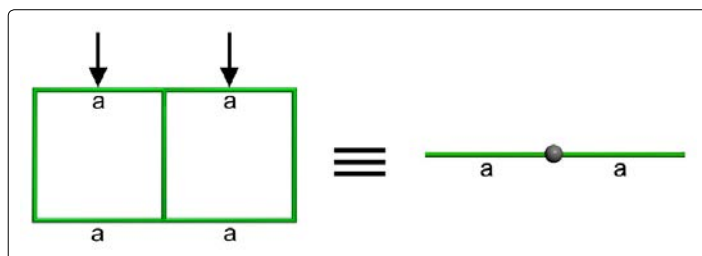


Figure 1.1.4: Dimensional collapse of a square of each side of length 'a'

$$\frac{d}{da}(a^2) = 2a \quad (1.1.1)$$

Now for the line segment a, if it contains n nos. of molecules (or point mass) the shortest distance will be $= \frac{a}{(n-1)}$.

In differential calculus $\frac{d}{da}(a) = 1$ and this 1 signifies the smallest possible intermolecular distance.

A cube is formed by the hybridization of 3 numbers of cubes, one along the x-axis, one along the y-axis and another along the z-axis, as shown in figure 1.1.5. Movement of x-y plane through z-axis forms a cube. Movement of x-z plane through y-axis forms a cube and movement of y-z plane through x axis form a cube.

So, a cube (of length each side = a) contain 3 nos. of cubes. So if a cube is unfolded, we get 3 nos. of cube side by side as shown in figure below (Fig.1.1.5)

Now if each of the cube is dimensionally collapsed we get 3 squares (as shown in Fig.1.1.5). So the sum total area of the dimensionally collapsed 3 nos. of cubes = $3a^2$.

In the language of differential calculus

$$\frac{d}{da}(a^3) = 3a^2 \quad (1.1.2)$$

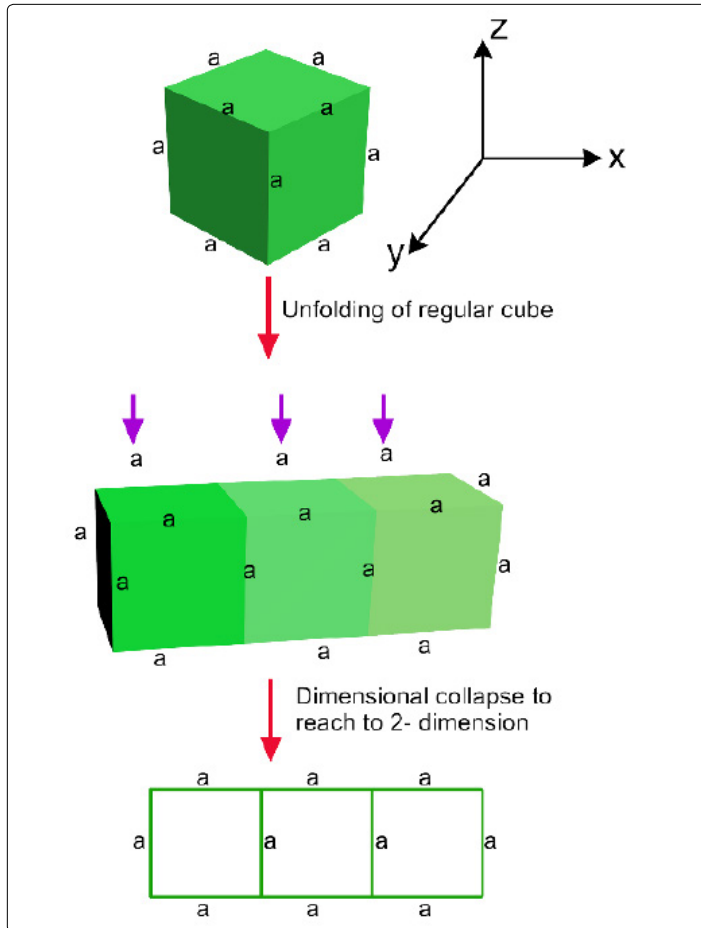


Figure 1.1.5: Dimensional collapse of a cube after unfolding

Now each of the squares is a hybrid of 2 numbers of squares.

So, if these 3 nos. of squares are again unfolded, we get 6 nos. of squares.

Now if each of the square is dimensionally collapsed, we get 6 nos. of line of length a (=6a). So in the language of differential calculus,

$$\frac{d}{da}(3a^2) = 6a \quad (1.1.3)$$

The case of a triangle is very much interesting. A triangle is formed by the hybridization of 3 nos. of translating straight lines of increasing lengths. This means each straight line move along a certain direction and as well its length does increase.

So a triangle (let us take an isosceles triangle for simplicity) is a hybridized form, as shown in figure 1.1.6

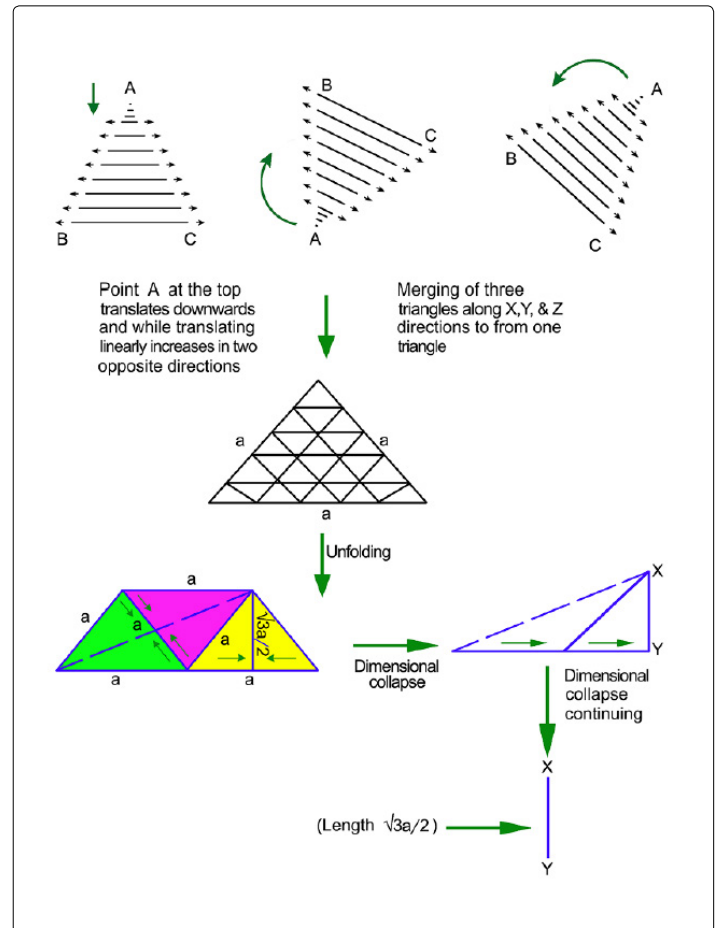


Figure 1.1.6: Formation of triangle and its dimensional collapse (after unfolding) leaving a straight line XY of length $\sqrt{3}a/2$

The area of an isosceles triangle of each side 'a' is $\frac{\sqrt{3}}{4} a^2$ and the derivative is $\frac{\sqrt{3}}{2} a$.

In fact the derivative is the length of the median of the triangle and in figure 1.1.6, it is very clearly shown why the derivative is equal to the length of the median. Upon dimensional collapse of an unfolded triangle, what is left is the median of the triangle only.

The case of a circle is most interesting. In fact along with the differentiation, we get the true dimension of π also.

A circle is formed by the rotation of two nos. line segment in x and y axis respectively as shown in Fig.1.1.7.

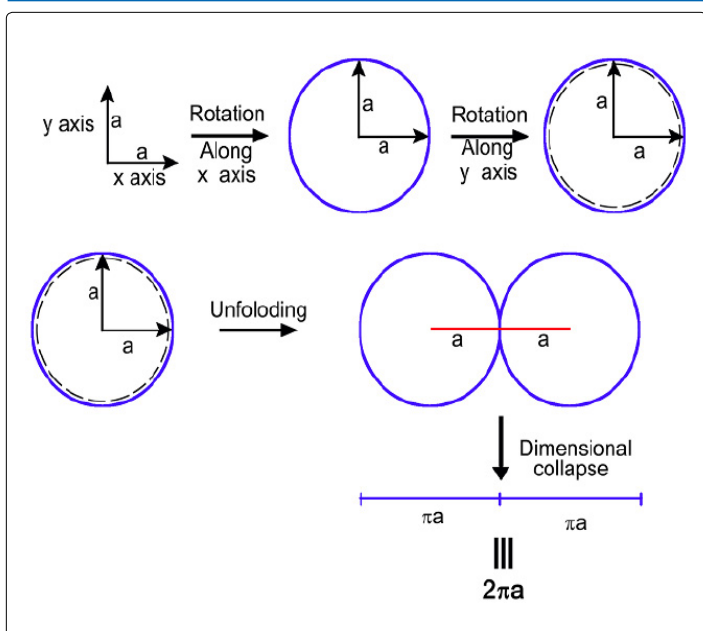


Figure 1.1.7: Formation of a circle, its unfolding & dimensional collapse

So a circle, in fact, contains 2 nos. of circles and once unfolding it, we get two nos. of circles.

The area of a circle with radius a , is πa^2 and its differentiation by definition of calculus is

$$\frac{d}{da} (\pi a^2) = 2\pi a \quad (1.1.4)$$

By unfolding and dimensional collapse, we get the same result as shown above as directly derived from differential calculus.

When we go from 'a' to ' πa ', in fact the average intermolecular distance increases. This is shown in figure 1.1.8.

Now

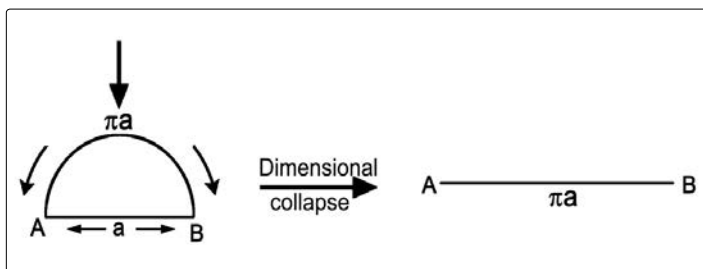


Figure 1.1.8: Dimensional collapse of a half circle

$$\text{Now } \frac{d}{da} (\pi a) = \pi \quad 1.1.5$$

So the intermolecular distance has passed from 1 to π . So actual definition of π is

$$\frac{\text{(Average intermolecular distance at the state of maximum randomness)}}{\text{(Average intermolecular distance in the state of equilibrium)}} = 1.1.6$$

This can be correlated to Lenard Jones potential curve as shown below:

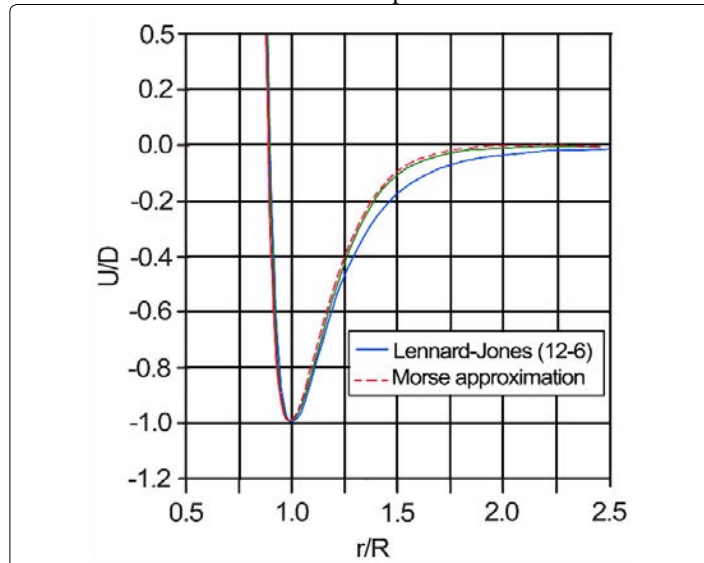


Figure 1.1.9: Representation of Lennard-Jones and Morse Potential

The π value in fact is $\frac{\Gamma_{\text{random}}}{\Gamma_{\text{equilibrium}}}$

For a sphere the case is very interesting. In a sphere of radius, a , there are 3 nos. of spheres of each volume $\frac{4}{3}\pi a^3$. Now if a sphere is collapsed as shown below

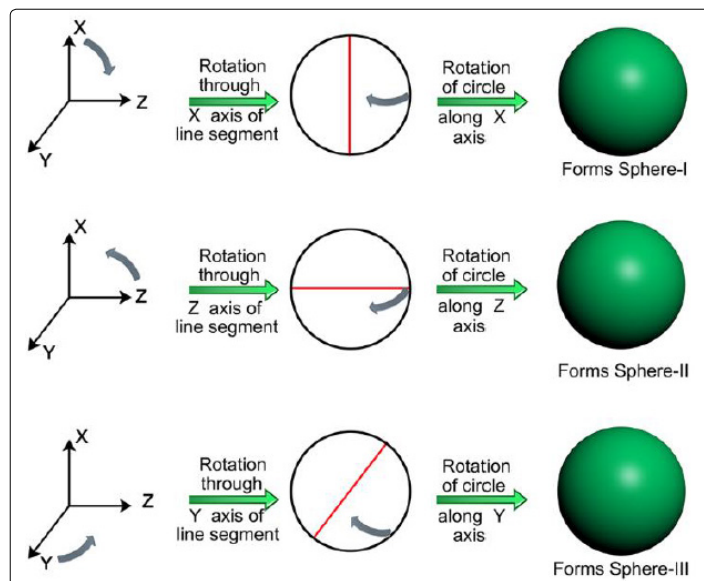


Figure 1.1.10: Formation of a sphere by rotation of line segments & circles along 3 principal directions X, Y & Z

So, for 3 nos. of circles, the total area will be $= 3 \times \frac{4}{3} \pi a^2 = 4\pi a^2$.

(since the total surface area of the sphere is $4\pi a^2$ and each dimensional collapse of the sphere, through either, x-y, y-z or x-z directions would lead to a surface area, which is one third of the original surface area of the sphere)

In the language of differential calculus

$$\frac{d}{da} \left(\frac{4}{3} \pi a^3 \right) = 4\pi a^2 \quad (1.1.7)$$

Now $4\pi a^2$ means 8 nos. of circles, (since one circle contains 2 nos of circles). So total area will be = $8\pi a^2$, Figure 1.1.11 and 1.1.12

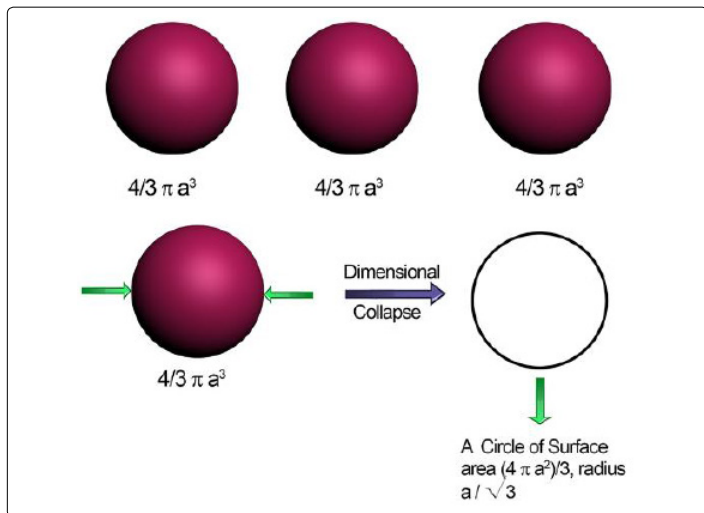


Figure 1.1.11: Dimensional Collapse of a sphere

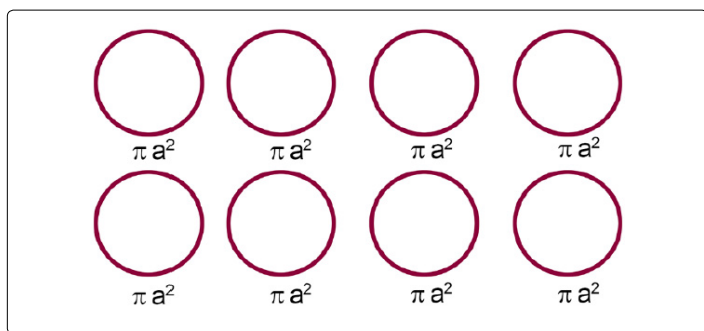


Figure 1.1.12: Existence of 8 Nos. Circles (πa^2) in $4 \pi a^2$

Now if all the above 8 nos. of circles are dimensionally collapsed, each will offer a length $2\pi a$. So the total length will be $16\pi a$.

In the language of differential calculus

$$\frac{d}{da} (8\pi a^2) = 16\pi a \quad (1.1.8)$$

Now in integral calculus, when we integrate a variable say a.

$$\int a \, da = \frac{a^2}{2} + k \quad (\text{constant of integration})$$

Let us examine the significance of this constant of integration.

When we go for dimensional collapse, say from 2-dimensions, it goes to 1 dimension. After these collapses all the molecules are bound to confine themselves in 1-dimension. Even not a single molecule can pass on to 2-dimension. But in the case of integration,

say on passing from 1 to 2-dimensions, the molecules can move a part or fully cover the 2-dimension or even can move beyond the stipulated limit (obviously in 2 dimensions only) as shown below in Fig.1.1.13.

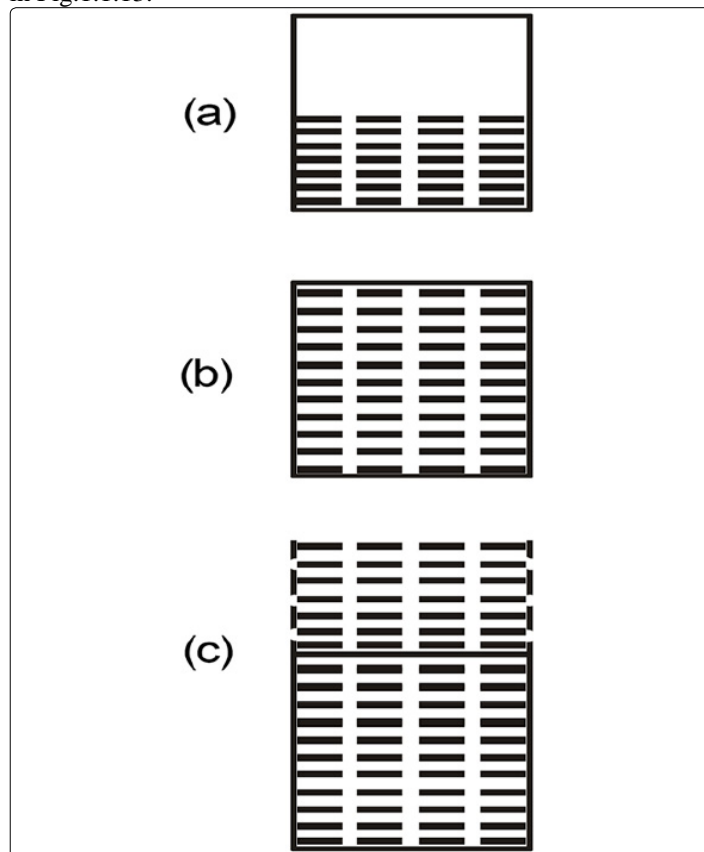


Figure 1.1.13: Integrations and their domains limits

In case of a, the molecules move purely in 2- dimensions but below a stipulated limit, so the value of $k = -ve$. In case of b, the molecules fully cover the stipulated area and so $k = 0$. In case of c, the molecules moves beyond the stipulated area limit and in fact can go up to infinity, so (but all the movements are in 2 dimension only) $k = +ve$.

This is the actual reason why a constant of integration is always associated in a mathematical integration or integral calculus.

Now let us examine the derivatives of the trigonometric ratios i.e., $\sin\theta$, $\cos\theta$, $\sec\theta$, $\csc\theta$, $\tan\theta$ and $\cot\theta$. This is also evolved from the theory of dimensional collapse.

1.2. Analysis of Fundamental Definition of Differential Calculus

When we talk about the differential coefficient of a function y with respect to x , it is expressed as $\frac{dy}{dx}$. Now $\frac{dy}{dx}$ is usually considered to be an index of rate of change of the y function, when the increment of the variable x i.e., Δx is vanishingly small. But $\frac{dy}{dx}$ also represents the building blocks of the function y as well. This statement is the same as that of saying that the derivative of the function y , $\left(\frac{dy}{dx}\right)$,

gives rise to another function (say z). Then by varying this z function one can bring the changes in the original function y. We know that for a function

$$y = x^n \quad (1.2.1)$$

$$\frac{dy}{dx} = n x^{n-1} \quad (1.2.2)$$

$$\text{If, } y = x^3 \text{ then } \frac{dy}{dx} = 3x^2 \quad (1.2.3)$$

Another way of expressing this building block concept is, by changing the magnitude (decreasing or increasing) of x^2 , one can bring a change in the value of the function x^3 .

Differential coefficient of any function y with respect to x ($\frac{dy}{dx} = z$)

have the following three significances and all converge to the same point.

Z expresses rate of change of y with respect to change in x.

Z is the building block of the function y.

By changing the function z one can bring a change in the function y.

For trigonometric function $\sin\theta$, it is known that

$$\frac{d}{d\theta}(\sin\theta) = \cos\theta. \quad (1.2.4)$$

This means that by $\cos\theta$ function, one can bring a change in the function $\sin\theta$. It is the function $\cos\theta$, from which a $\sin\theta$ function is evolved as in the case of a cube, x^3 , originating from three square planes ($3x^2$). Also to note that $\cos\theta$ is the building block of $\sin\theta$.

In the above example, 3 numbers of square plane are hybridized in 3-dimension to form a cube. When the cube is de-hybridized, we get back the hybridized building block units. So x^3 is the hybridized (or integrated) form of $3x^2$. On the other hand $3x^2$ is the differential coefficient or de-hybridized form of x^3 .

So integration is a hybridizing phenomenon and differentiation is de-hybridizing phenomena.

The objective of differential calculus is 2 fold as stated below:

1. To find out the smallest possible value of any variable of the universe
2. To find out the actual dimensionality of a function (for example x^n is made of n nos. of x^{n-1} dimensions and since the derivative of x^{n-1} is $(n-1)x^{n-2}$, so x^{n-1} in turn is made of $(n-1)$ nos. of x^{n-1} dimensions).

The mathematical formula of Sir Isaac Newton for calculating the differential co-efficient of a function in the following form needs some conceptual explanation

$$\frac{d}{dx}[f(x)] = f'(x) = \text{Lt}_{h \rightarrow 0} \left[\frac{f(x+h) - f(x)}{h} \right] \quad (1.2.5)$$

Where $f(x)$ is the function of the variable x, $f'(x)$ is its derivative or differential co-efficient. The factor h stands for the increment in the value of the variable x and that is Δx .

The $f(x+h)$ in the numerator of the above equation 1.2.5 does represent an unfolding or expansion of the function by taking the value of the variable x from x to $(x+\Delta x)$ or $(x+h)$. When the $f(x)$ is being subtracted from $f(x+h)$, one is left with the expanded incremented or unfolded part only, and the original function does no more remain in it.

Dividing $[f(x+h)-f(x)]$ by h is an operation which is actually a dimensional collapse such that the underlying dimensions, which were not apparently visible in the function $f(x)$, becomes visible. For example when we collapse a cube dimensionally we are left with square plane.

At this stage, one should take the value of expanding factor h lower and lower such that when $h \rightarrow 0$ and under the circumstances, we get the least possible value of the variable, as for example a lowest possible area (x^2) of a square plane in the above said case of a cube, x^3 .

In the first dimensional collapse, one gets the macro-scale dimensions and upon further collapsing i.e. the second derivative of the function $f(x)$, the micro-scale dimensions are obtained. In this way as one finds out the higher derivative of the function, say, 3rd, 4th, 5th, 6th... the more and more micro-dimensionality are obtained.

In this article, we have already shown that how the derivatives of different functions (a straight line, a square, a cube, a circle, a sphere) are evolved from step-wise operations as stated below.

Unfold the function first

Dimensional collapse

In Newton's equation, the value of h is not required to be very small at the beginning. One can unfold the function as maximum possible and then collapse the dimensions by the same magnitude, to understand the underlying-dimensions and finally make this collapsing factor, vanishingly small to find-out the least possible value of the said underlying dimension.

1.3 Derivatives of Trigonometric Functions, Logarithm and Exponential Function e^x

Now we will analyze how the derivatives of the trigonometric functions are obtained. In figure 1.3.1A, the hypotenuse YZ (=H) slowly falls on the perpendicular, so one is left with a perpendicular YX only (=P). Now as we create the points B1, B2, B3... along the straight line perpendicular to XY from point X, the Base B(=XZ) is generated and the hypotenuse YZ is also generated. So by creating a function ($B/H = \cos\theta$), we generate another function that is

$$\sin\theta = \frac{P}{H} \text{ (Fig.1.3.1.A)}$$

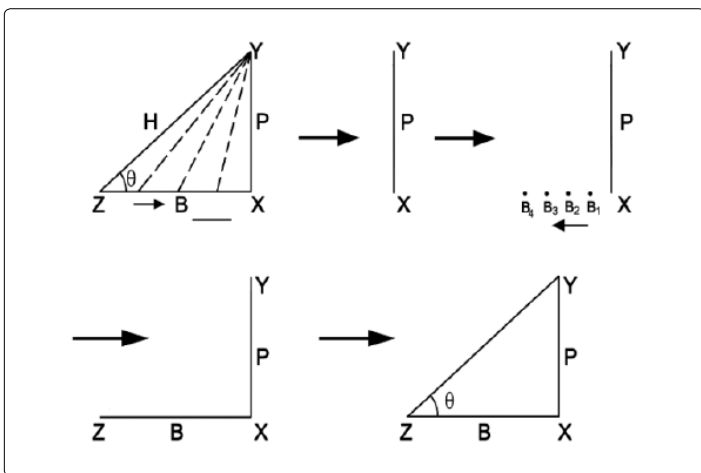


Figure 1.3.1.A: Formation of Sin (θ) Function from Cos (θ) function

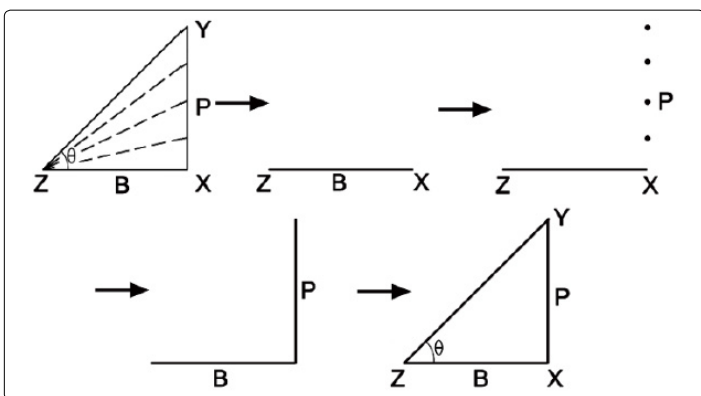


Figure 1.3.1.B: Formation of Cos (θ) Function from Sin (θ) function

If a trigonometric function is expressed as (a/b), then to find out the derivative of this said trigonometric function one has to look for a trigonometric function, which should be in the form, for example, (c/b) and is the building block of the function (a/b).

$$\sin\theta = \frac{P}{H}, \frac{d}{d\theta}(\sin\theta) = \cos\theta \quad (1.3.1)$$

In case of $\sin\theta$, the length of the hypotenuse, H , remains constant and the decrease in Base length = increase in perpendicular length and as a result $\theta' > \theta$ (Figs.1.3.2).

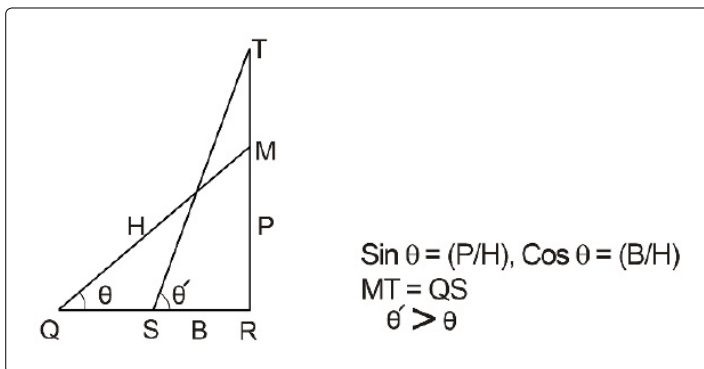


Figure 1.3.2: Derivative of Sin and Cos θ

So the change in (P/H) ratio is being controlled by (B/H) ratio.

$$\text{So, } \frac{d}{d\theta}(\sin\theta) = \frac{B}{H} = \cos\theta \text{ [P increasing with increasing } \theta].$$

In case of $\cos\theta$, H remains constant as the case for $\sin\theta$, but here the base length decreases with increase in θ . (P/H) ratio controls the value of $\cos\theta$

$$\text{so, } \frac{d}{d\theta}(-\cos\theta) = \frac{P}{H} = \sin\theta$$

$$\text{or, } \frac{d}{d\theta}(-\cos\theta) = \sin\theta \quad (1.3.2)$$

$$\text{or, } \frac{d}{d\theta}(\cos\theta) = -\sin\theta. \quad (1.3.3)$$

$$\tan\theta = \frac{P}{B}, \frac{d}{d\theta}(\tan\theta) = \sec^2\theta \quad (1.3.4)$$

Here, as shown in Figure 1.3.3, the change in (P/B) ratio is controlled out by two ways, i.e.

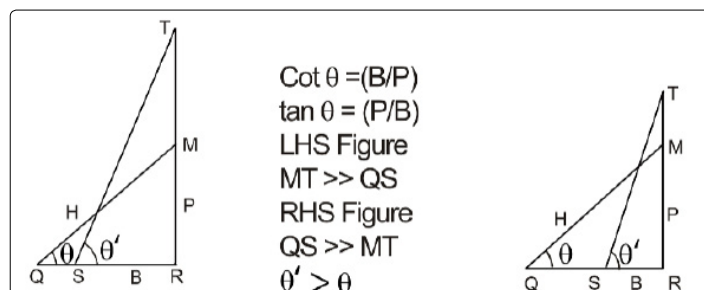


Figure 1.3.3: Derivative of $\tan\theta$ and $\cot\theta$

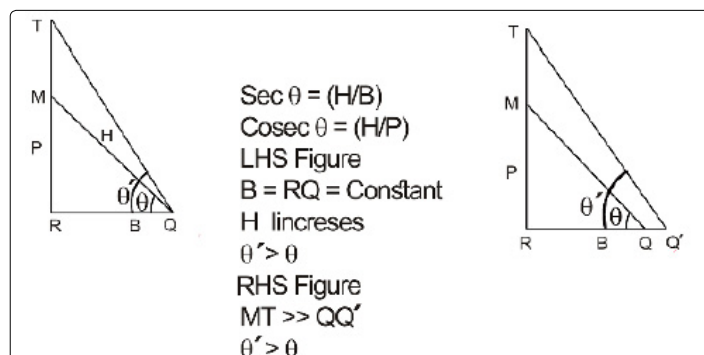


Figure 1.3.4: Derivative of $\text{Cosec}\theta$ and $\text{Sec}\theta$

Increase of the length of $P \gg$ decrease in length of B .
Decrease in the length of $B \gg$ increase in length of P .

The net result of the combined effect of both the cases as stated above, is the change in the value of H and θ increases. So $\frac{d}{d\theta}(\tan\theta)$ (follow figure 1.3.3) becomes a hybrid of two numbers of (H/B) ratio since in both cases B diminishes, P increases

$$\frac{d}{d\theta}(\tan\theta) = \left(-\frac{H}{B}\right) \times \left(-\frac{H}{B}\right) = \frac{H^2}{B^2} = \sec^2\theta \quad (1.3.5)$$

$$\operatorname{cosec}\theta = -\frac{H}{P}, \quad \frac{d}{d\theta}(\operatorname{cosec}\theta) = -\operatorname{cosec}\theta \cot\theta \quad (1.3.6)$$

In this case also the length of equilibrium, H increases and θ also increase. This can be done by (follow figure 1.3.4)

i) Increase P as required independently such that H increases (B constant)

ii) Decrease the value of B but increase the value of P in such a level such that over all H increases.

So,

$$\frac{d}{d\theta}(\operatorname{cosec}\theta) = \frac{H}{P} \times \frac{-B}{P} = -\operatorname{cosec}\theta \cot\theta \quad (1.3.7)$$

$$\sec\theta = H/B, \quad \frac{d}{d\theta}(\sec\theta) = \sec\theta \tan\theta \quad (1.3.8)$$

In case of $\sec\theta$, the two cases with increasing θ and increasing, H, are (Fig. 1.3.4)

i) Independently go on increasing the length of P (B remains constant)

Make small increase in length of B and relatively higher increases of length P such that the overall effect is the increase of H

So,

$$\frac{d}{d\theta}(\sec\theta) = \frac{H}{B} \times \frac{P}{B} = \sec\theta \tan\theta \quad (1.3.9)$$

$$\cot\theta = \frac{B}{P}, \quad \frac{d}{d\theta}(\cot\theta) = -\operatorname{cosec}^2\theta \quad (1.3.10)$$

In this case also there are two numbers of possibilities (Figure 1.3.3)
Increase in length of P >> decrease in length of B

Decrease in the length of B >> increase in the length of P

In both the above cases, θ increases and $\frac{d}{d\theta}(-\cot\theta)$ (since B is diminishing in both cases), becomes a hybrid of two numbers of H/P ratios.

So,

$$\frac{d}{d\theta}(-\cot\theta) = \frac{H}{P} \times \frac{H}{P} = \operatorname{cosec}^2\theta \quad (1.3.11)$$

$$\frac{d}{d\theta}(\cot\theta) = -\operatorname{cosec}^2\theta \quad (1.3.12)$$

Why $d/dx(\log x) = 1/x$

The logarithm of x or log of a variable x is the form of representation of the variable in power or exponent form. Higher be the value of this index or power is, higher is the value of the variable or the variable is in larger or in more random form.

In logarithm, the usual practice is to express any variable in the form of, to the power of a selected base, say for example 10. Now, if we choose a variable 100, it will take the form 10^2 . Now 2 is called the logarithm of 100 with base 10.

In case of 1000, it will be 10^3 and the logarithm of 1000 will be 3. So this way, 2, 3, 4, 5... will be the logarithm of 100, 1000, 10000, 100000 ... etc. respectively.

100 in log scale with base 10 is represented by 2. So as if the 100 units are made smaller and packed in 2 units, such that the value of each unit becomes, $(2/100) = 0.02$. Now under this condition, if 2 is being dimensionally or by size collapsed to unity or 1 (factor of division, 2), then each of the small units (0.02) would also be diminished by the same factor 2 and will attain the value of $(0.02/2) = 0.01$.

The inverse of the variable x (here $x = 100$) is $(1/x)$ and 0.01 (as obtained above) is $(1/100)$ and so the derivative of $\log x$ or $\log 100$ is $(1/100) = 0.01$.

If $x = 10000(10^4)$, then its logarithm is 4. So 10000 units have been made smaller, such that it just gets packed in 4 units. So each small units attain a value of $(4/10000) = 0.0004$. Now if 4 is dimensionally collapsed to 1, then each smaller units will be reduced to $(0.0004/4) = 0.0001$

So, 0.0001 are the building blocks of 4 and hence $d/dx(\log x) = (0.0001) = (1/x)$.

Concept of e^x

As has been shown earlier that the parameter π is originated from the kinetic energy of randomness of the molecules, the universal constant e is originated from the potential energy (molecular attractive forces) part.

Suppose there are infinite nos. of equidistant points, $A_1, A_2, A_3, A_4, \dots, A_\infty$, on a straight line as shown in Figure 1.3.5 and the each intermolecular distance is say 1.

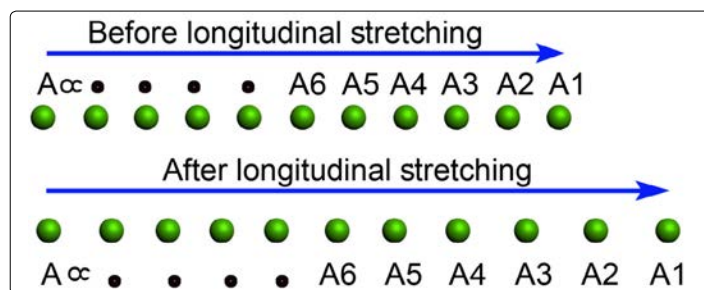


Figure 1.3.5: Representation of Stretching of a Molecular length segment

Now if the point A_1 is stretched by a length x, the point A_2 will be less stretched than A_1 . A_3 will be less stretched than A_2 and this will continue like this. This effect will continue up to infinite distance, so the line segment will look like (Fig. 1.3.5)

$$\text{So, } e = (1 + 1/n)^\infty, \quad \text{When } n \rightarrow \infty \quad (1.3.13)$$

$$\text{So, } e^x = (1 + x/n)^\infty, \quad \text{When } n \rightarrow \infty \quad (1.3.14)$$

If any terminal point is stretched by 1 unit, its effect will continue up to infinity and the increased length is, e . Now the point to note here that, the relative deformation or displacement of any point $A_1, A_2, A_3, A_4, \dots$ is dependent on its position from the end.

If the point A is stretched by two units, the sum total effect will be e^2 . If the point is stretched by x units.

Then the sum total effect will be e^x ..

This is actually what is called an exponential growth. This can be represented mathematically by a power series

$$e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \dots \quad (1.3.15)$$

Though a single unit is stretched by 1 unit, but the total increase of the length up to infinite distance will be $2.7172\dots$, that is the value of e .

If a single unit is stretched by 2 units the total increase of the length up to infinite distance will be e^2 . If a single unit stretches by x units the total increase of the length up to infinity will be e^x or $(2.717222\dots)^x$. In fact, e^x is a hybrid of growth and de-growth. If we consider A_∞ to point A_1 in Figure 1.3.5, there is an exponential increase in length.

But if we consider the point A_1 to point A_∞ there is an exponential de-growth in the length. So from one end it is increasing and from another end it is decreasing.

Also very interestingly, the function e^x is already in a fully stretched differential form or de-hybridized form. So differentiating such a stretched function does not carry any sense. Speaking in other way, differentiating such a function will always lead to the retention of the same function. Differential calculus takes a function from a hybridized (integrated) state to a de-hybridized state (differential

$\frac{d}{dx}(e^x) = e^x$ state) and determines the underlying dimensions and since the e function is already a de-hybridized one, so it cannot be differentiated further.

So e^x since the rate of growth and rate of de-growth cancels each other, so the function does not change its form on differentiating.

Concept of Hybridization and Dehybridization

Multiplication in fact is a hybridization process. When we multiply say a variable x , with another variable, y it results xy , the value of the product. Then xy becomes the full domain and x persists over the entire domain xy and y also persists over the entire domain xy . See the figure below (Fig.2.1)

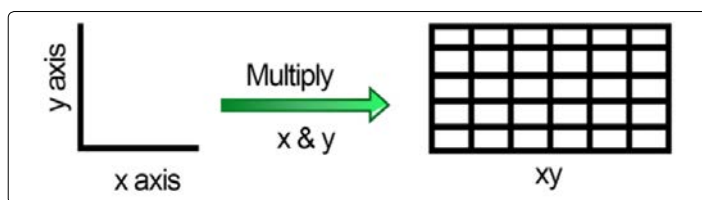
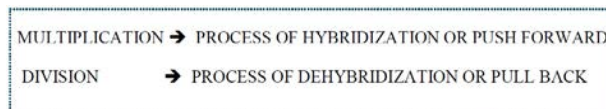


Figure 2.1: Hybrid representation of Multiplication

This is in fact an intermolecular mixing process. When we add salt into water to form a homogeneous solution, then the solution is the hybridized state of salt molecules and water molecules. This can also be interpreted as salt pushes forward water into a new phase (solution) and water pushes forward salt into a new phase. So multiplication is also a push forward process.

Division on the contrary is a de-hybridization process. Say we divide xy by x , the result is y . x de-hybridizes the state xy and separates the molecule of x from the molecules of y . Also it can be called as pull back. When xy is divided by x , x pulls back itself from xy and leaves y alone. So to sum-up



Now, the parameter pressure (P) needs to be understood very well. In any matter of the universe among the molecules push forward forces (repulsive forces) and pull back forces (intermolecular attractive forces) are operating. Pressure of a substance is the hybrid of the “PUSH FORWARD FORCE” and the “PULL BACK FORCE”. This can also be called as the hybrid of kinetic (push forward) force and the potential (pull back) force. Such that the Pressure (P) can be written as

$$P = \text{Push forward force (PFF)} \times \text{Pull back force (PBF)} \quad (2.1)$$

When a substance is under equilibrium with the surroundings, this pressure, P is equal to unity. So P (equilibrium with the surroundings) = PFF \times PBF = 1.00 (2.2)

Now under non equilibrium condition

$P = \text{PFF} \times \text{PBF}$ can be either greater than 1 or less than 1.

If $P < 1$, then the substance, if being left on its own, starts contracting until or unless P becomes 1 and equilibrium is again attained.

If $P > 1$, the substance starts expanding until and unless P becomes 1 and equilibrium is re-established.

We often in science deal with “Randomness” and “Order” parameter of the matter/substances of the universe.

The actual definition of randomness is the homogenization of the push forward forces (directional force) generated among the

molecules over the entire volume (V), by the multi-directional movement of the molecules (Fig.2.2).

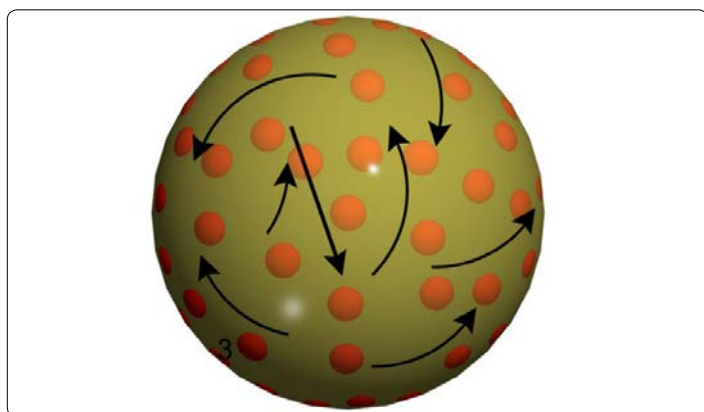


Figure 2.2: Development of Randomness

Orderliness is the result of localization (inversion) of any directional force or pull back force, generated in a system owing to the presence of intermolecular attractive forces.

So the energy of a system is a hybrid of
 PUSH FORWARD FORCE
 PULL BACK FORCE
 VOLUME

And this needs to be considered for all the 3 principal axis x, y and z respectively.

So energy over x- direction

$$= PFF \times PBF \times V = PV$$

So the energy over all the 3 directions will be the sum of PV for the 3 directions such that

$$E = \sum PV = 3V$$

In case of a system the equilibrium with the surroundings, the energy, E (when P = 1)

$$E = 3V$$

Now we will analyze the following issues one after another --

What is the origin of the parameter π ?

What are the significances of the positive and the negative variables?

Why the product of a positive variable and a negative variable is always negative?

Why the product of a negative variable with another negative variable is always positive?

What does it conceptually mean $x, x^2, x^3, \dots, x_\infty$ of a variable?

What does it conceptually mean $x, x^{1/2}, x^{1/4}, x^{1/8}, x^{1/16}$ of a variable?

What are the significances of Zero and Infinity?

How the numbers 0, 1, 2, 3, 4, 5... ∞ their inverses and negatives can be interpreted as the volume- energy Universal Diagram?

What is the inverse of a variables?

What are the physical conception behind considering $x/\infty = 0, x/0 = \infty, x^0 = 1, \infty/\infty$ being undefined?

What is actually imaginary number is?

All the above is being explained below by bridging the concepts of Physics, Mathematics, Geometry

2.1 Proper Understanding of the π -parameter

To understand the parameter π , one needs to evaluate the origin of the development of curvature in the matters of the universe.

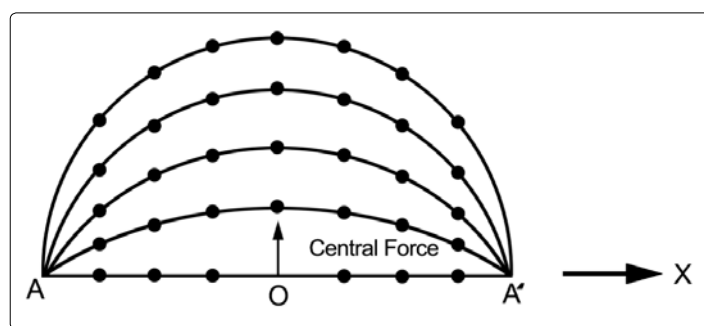


Figure 2.1.1: Origin of curvature in a liner line AA', the midpoint is 'O'

When a push forward force is generated from a central point O as shown in above figure (Fig.2.1.1) of a straight line containing equidistant molecules, the displacement of the terminal points A and A' will be zero. The larger is the distance of a point from the centre molecule O, the lesser would be the displacement. The closer the point or a molecule is to the point O, the larger would be the displacement along the y direction. As the magnitude of the force increases, larger would be the displacement of the molecules along the y direction and this way a curvature is created and the average intermolecular distances also do increase. There is a limit of the maximum curvature one can obtain for a fixed length of the line segment AA'. More simply it can be represented as in figure 2.1.2

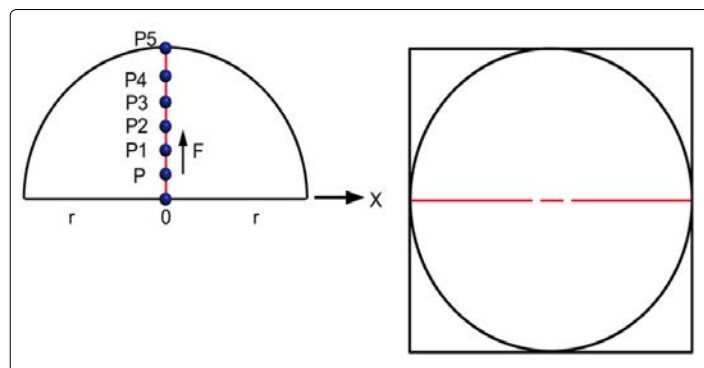


Figure 2.1.2: Change of curvature with increase in central force, F and evolution of π parameter in 2- dimension

So displacement of a point O along Y-direction,

$$Y \propto \frac{1}{2r} \quad (2.1.1)$$

The segment r contains certain number of molecules, so the displacement along Y direction is inversely proportional to the length r. Higher the length r, it will contain more numbers of molecules and the pullback forces will be higher

$$\text{So } Y \propto \frac{1}{2r} \quad (2.1.2)$$

Now higher the energy of the system, (energy = force x displacement), higher would be the magnitude of Y. Now

$$Y \text{ is } \propto \text{energy of the system.} \quad (2.1.2)$$

$$\text{So, } Y \propto \frac{\text{energy of the system}}{2r} \quad (\text{Combining Eqs.2.1.1 and 2.1.2})$$

$$\text{So, } Y = k \times \frac{\text{energy of the system}}{2r} \quad (2.1.3)$$

Now k = constant, for a fixed value of r and for each and every value of Y, there exists a value of k.

Now when the displacement Y = r (maximum possible displacement), the value of the constant k, reaches to its optimum maximum value.

$$r = k \times \frac{\text{energy of the system}}{2r} \quad (2.1.4)$$

$$k = \frac{2r^2}{\text{energy of the system}} \quad (2.1.5)$$

$$\text{or, } \frac{1}{k} = \frac{\text{energy of the system}}{2r^2} \quad (2.1.6)$$

Now this 1/k is actually what the π -parameter is, for 2-dimension. We will show later that the 2- dimensional energy of a system = $2\pi r^2$.

In the case of 3-dimension the following figure (Fig.2.1.3) can be referred.

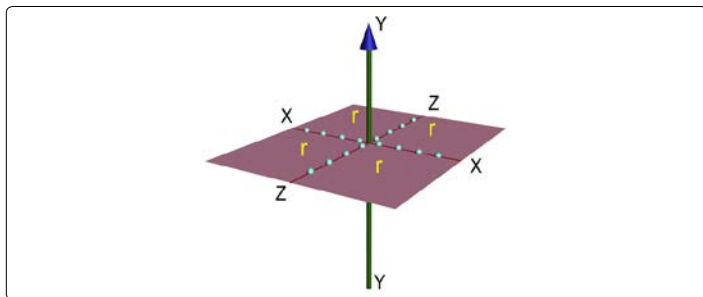


Figure 2.1.3: Evolution of π in 3-dimension

Now in accordance with Fig. 2.1.3, displacement along Y direction,

$$Y \propto \frac{1}{2r} \quad (\text{for x direction}) \quad (2.1.7)$$

$$Y \propto \frac{1}{2r} \quad (\text{for z direction}) \quad (2.1.8)$$

$$Y \propto \text{Force x displacement} \quad (2.1.9)$$

$$\propto \text{Energy of the system} \quad (2.1.10)$$

$$y \propto \frac{\text{energy of the system}}{4r^2} \quad (2.1.11)$$

$$\frac{yx4r^2}{\text{energy}} = \text{constant} \quad (2.1.12)$$

Now for the maximum possible displacement Y = r

$$\frac{rx4r^2}{\text{energy}} = \text{constant} = k \quad (2.1.13)$$

$$\text{Now, } k = \frac{4r^3}{\text{energy of the system}} \quad (2.1.14)$$

$$\text{Or, } \frac{1}{k} = \frac{\text{energy of the system}}{4r^3} = \pi \quad (2.1.15)$$

Now we will show later that the energy of a system = $4\pi r^3$ for 3-dimension.

In Eqn.1.1.6, r is the average intermolecular distance at the equilibrium state, when the intermolecular potential energy is, minimum. Now the energy of the system in the numerator of the above equation is directly proportional to the maximum limiting value of the average intermolecular distance, (r_m), the intermolecular distance at which the intermolecular potential reaches the maximum limiting value.

$$\pi = \frac{(\text{limiting value of the intermolecular potential of the random state})}{(\text{Limiting value of the intermolecular potential at the equilibrium state})}$$

$$= \frac{(\text{Limiting value of the average intermolecular distance of the disordered state, } r_m)}{(\text{Limiting value of the average intermolecular distance at the equilibrium state } r_{eq})} = \frac{r_m}{r_{eq}}$$

The Lenard Jones intermolecular potential [1,2] curves is being shown in Fig.1.1.9 [reprinted from “The relationship between Lenard Jones (12-6)... Morse Potential” Natureforsch 58a, 615-617 (2003) with permission], it is clearly found that the ratio of r_m to r_{eq} (in figure 1.1.9) is equal to about 3.145...].

The ratio of the distance r/R from 1 to 2.5 (6 nos. of unit square) and the distance from .5 to 1 (2 nos. of unit square) or the minimum and the plateau region in Fig. 1.1.9, corresponds to numeric value of 3. How this value of 3 acquires ultimately non-converging value 3.145... has been explained later. The π -value is hidden in the Lenard Jones potential curve itself and which was not being scrutinized or noticed earlier. So the universal parameter π is being established as a pure thermodynamic parameter originating from the inter-molecular attractive and repulsive forces and is a ratio of the lengths, related to the intermolecular attractive and repulsive forces.

$$\pi = \frac{\text{(average intermolecular distance when the curvature attains its maximum value), } r_c}{\text{average intermolecular distance when the matter is in the linear shape, } r_L}$$

$$= \frac{r_c}{r_L} = \frac{r_{\text{random}}}{r_{\text{equilibrium}}} \quad (2.1.17)$$

π is basically an expansion factor which brings non-linearity in linear matters.

2.2. Concept of Positive and Negative Physical Variables, their Inverses and the Concept of Zero, Infinity, Square and Square Roots of the Physical Variables

A negative and a positive variable in fact stand in just opposite to their direction of change. Let us consider the case of two variables, x and $-x$. The magnitude of both the variable are the same and the magnitude is x . While $+x$ is under growth, the variable $-x$ is under contraction.

When we multiply a positive variable with a negative variable, the product is considered negative. For example $(-3) \times (+5) = (-15)$. This also comes from the hybridization concept, and expansion and contraction phenomena too.

Here as (-3) and $(+5)$ hybridizes as shown in Fig.2.2.1. (-3) is contracting and $(+5)$ is expanding until and when the hybridized state (-15) is attained. Since one is in contracting mode and the other is in an expanding mode and the process of hybridization can never take place under such a situation. They can only hybridize if the hybridized state is contracting type. One has to make the hybridize state a contracting one, only then the process of hybridization is successful. On the contrary if the hybridized state is made expanding type, proper inter-mixing of the molecule or the homogenization process will never take place. So one has to make pressure, $P < 1$ to make the inter-mixing, a possible phenomenon.

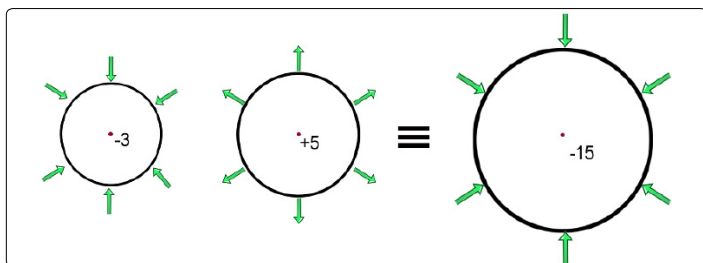


Figure 2.2.1: Multiplication of a positive & a negative variable

When we multiply two positive variable for example A and B, both the variable are expanding type and the hybridize state is more dissociative type and this makes, $P > 1$. As a result the product of two positive variables is always a positive one.

When we multiply two negative variable A and B, the case is totally different. In the said case both the variable are contracting type and hence the intermolecular attractive or pull- back forces are very high. During the hybridization process the molecules comes so close to each other and due to the synergistic effect of both being contracting type a strong repulsive force is originated and makes

the hybridized state much more dissociative one, and as a result the value of P becomes > 1 (Fig. 2.2.2) below.

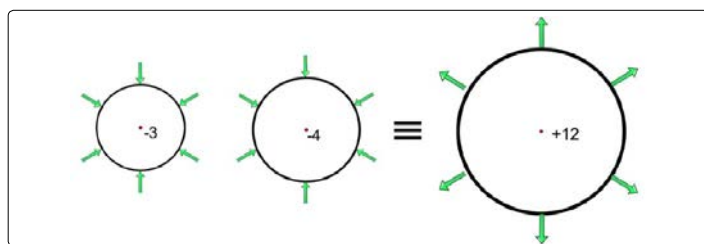


Figure 2.2.2: Multiplication of two negative variables

This is the reason why the product of two negative variables is always positive and expanding type. This might also be signified as ‘back-up’ pressure exerted by the molecules in close proximity to each other.

Concept of $x, x^2, x^3, x^4, \dots, x^\infty$

Whenever one deal with a variable say, x . What does $2x$ mean?

Suppose we are talking about a ‘mass’. So 2 numbers of masses mean, that 2 same masses are separately existing. If one says a $(\text{mass})^2$, this means the co-existence of 2 nos. of masses in one mass. So in $(\text{mass})^2$, the number of mass units are just the double than in a single mass. This mass will naturally be of more strength and compact than a single mass or two numbers of masses.

This way if we go on considering $(\text{mass})^3, (\text{mass})^4, (\text{mass})^5 \dots$ in the dimension of a single mass 3, 4, 5, 6, 7, 8... ∞ no’s of masses would exist.

The consequence of this is, to remain in the same volume (so many nos. of molecules), each molecule start decreasing in their average size. As a result during contraction of molecule, strong, stronger and strongest attractive or pullback forces are generated. This results in contraction of the entire volume and release of high amount of energy. This decrease in volume continues as one passes from $x, x^2, x^3, x^4, \dots, x^\infty$. In this way ultimately the dimension becomes very small. This is what is called the concept of ‘Black-Hole’ formation (Fig.2.2.3 as shown below).

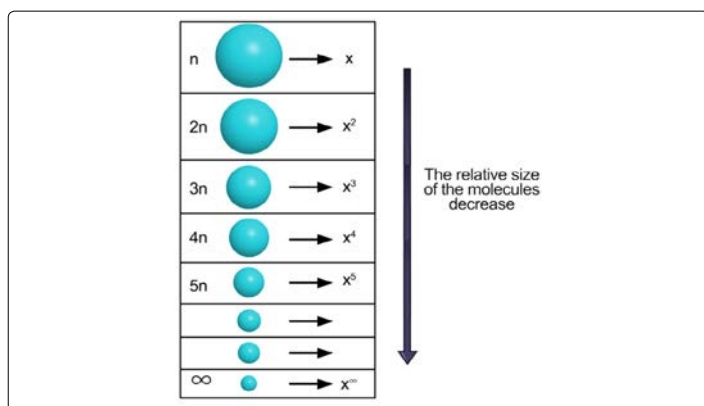


Figure 2.2.3: Squaring of a hybrid concept ($n, 2n, 3n \dots$ no of molecules /unit volume)

The relative size of the molecules, fall as we pass from x to x^2 to x^3 to $x^4 \dots x^5, \dots x^\infty$.

So the theory of relativity Albert Einstein would be more valid in the relative sizes of the molecules depending on the state of hybridization of the variable is $x, x^2, x^3, \dots x^\infty$. The following diagram may be followed in this context. If the number of molecules is n in the variable X ,

So squaring, cubing, of a variable like mass is basically a process of contraction.

On the contrary $x, x^{1/2}, x^{1/3}, x^{1/4} \dots$ would follow a reverse diagram as shown in Fig.2.2.4.

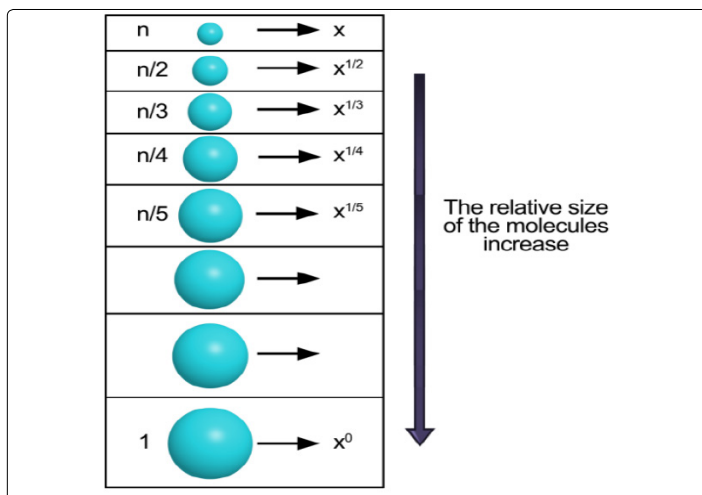


Figure 2.2.4: Hybrid concept of squaring rooting, cube rooting of a variable ($n, n/2, n/3 \dots$ no of molecules /volume)

So square rooting, cube rooting means expansion of the variable. Unlike the concept of Black-Hole formation it is the concept of formation of ‘White-Hole’. The intermolecular attractive forces diminish, diminish and diminish. So at the end $x, x^{1/2}, x^{1/3}, x^{1/4} \dots x^0$, only a single molecule is left out. This is the reason why we say x^0 or (anything)⁰ is 1. Since we are left with a single molecule virtually. In this case also one may think the theory of relativity is operative in the relative size of the molecules depending on the state of de-hybridization.

So summing up

$x, x^2, x^3, \dots x^\infty \rightarrow$ Process of hybridization or a process of contraction

$x, x^{1/2}, x^{1/3} \dots x^0 \rightarrow$ Process of de-hybridization or expansion.

Concept of zero and infinity

Zero is a state (which is never achievable in reality) of maximum possible orderliness of matter. As we pass from $x \rightarrow x^2 \rightarrow x^3 \rightarrow x^4, \dots \rightarrow x^\infty$, the molecules are coming in more and more proximity to each other, energies are released more and more, a very much ordered arrangements of the molecules are formed.

Zero is mass wise approaching infinity and highly ordered. Whereas, zero is energy wise is very low in magnitude or randomness wise is very low or vanishingly small. It will be proved later that any variable in this universe can never attain a value of zero.

Infinity, on the contrary expresses a state, energy-wise in the maximum possible randomness. Mass-wise, infinity is vanishingly small. When we talk about infinite mass, that is really a point or, ‘SINGULARITY’, as will be proved in this article.

Summing up:

Infinite Mass \rightarrow volume or energy wise is vanishingly small or a state of perfect order.

Infinite volume or energy \rightarrow mass wise vanishingly small, maximum possible state of disordered or randomness.

2.3. Universal Energy-Equilibrium Relationship and Positive & Negative Inverse Physical Variables, the Concept of Real and Imaginary Numbers

If, the digits say 1, 2, 3, 4... represent volume then the following universal energy volume diagram can be drawn up. In this diagram (Figure 2.3.1), energy is equal to 3 PV, when $P=1$, energy is 3V. When $P>1$ energy $> 3V$ and when $P<1$, energy $< 3V$ (as shown in Fig.2.3.1 below)

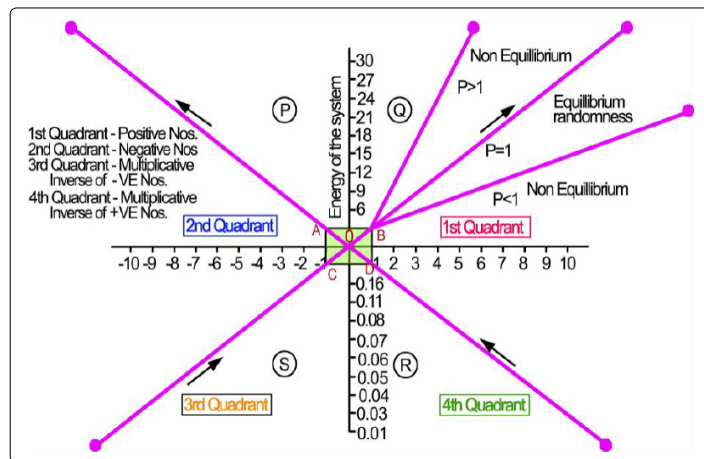


Figure 2.3.1: Universal Energy – Volume diagram

Q is the positive region

R is the inverse of positive region

P is the negative region

S is the inverse of negative region

The square region ABCD is a region of highest certainty or order and the point O is absolute certainty or order.

This point is in fact is not achievable, since then all the energies of the universe would have been converted to mass. The mass energy equivalence equation to be derived latter does not permit this. In this universe nothing can be absolutely certain.

Why it is said that (anything)/ ∞ or x/∞ is zero?

“Anything” in this universe is a hybrid of 0 (absolute order) and infinity (highest possible randomness). Please see the following Fig.2.3.2

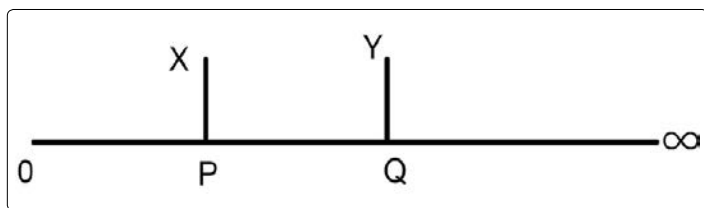


Figure 2.3.2: 0-Variable-Infinity schematic
Between 0 and ∞ the point P exists having a volume of x.

Now point P is a hybrid of say 80% order and 20% of randomness (∞). The point Q having a value of y, is a hybrid of 50% order and (0) 50% randomness (∞).

So any variable is a hybrid of order and randomness. When anything is divided by infinity, infinity pulls back the randomness part of variables towards it. So what is left, is the ordered part. This ordered part in absence of any randomness, starts shrinking (high level intermolecular attractive forces) and ultimately approaches zero or a state of perfect order. This is the reason why (anything)/ ∞ , is considered to be zero although it is not exactly being zero.

On the contrary when we divide anything by zero, say $x/0$, the zero pulls back the order part in itself. As a result the randomness part is left. This randomness part in the absence of any pull back Or the attractive forces start inflating and inflating and approaches infinity.

The multiplicative inverse of a variable, originates as a result of the reversal of curvature. The following figure no.2.3.3 can be noted in this context:

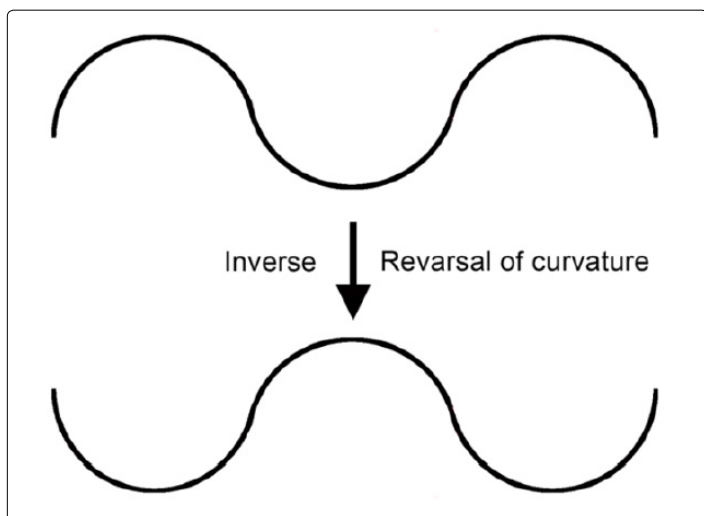


Figure 2.3.3: Inverse of a curved line (Reversal of curvature)

In the case of inversion of a circle From point P, Q, R and S as shown in Figure 2.3.4, the curvature of the circle are reversed and it becomes a saddle. So inverse of a circle is a saddle. Please follow the Figs.2.3.4 and 2.3.5 in this context as shown below

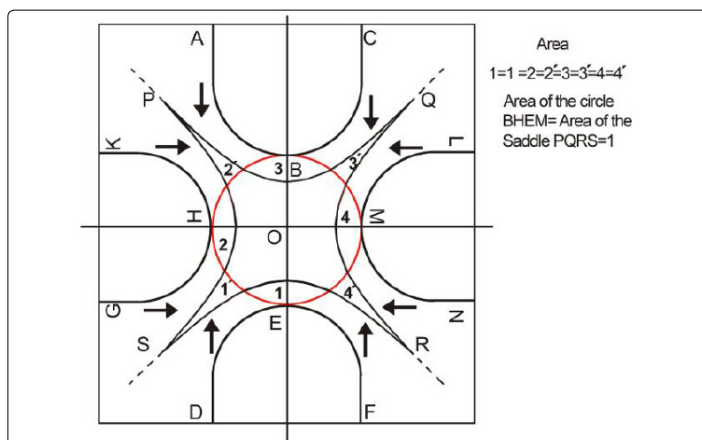


Figure 2.3.4: The inversion of a circle BHEM to form a Saddle PQRS (same area as that of the circle). The equation of a circle is $y^2 = (1-x^2)$ and the inverse function of circle $y'^2 = 1/(1-x^2)$ ABC is the inverse HBM portion of the circle. The inverse portions ABC, GHK, DEF and NML attract each other and the saddle PQRS is formed.

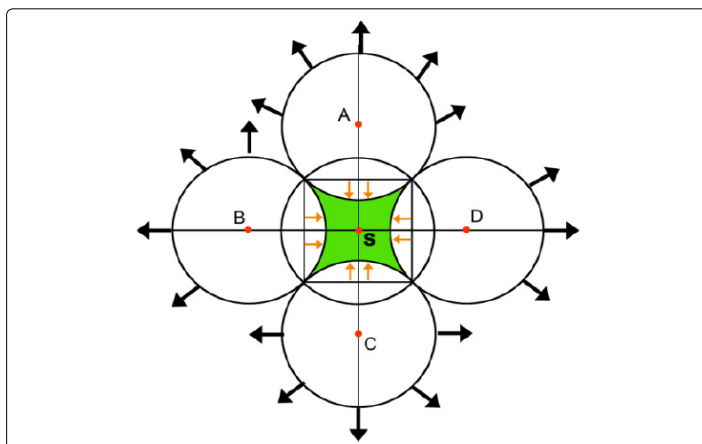


Figure 2.3.5: Formation of a 2-Dimensional Saddle (S) from 4 no. of Circles A, B, C & D

The multiplicative inverse is a result of the reversal of the push forward and pull-back forces. When the pullback force > push forward force, it is the ordered form of the variable. When PFF > PBF, the form of the variable is the random form.

In case of additive and subtractive inverse, the push forward and the pullback forces are just exceeding each other. When PFF is just greater than the PBF, the variable is an expanding variable (we call it positive) and when the PBF is just greater than the PFF, the variable is contracting (we call it negative). So when we add the subtractive inverse of a variable with the variable itself, i.e., x and $-x$, we reach to a sort of situation of stalemate of molecular movements due to the cancelling of equal positive and negative effects and as a result it resemble zero, a state of perfect order. This is the logic of the sum of a variable $+x$ and $-x$ being zero.

Concept of Imaginary number

There is a co-existence of a real variable and imaginary variable in the universe.

For any real variable (which we can observe with our own eyes), somewhere in the universe another variable (we call it imaginary, since we cannot see it) does exist and which does act in opposition to the direction of its growth or de-growth.

Say a volume V does exist, then there must be a volume $-V$ existing, which co-exists with V (Fig.2.3.6)

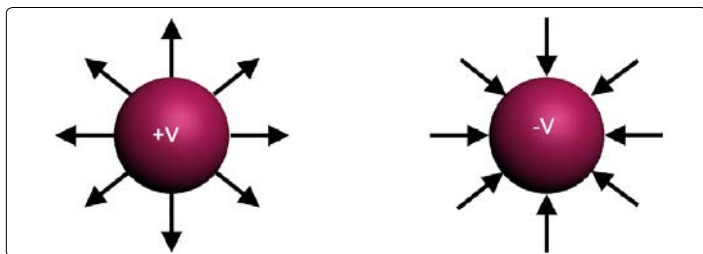


Figure 2.3.6: Positive and Negative Variables, the Direction of Change When V increases, $-V$ decreases.

It can be thought that $+V$ is formed from zero by increments and reached to $+V$ and $-V$ is an entity, from where some volume has been cut and that has been passed on to $+V$.

Now the concept of imaginary number is originated from volume expansion-compression phenomena.

If a variable, V , is squared to make it V^2 , it is a contraction (if it V is considered to be a variable like mass) and the molecular density is doubled on squaring.

Now to cope up with the squaring of $+V$, the variable $-V$ square roots itself to expand and make the molecular density half to the original. But, this expansion of $-V$, we cannot observe directly, so this is termed as an imaginary process, and $\sqrt{-V}$ is defined as an imaginary variable.

The real variable and imaginary variable originates from the mutual expansion-contraction phenomena.

If, $\sqrt{-V}$ is being considered real, then V^2 is imaginary, and if V^2 is considered real, then $\sqrt{-V}$ is imaginary.

Whenever we observe with our eyes in front of us, anything is getting expanded, somewhere in the universe a contraction in volume is taking place.

To sum-up, the universal convention is, Contraction, of a positive variable like mass \rightarrow squaring and real Expansion of a negative variable \rightarrow square rooting and imaginary

3. Fruit-seed Model of the Growth of Matter

A fruit grows from a seed. The seed leaches molecules from itself and those are being randomly distributed in the space within, and the fruit goes on growing. It is the average intermolecular distances between the molecules, which is the index of how much the fruit is grown in size.

When the average intermolecular distance is lower, the size of the fruit is small in size/volume and when the average intermolecular distance is higher the fruit is larger in volume/size.

We will prove in this article, that it is the average intermolecular distance which is directly related to the physical parameter of the universe like pressure, temperature, time, volume, entropy, enthalpy, free energy.... etc.

All the physical variables of the universe can be represented in terms of the average intermolecular distances.

The following figure (Fig.3.1) is to note From the said figure it is very much clear that the average intermolecular distance increases as the volume increases or vice versa.

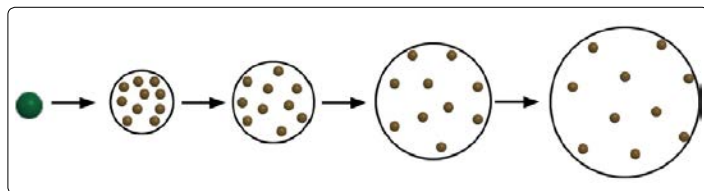


Figure 3.1: Representation of increasing average intermolecular distance with increase in the size of the circles all the circles contain 10 no. of molecules represented by dots (\cdot)

Now if the sphere's average radius is considered to be r Then $r = (n'-1)r' \approx n'r'$ (for very large value of n')

When n' is an integer 1, 2, 3, 4, 5, 6,... and it represents the average number of molecules along any radius of the sphere starting from the center of the sphere, r' being the average intermolecular distance.

The higher the surface area of the sphere forming higher is the randomness. Higher is the surface tension, lower is the randomness.

Higher be the ratio of surface area to surface tension, higher is the randomness and lower is the ratio of the said two parameters, lower is the degree of randomness.

This ratio (surface area/surface tension) is the actual index of randomness and we call it to be the absolute definition for "ENTROPY".

For matters expanding in equilibrium with the surroundings, for the fruit-seed model

$$\text{Force} = \text{Pressure} \times \text{Area} \\ = 1 \times 4\pi r^2 \quad (3.1)$$

$$\text{Surface tension} = \frac{\text{Force}}{\text{distance}} = \frac{4\pi r^2}{3r} = \frac{4\pi r}{3} \quad (3.2)$$

[In each 3 perpendicular mutual directions the average radius is r , so the total distance = $r + r + r = 3r$]

$$\text{So entropy} = 3r = \frac{\text{Surface area}}{\text{Surface tension}} = \frac{4\pi r^2}{\frac{4\pi r}{3}} \quad (3.3)$$

For 2-dimension

$$\text{Surface Area} = 2\pi r \quad (3.4)$$

$$\text{Force} = 1 \times 2\pi r = 2\pi r \quad (3.5)$$

$$\text{For 2-dimension surface tension} = \frac{2\pi r}{2r} = \pi \quad (3.6)$$

$$\text{So entropy} = \frac{\text{surface area}}{\text{surface tension}} = \frac{2\pi r}{\pi} = 2r \quad (3.7)$$

The absolute definition of entropy can be understood very straightforward too without even entering into the surface area to surface tension relationship. Since entropy is the index of randomness and randomness is directly linked to the net force within the matter. Higher the net force, on an average higher the radius of the sphere. In 3 dimension the sum of the distances (average radius) of the three perpendicular directions i.e., $(r+r+r) = 3r$, is the measure of entropy. In 2-dimension all over spread (multi directional spread) the some of the distances (average radius) in two perpendicular direction is the measure of entropy and which is $(r+r) = 2r$.

The randomness or energy of the system (as already defined) is

$$3PV = 3 \times 1 \times \frac{4}{3}\pi r^3 = 4\pi r^3 \quad (3.8)$$

3.1 Concept of Time and Temperature

Until now the parameter time is being expressed as distance. Distance and time cannot be the same. Once the true definition of time is evolved, the significances of all the physical variables of the universe will turn out to be different.

Time is related to the inter-molecular attractive forces or one may call "time" as a pull-back phenomena.

In the figure (Fig.3.1.1) below two persons are being shown and they are travelling in the same distance to reach to a post office box to drop letters.

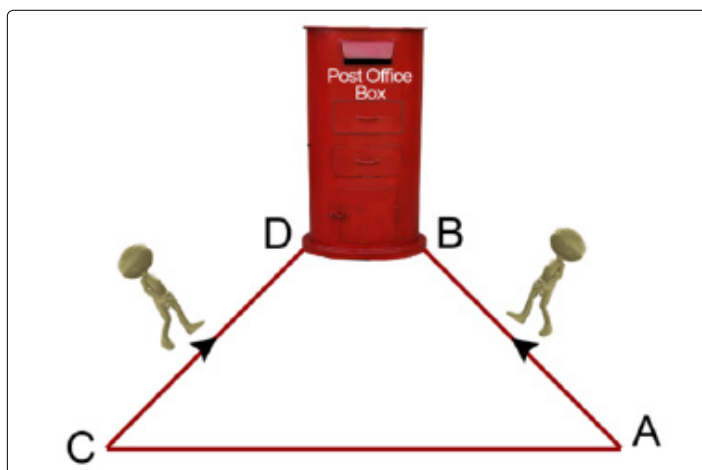


Figure 3.1.1: Two persons are Walking the same Distance $AB=CD$, to Drop Letter in a Post Office Box

Two persons as shown in Figure 3.1.1 are supposed to cover the same distance to drop letter in the post office box (by normal walking style of human being). Now as per the real concept of time, if one of the persons is pulled back by some invisible force towards the origin and another person does move on its own without any such pull back, then the time required for the first person to drop the letter would be considered to be more than the other person. In fact, higher would be the pull back, higher would be the time requirement.

In a matter, when the cohesive forces among the molecules are at their maximum level, the time reaches a value of infinity. This can be compared with the case of a 'Black-Hole'. In a Black-Hole in its most compressed state, the time is infinity, but if the Black-Hole would have expanded and expanded, the time would have decreased and decreased exponentially and would be approaching zero ultimately.

The concept of time could be built from an example of a football match. When a football match starts, the time in hand is say 90 minutes (conventional definition of time) and as the football match progresses, the time decreases and decreases, and becomes zero at the end of the match. The real concept of time is this. When the universe was born, the time was infinity (the molecular attractive forces were maximum). But as the universe is getting larger and larger the time is decreasing and decreasing.

The 'time' is a diminishing phenomenon with the expansion of the universe. 'Time' is a pullback force phenomena or inverse force phenomena. From the thermodynamic point of view, we defined time as,

$$t = \text{time} = \frac{(\text{entropy})}{(\text{energy or randomness})} = \frac{3r}{4\pi r^3} \quad (3.1.1)$$

The extent to which, the entropy is being pulled back by randomness or energy, is in fact the real 'time' variable of the universe.

$$\text{As } r \rightarrow 0 \quad t \rightarrow \infty$$

$$\text{As } r \rightarrow \infty \quad t \rightarrow 0$$

On the other hand, "Temperature" is the inverse of time. Temperature is the real inverse of pull back phenomena or it is a push forward phenomena

$$\text{So, } T = \text{Temperature} = \frac{\text{Randomness or energy}}{\text{entropy}} \quad (3.1.2)$$

So 'Temperature' is the measure of "the extent to which randomness pushes forward the entropy".

$$T = \text{temperature} = \frac{4\pi r^3}{3r} = \frac{4\pi r^2}{3} \quad (3.1.3)$$

$$\text{So, Time} \times \text{temperature} = \frac{3}{4\pi r^2} \times \frac{4\pi r^2}{3} = 1 \quad (3.1.4)$$

$$\text{So, pressure} = P = Tt = 1 \quad (3.1.5)$$

3.2 Concept of Volume and Velocity

Velocity in fact is very much related to the volume. The question arises that how the velocity (conventional definition) be the volume

$$\text{Velocity} = \frac{\text{Distance}}{\text{time}} \quad (3.2.1)$$

In the present fruit-seed model, distance is an integral multiple of inter molecular distance and can be expressed in the form of r and time, we already has defined as $(3/4\pi r^2)$

So velocity (by conventional definition)

$$= \frac{r}{\frac{3}{4\pi r^2}} = \frac{4\pi r^3}{3} \quad (3.2.2)$$

So, velocity in fact takes the shape of volume when the actual definition of time is considered.

It seems obscure but it is true. This is explained below more quantitatively.

The classical definition of Surface tension and viscosity are:

Surface Tension of a liquid = (Force/Distance) = (Energy /Area) = $(L^2MT^{-2})/L^2 = MT^{-2}$

Viscosity of a liquid = (Force/Area) x (Distance/Velocity) = $(L^2MT^{-2})/(L^2 \times L/T) = (MT^{-1})/L$

So, if the dimension of surface tension (ST) is being divided by the dimension of viscosity (VSC), one obtains $(ST/VSC = LT^{-1})$.

The parameter LT^{-1} stands for the dimension of velocity. But what this velocity stands for has not been evaluated and is still an unanswered question in science. However, no satisfactory explanation could be put forward of this 'apparent look' velocity dimension. The above said velocity dimension turns into a concept of 'volume' as is being shown below.

Surface tension is a hybrid phenomenon of 'order' and 'disorder'. While the 'volume' is a representation of 'randomness', the 'intermolecular attractive forces' is an index of 'order'. The physical variables 'volume' and 'intermolecular attractive forces' are the responsible physical variables, those give rise to the phenomenon of 'surface tension'. The surface tension can be expressed in the hybrid form as:

$$ST = \text{volume} \times \text{intermolecular attractive forces}$$

The viscosity of a liquid is directly related to the intermolecular attractive forces, the order creating physical variable. However, when one considers the flow of a liquid, the pressure is the actual physical variable which is responsible for flow. So viscosity is also another, 'order- disorder' hybrid phenomena. While the pressure imposes the 'randomness', the 'intermolecular attractive forces' try to retain the 'order'. So viscosity in the hybrid form can be written as

$$VSC = \text{pressure} \times \text{intermolecular attractive forces}$$

ST and VSC, both are directly proportional to 'intermolecular attractive forces' but the former is linked to 'volume' and the latter is linked to 'pressure'.

So, from the above discussion, one is led to conclude that,

$$ST/VSC = \text{VOLUME}/ \text{PRESSURE}$$

Now pressure is a dimensionless parameter (as has already been described in this article and has been discussed in the subsequent sections) and as a result the ratio of ST to VSC is a parameter which represents the dimension of 'volume'.

Now if the classical definition of the ratio of ST to VSC is being compared with the unified theory definition, as just arrived above, one obtains the following relationship:

$$ST/VSC = LT^{-1} = \text{volume} = L^3$$

$$\text{So, } T = \text{time} = (1/L^2)$$

So, the true dimension of 'time' is evolved. 'Time' is in fact an inverse force or an inverse area phenomenon of the universe.

Viscosity being the hybrid of molecular attractive force and pressure, de-hybridizes surface tension a (hybrid of molecular attractive force and volume) leaving behind the volume only as dimension, since pressure is dimensionless.

Two very important concepts do emerge from the above said exercise and those are:

- ime is an inverse force phenomena
- Velocity relates to volume when the actual dimension of time is taken into account.

Suppose in a vessel there exists a gaseous substance and it is under equilibrium with the surroundings at a constant pressure $P=1$ shown in Fig.3.2.1 below.

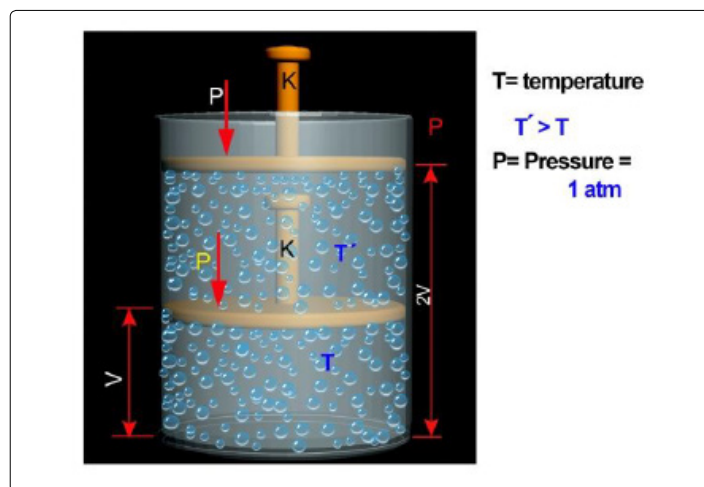


Figure 3.2.1: Volume of Gas related to the average random Motion of the Molecules of a Gas

If we increase the average velocity of the molecules by imparting energy in the system (by giving heat), the molecules get accelerated and under the equilibrium constant pressure condition the volume will go on increasing. If we go on supplying more heat in the system, the kinetic movement of the molecules will be higher and higher and the volume will also increase. If we extract out heat from the system the kinetic movements of the molecules will decrease and the volume will also decrease. So in fact velocity is truly a concept of volume rather than the directional displacements of the molecules of the system

Suppose a vehicle is moving on at a velocity of 100 km per hour (in the conventional definition of velocity). The moving vehicle pushes the molecules of the environment and its impact spreads on an average up to a certain distance as shown in the Fig. 3.2.2 below.

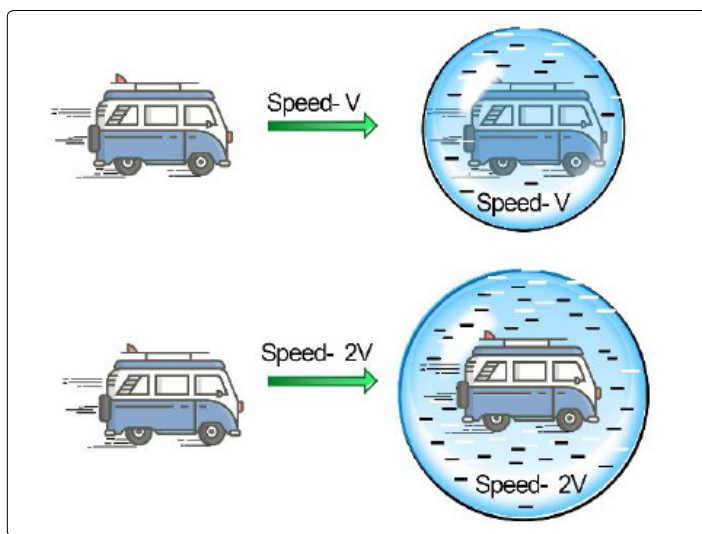


Figure 3.2.2: Pictorial Presentation of Creation of Volume as a function of the Speed of a Motor Vehicle

However, the effect of the push forward decreases exponentially with distance but at any particular instant it encompasses a certain volume (its own volume + encroached volume of the environment) and as long as the speed or kinetic movement of the vehicle is at the same level, the encompassed volume on an average is the same. Now if the kinetic movement is say just doubled, the push factor will be more and the encompassed volume will be much higher.

In the proposed theory all the physical variables of the universe like, length, area, volume, energy, time, and temperature... can be expressed in terms of intermolecular distances or the inverse of the intermolecular distances. The smallest possible intermolecular distance is not the Planck length (we will show later what it is exactly), the inverse dimensions are still smaller than Planck lengths.

So, all the physical variables are integral multiples of the intermolecular distances or the inverse of intermolecular distances. In other words this universe is integral with respect to all the physical variables and 'fraction' is simply a parameter which is of mathematical validity only and has no existence in reality.

The main postulates of the unified quantum gravity (QG) theory of the universe can be summarized as under:

1. Inverting lengths (or inverting entropy gravitons) in all 3 principal directions form masses.
2. Expanding lengths (or entropy gravitons) in all the 3-principal direction generates volumes or energies.
3. This universe is an integral universe and originates from the disintegrations of the 'SINGULARITY' gravitons. The universe is integral in regard to principally, the entropy gravitons and the anti-entropic or order gravitons.
4. Gravitational field is basically an inverse acceleration field, originated from the mutually interacting astronomical bodies of the universe and the different types of gravitons are evolved from the said inverse acceleration fields. The acceleration field in turn, is linked to the intermolecular attractive forces.
5. Gravitational constant G , as proposed by Sir Isaac Newton is not a constant and is a variable of the universe and is a composite variable function of mass, distance of separation of two objects, the time and the forces acting between the two objects.
6. The universe is formed by the translational motion of the entropy/order gravitons coupled with their rotations and twisting. Any geometrical or real object; one can draw from a point only (Fig.3.2.3).

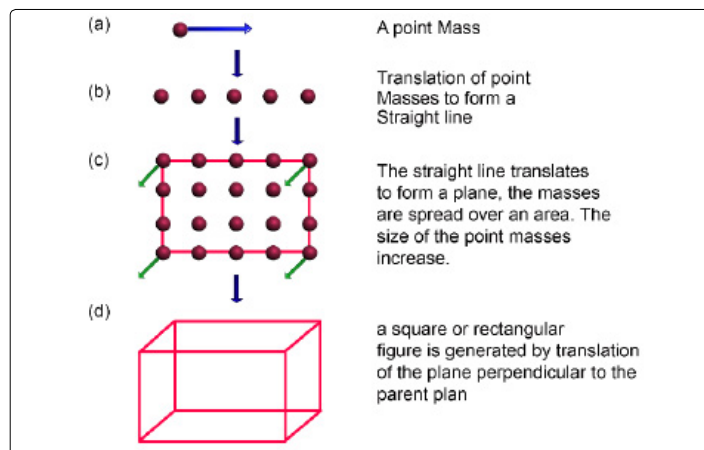


Figure 3.2.3: Translation of point masses and straight line to reach to 3-dimensional ordered geometrical ordered figure

7. Time is a pull-back phenomena and is an inverted circle which acts in opposition to the forward movement of the molecules. Time is a pull-back inverting phenomena as shown in Fig.3.2.4 below

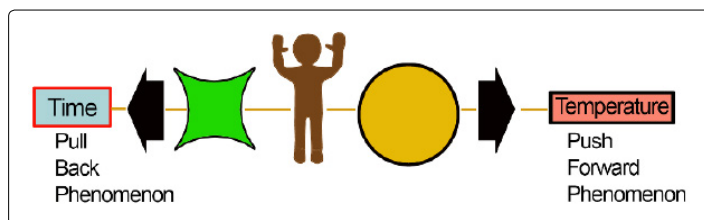


Figure 3.2.4: Schematic Presentation of time & Temperature

8. Temperature is a push forward phenomenon and is a circle too and which accelerates the forward movement of the molecules

9. Time and temperature is just multiplicative inverse to each other. So the universe can be represented by a time-temperature mathematical equation

$$t T = 1$$

10. There is no such variable as 'velocity' in the true sense. Velocity in fact is volume and the average volume increases with the average random motion of the molecules. The measure of average random motion of the molecules is 'entropy' but not velocity. There is no such thing in the nature as truly directional. Whatever we find or watch as a directional, ultimately it is converted to randomness.

11. All the 3 laws of motion of Sir Isaac Newton has got serious limitations, especially in a molecular level and that will be elaborated later.

12. Einstein's equation, $E = mc^2$, relating mass (m), energy (E) and velocity of light (c), has also got serious limitation and is not at all a representation of true mass- energy equivalence of the universe.

True concept of work

As per the conventional definition of work, work = Force x distance. Whenever one applies force on any object and the object moves, some work is being done as per conventional definition. In fact when we kick a foot-ball, throw a ball, pushes a heavy object; we create randomness or multidirectional entropy. The impact of the force is randomly distributed over all the directions. True 'work' is the creation of 'unidirectional entropy'. One needs to localize energy towards a definite direction (this is called unidirectional entropy) to produce true 'work'. 'Work' is order and to create work, energy localization is the only way out. A Carnot engine in fact generates unidirectional entropy by localization of energy and this localization of energy in the engine pushes a vehicle towards a certain direction. The real meaning of the 2nd law of thermodynamics (heat cannot be completely converted into work) has not been interpreted truly in most of the physics/physical chemistry text books. Often it is shown in the Text Books upon heating a gas in a vessel (containing a gas) fixed with a piston, the piston moves and work is done. This is a mis-concept. Whenever, heat is given to such a system, the random movement of the molecules increase and as a result of the higher level of thrust on the piston, the piston moves. This movement of the piston is a result of creation of multi directional entropy. To get real work, one needs to create unidirectional entropy. All these will be elaborated in the latter part of the article.

In fact, Heisenberg's uncertainty principle and second law of thermodynamics, rests simply on the mass-energy equivalence of the universe and both converge to the same point.

3.3 Concept of Mass and Acceleration

We now derive the expression of acceleration and mass in terms of the intermolecular distance.

Acceleration by definition is the rate of change of velocity with time. Now velocity equates to volume, once the true definition of time is adopted.

$$\text{So, Acceleration} = \frac{\text{Velocity or Volume}}{\text{time}} = \frac{\frac{4}{3}\pi r^3}{4\pi r^2} = \frac{16\pi^2 r^5}{9} \quad (3.3.1)$$

So, acceleration is a five-dimensional entity and it represents how the volume changes with time.

To derive the expression of mass, we will use the fundamental equation of pressure and which is

$$\text{Pressure} = h.p.g \quad (3.3.2)$$

h = height or depth; ρ = density; g = acceleration

Now this can be shown simply as a product of push forward and pull back phenomena on rearranging.

$$\begin{aligned} \text{Pressure} = P &= h\rho g = h \times \frac{\text{Mass}}{\text{Volume}} \times \text{acceleration} : \\ &= \frac{h}{\text{Volume}} \times \text{mass} \times \text{acceleration} \\ &= \left(\frac{\text{distance}}{\text{volume}}\right) \times (\text{mass} \times \text{acceleration}) \end{aligned} \quad (3.3.3)$$

The first part of the above equation, (distance/volume), can be compared to (entropy/randomness) or pull back and the second part is the push forward force.

So, Pressure = pull back force x push forward force. For a matter in equilibrium with the surroundings, $P = 1$.

Now h here is the depth of the matter

$$= \frac{\text{volume}}{\text{surface area}} = \frac{\frac{4}{3}\pi r^3}{4\pi r^2} = \frac{r}{3} \quad (3.3.4)$$

$$\text{So, } P = 1 = \frac{\left(\frac{r}{3}\right)}{\left(\frac{4}{3}\pi r^3\right)} \times m \times \frac{16\pi^2 r^5}{9} \quad (3.3.5)$$

$$m = \text{mass} = \frac{4}{3}\pi r^3 \times \frac{3}{r} \times \frac{9}{16\pi^2 r^5} = \frac{9}{4\pi r^3} \quad (3.3.6)$$

Now momentum = mass x volume

$$= \frac{9}{4\pi r^3} \times \frac{4}{3}\pi r^3 = 3 \quad (3.3.7)$$

So, momentum is a constant and can be equated to 3.

Energy (E) is, Force x distance

$$= 4\pi r^2 \times r = 4\pi r^3 \quad (3.3.8)$$

$$\text{Now mass} \times \text{energy} = \frac{9}{4\pi r^3} \times 4\pi r^3 = 9 \quad (3.3.9)$$

4. Unification of the Classical Definition of Time and Entropy with the QG Theory Definition

The pendulum law relates 'time' (T) to the 'acceleration due to gravity' (g) and length of the pendulum (l) by the following mathematical equation

$$T = 2\pi \sqrt{\frac{l}{g}} \quad (4.1)$$

Now, it will be examined that whether the dimension of time, as derived in the QG theory in this article, both in 2- and 3-dimensions, is/are in conformity or not, with the most fundamental definition of time, in classical physics, when the definition of classical physics, is being viewed in the light of the proposed QG theory.

The dimensionalities of l in Eq.(4.1) is simply r (entropic, since it is a length). Since, g is acceleration due to gravity, so it will have dimensionalities in Eq.(3.3.1) and Table 5.1, for 2- and 3-dimensions respectively

$$\text{2-dimension: } l = r \quad g = \pi^2 r^3$$

$$\text{So, } T/2\pi = \text{Time per radian} = \sqrt{\frac{l}{g}} = \sqrt{\frac{r}{\pi^2 r^3}} = \sqrt{\frac{1}{\pi^2 r^2}} = \frac{1}{\pi r} \quad (4.2)$$

So time (t) in 2-dimension turns out to be (1/πr), as has been derived in QG theory.

$$\text{3-dimension: } l = r, g = (\pi^2 r^5/9)$$

$$\text{So, } T/2\pi = \text{Time per radian} = \sqrt{\frac{l}{g}} = \sqrt{\frac{rx9}{16\pi^2 r^5}} = \sqrt{\frac{9}{16\pi^2 r^4}} = \frac{3}{4\pi r^2} \quad (4.3)$$

So, the time (t) in 3-dimension, turns out to be (3/4πr²), as has already been derived in QG theory directly.

Dimension of 'Entropy' of Unified QG Theory vis-a-vis the Dimension of Entropy in Classical Thermodynamics

Classical Thermodynamics, define entropy of a substance, as

$$\text{entropy} = \frac{q}{T} \quad (4.4)$$

Where q is the amount of heat introduced in the substance for reaching to a temperature T (Kelvin) from absolute zero of temperature. So, q is the total amount of energy, in fact the substance possesses at a temperature T.

So 'q' can be diagnosed as the energy of a system in QG Theory, i.e., 4πr³. The temperature in QG theory has been designated as $\frac{4}{3}\pi r^2$.

So, in the light of the QG theory, the absolute definition of entropy in Classical Thermodynamics transforms to

$$\text{Entropy} = \frac{4\pi r^3}{\frac{4}{3}\pi r^2} = 3r \quad (4.5)$$

In QG theory, the entropy has been directly derived as '3r'.

This is again a, conformity or unification of Classical Thermodynamics and QG theory in regard to the dimensional

definition of the universal physical variable, 'entropy'.

Representation of the Principal Physical Variables in Regard To qg Theory in 2- and 3-Dimensions

Time, velocity, momentum, mass, acceleration, density entropy, force, energy.... can all be represented in this model. In terms of r, in both 2- and 3-dimensions. This is shown in the following table.

Table 5.1: QG theory derived quantum units in 2- and 3-dimensions of the principal physical variables of the universe

Sl. No.	Physical Variable	2-dimension	3-dimension
1.	Depth of matter	Area/circumference = $\pi r^2/2\pi r = r/2$	Volume/surface area = $4/3\pi r^3/4\pi r^2 = r/3$
2.	Force	Pressure x circumference = $2\pi r \times l = 2\pi r$	Pressure x area = $4\pi r^2 \times l = 4\pi r^2$
3.	Energy	Force x distance = $2\pi r \times r = 2\pi r^2$	Force x distance = $4\pi r^2 \times r = 4\pi r^3$
4.	Entropy	2r	3r
5.	Time	$\frac{\text{entropy}}{\text{energy}} = \frac{2r}{2\pi r^2} = \frac{1}{\pi r}$	$\frac{\text{entropy}}{\text{energy}} = \frac{3r}{4\pi r^3} = \frac{3}{4\pi r^2}$
6.	Temperature	$\frac{\text{energy}}{\text{entropy}} = \frac{\pi r^2}{2r} = \left(\frac{\pi r}{2}\right)$	$\frac{\text{energy}}{\text{entropy}} = \frac{4\pi r^3}{3r} = \left(\frac{4}{3}\pi r^2\right)$
7.	Velocity	$\frac{\text{distance}}{\text{time}} = \frac{r}{\frac{1}{\pi r}} = \pi r^2$	$\frac{\text{distance}}{\text{time}} = \frac{r}{\frac{3}{4\pi r^2}} = \frac{4}{3}\pi r^3$
8.	Acceleration	$\frac{\text{velocity}}{\text{time}} = \frac{\pi r^2}{\frac{1}{\pi r}} = \pi^2 r^3$	$\frac{\text{velocity}}{\text{time}} = \frac{\frac{4}{3}\pi r^3}{\frac{3}{4\pi r^2}} = \frac{16\pi^2 r^5}{9}$
9.	Mass	$l = \frac{\text{dept hof matter}}{\text{area}} \times \text{mass} \times \pi^2 r^3 = \frac{r}{2\pi r^2} \times \text{mass} \times \pi^2 r^3$ $\text{Mass} = \frac{2\pi r^2}{\pi^2 r^4} = \frac{2}{\pi r^2}$	$\text{Mass} = \frac{9}{4\pi r^3}$
10.	Momentum	Mass x volume = $\frac{2}{\pi r^2} \times \pi r^2 = 2$	$= \frac{9}{4\pi r^3} \times \frac{4}{3}\pi r^3 = 3$
11.	Density	$\frac{\text{Mass}}{\text{Volume}} = \frac{\left(\frac{2}{\pi r^2}\right)}{(\pi r^2)^2} = \frac{2}{(\pi r^2)^2} = \frac{2}{(\text{area})^2}$	$\frac{\text{Mass}}{\text{Volume}} = \frac{\frac{9}{4\pi r^3}}{\frac{4}{3}\pi r^3} = \frac{27}{(4\pi r^3)^2} = \frac{27}{9 \times \left(\frac{4}{3}\pi r^3\right)^2} = \frac{3}{r^2}$

The Planck units as derived by Max Plank converges to the above derived units, will be shown latter as we derive what gravitation is.

$$\text{Now energy} = 4\pi r^3 \text{ or Energy} = 3x \frac{3}{4\pi r^2} x \frac{16\pi^2 r^5}{9} = 3x = 3x \text{ time} \times \text{acceleration} \quad (5.1)$$

Now time is a decreasing function of r and acceleration is increasing function r . From equation (5.1), it is revealed very much that energy cannot go on increasing and increasing (the phenomenon of UV catastrophe of Classical Physics) since energy is a hybrid of an increasing function and a decreasing function. So energy will go high and higher but after a certain point it has to decrease. This also explains the shapes of the typical Black Body Radiation curves as well. In this article, the shape of the typical Black Body radiation curves have been explained several ways latter.

The 4 very important equations derived are

$$mv = 3 \quad (5.2)$$

$$Tt = 1 \quad (5.3)$$

$$mE = 9 \quad (5.4)$$

$$E = 3V \quad (5.5)$$

Pseudo 3-Dimensionally of Matter/Universe.

A 3-dimensional matter, which we see with our eye, indeed contains infinite numbers of dimensions embedded in it. Although, apparently, a matter looks to be a 3-dimensional entity (See Fig.5.1).












SL No.	FIGURE	DIMENSION & DESCRIPTION	MOVEMENT	RESULTING FIGURE
1		3 Sphere	a line added to it which emerges from the sphere's own Dimension	
2		4 Sphere + Line	The line Rotates in the Horizontal Plane	
3		5 Circle Inscribed Sphere	The Circle Rotates in the Vertical Plane	
4		4 Sphere inscribed sphere, the core sphere and the outer sphere merge to return back to 3 dimension and a line is added	The Line Moves in Horizontal Plane	
5		5 Sphere Same as SL.No.-3	The Circle Rotates in the Vertical Plane	
6		Sphere inscribed sphere, the core sphere and the outer sphere merge to return back to 3 dimension and a line is added	The line Moves in Horizontal Plane	

Figure 5.1: Dimensions Verses Growth of Matters

Translation cannot create randomness. The maximum randomization occurs on rotation of straight line to form a circle (see Fig.5.2).

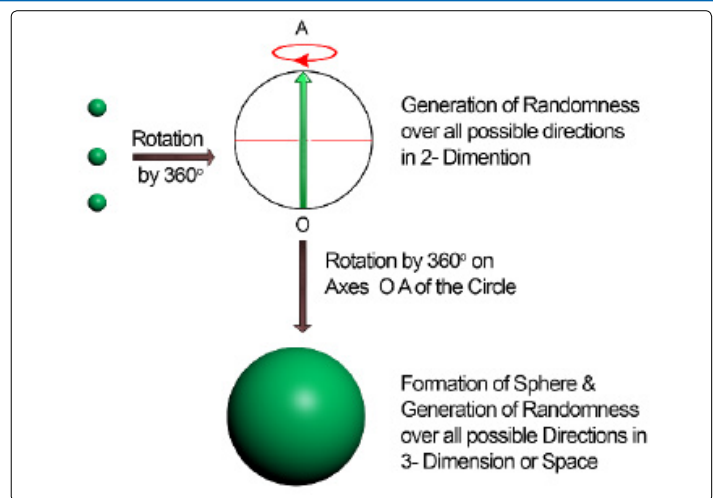


Figure 5.2: Rotation of Molecules & Generation of Randomness in 2&3 Dimensions

The circle rotates along the axes shown in the above figure to form a sphere. Maximum randomization of the point masses occur and the point masses become bigger in size. What the point masses are in reality, will be explained in this article in the subsequent section.

Now this growth is not stopped. The growth of the matter continues.

Now rate of localization of energy, is the rate of increase of mass with time

$$\frac{m}{t} = \frac{\frac{9}{4\pi r^3}}{\frac{3}{4\pi r^2}} = \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} = \frac{3}{r} \quad (5.6)$$

Rate of delocalization of mass, is rate of change of energy with time

$$\frac{E}{t} = \frac{4\pi r^3}{3} = \frac{16\pi^2 r^5}{3} \quad (5.7)$$

So, rate of localization of energy x rate of delocalization of mass

$$= \frac{3}{r} \times \frac{16\pi^2 r^5}{3} = 16\pi^2 r^4 \quad (5.8)$$

$$= 9 \times \frac{16\pi^2 r^4}{9} = 9 \times \left(\frac{4\pi r^2}{3}\right)^2 = \frac{9}{t^2} \quad (5.9)$$

$3T = (\text{Rate of delocalization of mass [RDM]} \times \text{Rate of localization of energy [RLE]})^{1/2}$

$$\text{Temperature} = T = \frac{(RDM \times RLE)^{1/2}}{3} \quad (5.10)$$

$$\text{Time} = t = \frac{3}{(RDM \times RLE)^{1/2}} \quad (5.11)$$

$$\text{or Temperature} = T = \frac{(\text{Rate of generation of energy} \times \text{rate of generation of mass})^{1/2}}{3} \quad (5.12)$$

$$\text{or Time} = t = \frac{3}{(\text{Rate of generation of energy} \times \text{rate of generation of mass})^{1/2}} \quad (5.13)$$

6. Origin of Gravitation

Gravitation in fact, is originated from molecular attractive forces or Van der Wall's forces. Lei Zhang [3] had given a very logical explanation of this spread of Van der Wall's forces up to a very large distance, in his article, entitled "The Van der Walls force and gravitational force in matter".

If one considers a heavy astronomical object, in it, the innumerable infinitesimal Van der Walls force fields do overlap and converge, on an average, to a single, integrated and high magnitude attractive force field. This said, high magnitude attractive force field acts as some squeezing force, acting on the other astronomical object situated at a certain distance from the first heavy astronomical object. As a result of this, the second astronomical object, experiences, a squeezing or an inverse acceleration. So an inverse acceleration field is evolved from the center of Mass of the second astronomical object. The second astronomical object, in a similar fashion, imparts a squeezing force on the first astronomical object and another inverse or squeezing acceleration field is also evolved from the center of mass of the first astronomical object. So 'Gravitation' being a tangible physical variable, can be viewed as an overlapping field of 2 nos. of mutually interacting inverse accelerations, as explained above. Gravitation being the most important phenomenon of the universe, can be defined also as 'diminishing, but infinitely spread Van der Walls force field in space' (see Fig.6.1).

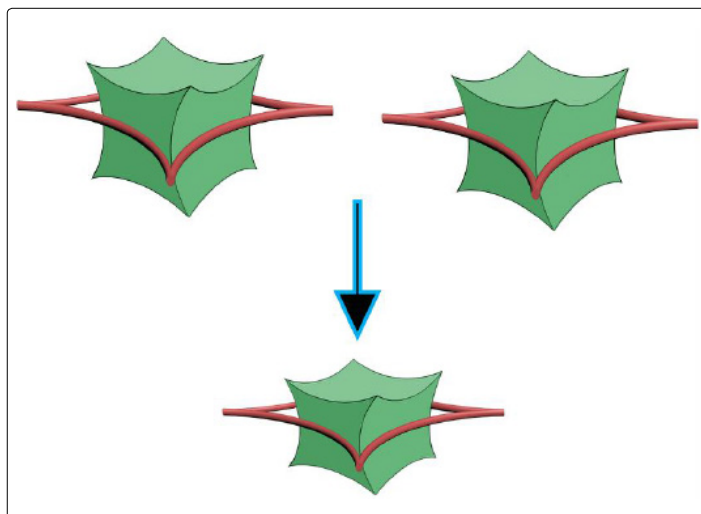


Figure 6.1: Overlapping or Hybrid of 2 no. of Inverse acceleration fields

Suppose there are two number of masses of radius r and are situated at a distance $R (= nr, n$ is an integer) from each other as shown in Fig.6.2 below

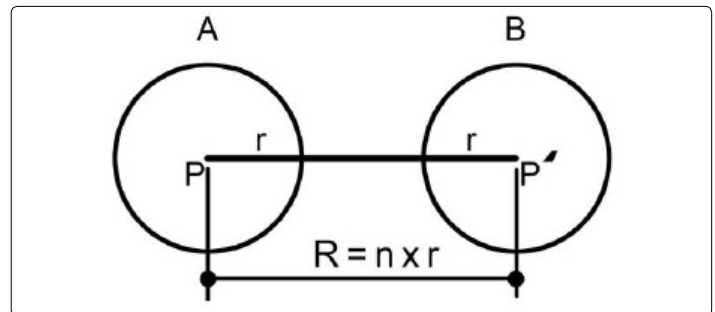


Figure 6.2: Gravitational Interaction of two numbers 'A' and 'B', $n = \text{Integer}$

Gravitation in fact, is originated from molecular attractive forces. The molecules of A attracts the molecules of B and molecules of B attracts the molecules of A. So both A and B go under some acceleration. As a matter of fact the two accelerators fields overlap with each other and the gravitational force field do generate. The result of such overlapping may be called as an overlapping of two numbers of inverse acceleration fields and can be represented as:

$$\frac{9}{16\pi^2 r^5} \times \frac{9}{16\pi^2 r^5} \quad (6.1)$$

So, if acceleration is represented by f then gravitation in the form of super 'graviton' or 'singularity' (to be elaborated later) being a pullback phenomenon will be,

Super Graviton or Super entropic Graviton or Singularity = (inverse acceleration)²

$$= \frac{1}{f^2} \quad (6.2)$$

Why this is called 'super graviton' or 'super entropic Graviton' or a 'Singularity' and how a 'Super graviton' step-by-step transforms to entropy and what in fact is the phenomenon of an 'entropy to entropy' flight of the super graviton, has been discussed in details from Section 12 to Section 13

However, the dimensionality of the super graviton is 10,

Now as per Newton's law of gravitation for two masses (each is of radius r) separated by a distance R the gravitational constant G can be equated to as shown below

$$G = \frac{R^2 \times \text{force}}{m^2} [R = nr] \quad (6.3)$$

Here n is a integral multiple of the entropy, r

If the dimensions force and mass are put in the above equation, the Newton's Gravitational constant become

$$G = \frac{r^2 \times 4\pi r^2}{\left(\frac{9}{4\pi^3}\right)^2} \times n = nx \frac{16\pi^3 r^{10}}{81} = \frac{n}{4\pi} x (\text{acceleration})^2 \quad (6.4)$$

$$\text{Gravitational constant of Newton} = \frac{n}{4\pi} \cdot f^2 \quad (6.5)$$

So Gravitational constant of Newton was an obscure entity in the form of Newton kg^{-2}m^2 but the present theory explores it in the form of distinctly dimensionally understood physical variable as (acceleration)².

Newton's gravitational constant is placed, however, in the reverse sense than what gravitation is in reality and that will be proved now.

The dimension of gravitational constant (G) can be written as (from equation 6.3) :

$$G = \text{Gravitational constant of Newton} = (\text{Force} \times \text{Area}) / (\text{Mass} \times \text{Mass}) = (\text{LMT}^{-2})\text{L}^2/\text{M}^2 = \text{T}^{-2}\text{L}^3/\text{M}$$

$$\text{So, } G \times (\text{M/L}^3) \times \text{T}^2 = 1.00 \quad (6.6)$$

Since (M/L³) has a dimension of density, one can write,

$$G \times \text{Density} \times \text{T}^2 = 1.00 \quad (6.7)$$

G can also be written in the other form as,

$$G = (\text{Mass} \times \text{acceleration} \times \text{distance} \times \text{distance}) / (\text{Mass} \times \text{Mass})$$

$$\text{Or, } G = (\text{acceleration} \times \text{distance} \times \text{distance}) / (\text{mass})$$

$$\text{Or, } G = (\text{Acceleration} \times \text{L}^2) / \text{M}$$

$$\text{Or, } G \times \text{mass} \times (1/\text{acceleration}) \times (1/\text{L}^2) = 1.00 \quad (6.8)$$

As per Eqn. (6.8), one can take masses of any magnitude of desire, place them at any distance and can vary the acceleration as per his own choice. As a result, the term, mass x (1/ acceleration) x (1/L²), can never be a constant. So, if G is considered to be a constant, the Eqn. (6.8) will never give a result of unity. So, G has to attain different values to make Eqn. (6.8), valid. So, the Newton's Gravitational constant cannot be considered to be a constant at all.

Again, as it is found from Eqn. (6.7), for a fixed value of time, T, the densities can have many values. On the contrary for a fixed density, the time T, can have different values. So again G, ceases to be a constant since if G is a constant and (Density x T²) have different values, Eqn. (6.7) will not be a valid equation. So the magnitude of G has to vary and has to vary in a fashion such that the magnitude of G and (Density x T²) has to be multiplicative inverse to each other and the value of Eqn. (6.7) is always being unity.

A very strong mathematical logic of non-constancy of the Gravitational constant G, is being represented below:

Eqn. (6.3) can be rearranged as :

$$F = G (m^2/R^2) \quad (\text{the two masses of same magnitude of } m) \quad (6.9)$$

$$m = (F^{1/2} R) / G^{1/2} \quad (6.10)$$

Considering the constancy of the value of G and applying the mathematical theorem of joint variation, it can be concluded from equation Eqn. (6.10):

$$m \propto R \quad (6.11)$$

$$m \propto F^{1/2} \quad (6.12)$$

Now m and R are fully independent variables since mass (m) is not dependent on the distance of separation or the vice versa. So they under any circumstances cannot become directly proportional to each other.

So, the concept of G being a constant leads us to non-reality situations. From this mathematical analysis it can be concluded that G is not a constant at all. G is a variable and is a composite function of force, mass and distance.

A very strong evidence that G does not represent the phenomenon of Gravitation in the proper sense is revealed from the following exercises:

$$\text{Eqn. (6.3) is: } G = \frac{R^2 \times \text{force}}{m^2}$$

So, when $m \rightarrow \infty$, $G \rightarrow 0$ and when $m \rightarrow 0$, $G \rightarrow \infty$

In the event of masses being enormously higher, the gravitational pull should be pretty high in magnitude and when the masses are vanishingly small, the pullback force should be very feeble. However, the pattern of G as per equation (6.3) just reflects the reverse picture.

If we define a function G' and which is equal to (1/G), then we get the proper representation of Gravitation, then equation (6.3) transforms to :

$$G' = \frac{m^2}{R^2 \times \text{force}} \quad (6.13)$$

When $m \rightarrow \infty$, $G' \rightarrow \infty$ and when $m \rightarrow 0$, $G' \rightarrow 0$. This is in conformity with the phenomenon of gravitation.

So, Newton's Gravitation theory suffers from the following two numbers of serious limitations:

1. The Gravitational constant G as defined by Newton is not a constant and is a variable physical parameter of the universe and is a function of time.
2. Presenting gravitation in the form of 'G', does not truly represent the phenomenon of gravitation. In fact, the inverse of the function G, represents the gravitation phenomenon properly. G in Newton's law is being placed in the reverse fashion than what "gravitation" is.

The same logic applies to the Hubble's constant.

6.1 Gravitation-Time Composite Variable

Gravitation and time is a composite entity 12-dimensional and is related to mass

$$\text{Gravitation x time} = \frac{1}{f^2} \times \frac{3}{4\pi r^2} = \frac{1}{\left(\frac{16\pi^2 r^5}{9}\right)^2} \times \frac{3}{4\pi r^2} = \frac{243 \times 1}{4 \times 256 \times \pi^5 r^{12}} = \left(\frac{9}{4\pi r^3}\right)^4 \cdot \frac{1}{27 \times 4\pi} = \frac{m^4}{108\pi}$$

(6.1.1)

So, Gravitation x time = [(mass)⁴]/(108π)

$$\text{Now volume} = \frac{3}{\text{mass}} \quad (6.1.2)$$

So, Singularity Graviton x time

$$= \frac{81}{V^4} \cdot \frac{1}{108\pi} = \frac{3}{4\pi} \cdot \frac{1}{V^4} \quad (6.1.3)$$

$$\text{Or, mass} = (108\pi \cdot G \cdot t)^{1/4} \text{ and volume} = \left(\frac{3}{4\pi G t}\right)^{1/4} \quad (6.1.4)$$

$$\text{Or, } V^4 = \frac{3}{4\pi G t} \text{ or } V^4 = \left(\frac{4}{3} \pi r^3\right)^4 \quad (6.1.5)$$

$$\text{So, } \left(\frac{4}{3} \pi r^3\right)^4 = \frac{3}{4\pi G t} \quad (6.1.6)$$

$$\text{Or, } \frac{256}{81} \pi^4 r^{12} = \frac{3}{4\pi G t} \quad (6.1.7)$$

$$\text{Or, } r = \left(\frac{243}{1024 G t \pi^4}\right)^{1/12} \quad (6.1.8)$$

Gravitation-time composite variable is very important function as is understood from the above mathematical exercises. This mathematical exercise relates to the geometry of gravitation very much meaningfully and gives us a converging concept of gravitation time composite.

So, the entropy or intermolecular distances are related to the "Gravitation and time" composite entity.

How the acceleration and gravity look like are shown below (Fig.6.1.1) (3-dimensionally)

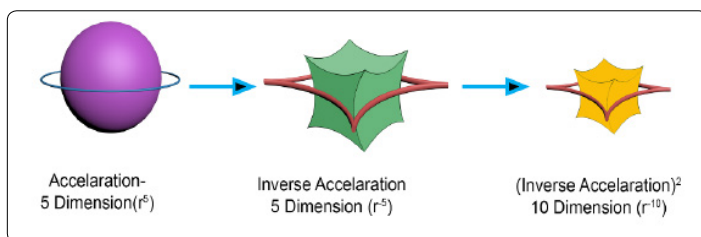


Figure 6.1.1: Schematic representation of "Acceleration", "Inverse Acceleration" and "Gravitation"

The very famous Lenard-Jones potential equation contains 2 parts. One is the attractive part and has been shown to be in the form of r⁻⁶ (r is the intermolecular distance) and the repulsive part is in the form of r¹².

Now attractive force among the molecules is related to the density of the matter. Higher the density, higher would be the attractive forces between the molecules.

$$\text{Now, density} = \frac{3}{V^2} = \frac{3}{\left(\frac{4}{3}\pi r^3\right)^2} = \frac{81}{16\pi^2 r^6} \quad (6.1.9)$$

So, the attractive part of Lenard-Jones potential equation is found justified.

The repulsive force part is in fact the composite entity, (G x t). Since gravitation and time both are pull back phenomena. So, when the said composite entity acts on the molecules, the molecules come so close to each other such that, a net repulsive force is generated as a back-up force and the molecules experience repulsive force and get separated from each other more.

$$\text{Now, Gt} = 12\text{-dimensional} = \frac{243}{1024\pi^5 r^{12}} \quad (6.1.10)$$

Lenard-Jones potential curve as already mentioned in this article expresses the energies of interactions between the molecules by an empirical relation which is in the form of the power of the intermolecular distances. The attractive part is proportional to (-1/6) and the repulsive part is proportional to (-1/12) of the average intermolecular distances.

So, the repulsive interaction is in fact related to (-1/12) and which is the power of the intermolecular distance.

So as a whole, the Lenard-Jones potential gets justification (in the form of attractive and repulsive forces among the molecules) from the proposed theory.

6.2 Dimensionality of the Universe:

The dimension of the universe [4] is to be expressed as the hybrid of mass, distance, intermolecular forces, energy and time.

So, the repulsive interaction is in fact related to (-1/12) and which is the power of the intermolecular distance.

So as a whole, the Lenard-Jones potential gets justification (in the form of attractive and repulsive forces among the molecules) from the proposed theory.

Now Gt is the extreme form of attractive forces and energy E, is the randomness. Hence the dimensionality of the universe can be expressed as the hybrid of gravitation (G), time (t) and temperature (T). Gt being the pull back and T being the push forward, so dimensionality of the universe is a pull back-push forward phenomenon.

Dimensionality of the universe = pull back x push forward

$$= G \times t \times T = \frac{1}{\left(\frac{16\pi^2 r^5}{9}\right)^2} \times \frac{3}{4\pi r^2} \times \frac{4\pi r^2}{3} = \frac{81}{256\pi^4 r^{10}} = \left(\frac{9}{16}\right)^2 \frac{1}{(\pi^2)^2} \frac{1}{(r^5)^2}$$

$$(6.2.1)$$

So, the universe is 10-dimensional. However, the dimensionality can go up to maximum 12-dimension when we consider the very special cases of supernova and cosmic rays and this subject will be elaborated later in this article.

When singularity (SGR) acts on energy (E), masses are being generated, and this can be shown as

$$(SGR) \times (E) = \frac{1}{\left(\frac{16\pi^2 r^5}{9}\right)^2} \times 4\pi^3$$

$$(6.2.2)$$

$$\text{or } (SGR) \times (E) = \frac{1}{36\pi} \cdot m^4 \cdot f = \frac{1}{36\pi} \cdot M \cdot f \quad (M=m^4)$$

$$(6.2.3)$$

So, the energy and gravitation interact with each other and massive particles (mass $M = m^4$) are generated.

The form of the product of gravitation and energy in equation 6.2.3, is the similar to the Newton's expression of, Force = mass x acceleration, but here the masses are very heavy masses. In fact, these are the 'Black-Holes'.

7. 'Heisenberg Uncertainty Principle', 'Planck's Constant, h' and '2nd Law of Thermodynamics'

7.1 Planck's Constant and Entropy

The following relations are very much significant to understand what the Planck's constant h is

$$\text{Push forward} \times \text{distance} = \frac{4}{3} \pi r^2 \times r = \frac{4}{3} \pi r^3 \quad (\text{volume/energy})$$

$$(7.1.1)$$

$$\text{Push forward} \times \text{volume} = \frac{4}{3} \pi r^2 \times \frac{4}{3} \pi r^3 = \frac{16\pi^2 r^5}{9} \quad (\text{Acceleration})$$

$$(7.1.2)$$

$$\text{Pull back} \times \text{volume} = \frac{3}{4\pi r^2} \times \frac{4}{3} \pi r^3 = r \quad (\text{directional or unidirectional entropy}).$$

$$(7.1.3)$$

Heisenberg's uncertainty principle is simply related to the energy and pullback force. Keeping the pullback force constant, if one goes on increasing the energy, the volume increases and as a result randomness or delocalization per point mass increases or the uncertainty per particle increases. In such case the entropy (3r) goes on increasing and increasing (Eqn. 7.1.3)

If keeping the energy/volume constant, pull back is increased, the certainty or localization per point mass increases or the entropy goes on decreasing and decreasing. (Eqn.7.1.3)

Now the hybrid of pullback force and energy is equal to entropy 3r.

So, energy x pull back force or energy x time (Et)= mass x acceleration (Force) x distance x time

$$= \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^5}{9} \times r \times \frac{3}{4\pi r^2} = mvr = 3r \quad [\text{Since } mv = 3],$$

$$\text{Or, } Et = 3r \quad (7.1.4)$$

As the value of r is lesser and lesser mass become more and more. Delocalization or uncertainty per point mass is less.

As r increases and increases randomness or delocalization or uncertainty of per point mass becomes more and there is limiting value of r which delocalization, randomness or uncertainty reaches a maximum value. That limiting value of entropy (3r) is basically what Planck's constant h is.

Heisenberg's uncertainty principle in fact, is a correlation between de-localized states of point masses versus the degree of localization of energy to form point masses. In fact it expresses the hybridization of two opposing phenomena i.e., resultant of mass delocalization (energy) and degree of energy localization (time).

When we multiply energy (E) by time (t) to form a hybrid of the two

$$Et = 3r \quad (7.1.5)$$

When $r \rightarrow 0$ $E \rightarrow 0$ $m \rightarrow \infty$ $t \rightarrow \infty$
 When $r \rightarrow \infty$ $E \rightarrow \infty$ $m \rightarrow 0$ $t \rightarrow 0$

Energy is the resultant of mass delocalization and time in fact expresses the degree of localization of energy (pull back) to form point masses. Entropy, 3r or Planck's constant h is the hybrid of the above said two factors. The first factor tries to inflate matter and the second factor tries to squeeze it.

In matters of the universe the above two factors act in opposition to each other such that the net result is the uniform growth of matter over the 3 principle directions, resulting to 3r and we call it entropy.

Second Law of thermodynamics and Heisenberg's uncertainty principle carries the same physical significance that is to get work from energy one needs to generate entropy.

As shown in figure below (Fig.7.1.1a) for 2-dimensions

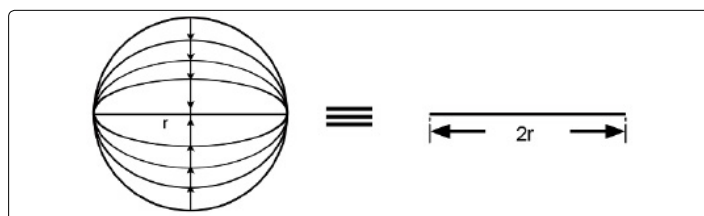


Figure 7.1.1a: Dimensional Energy- Time Hybrid Generating 1 dimension 'Directional Entropy' in one step

The two-dimensional time $\frac{1}{\pi r}$ acts on 2-dimensional energy ($2\pi r^2$) and it is being squeezed to a straight line with length 2r (the

2-dimensional unidirectional entropy or work).

In 3-dimension, the 3-dimensional time $\frac{3}{4\pi r^2}$ acts on 3-dimensional energy and it is being squeezed to form

$$\frac{3}{3\pi r^2} \times 4\pi r^3 = 3r \quad (7.1.6)$$

The circle as shown in Fig.7.1.1a above is a hybrid of two overlapping circles along the mutually perpendicular direction.

A sphere as shown below is a hybrid of the 3 circles (Fig.7.1.2)

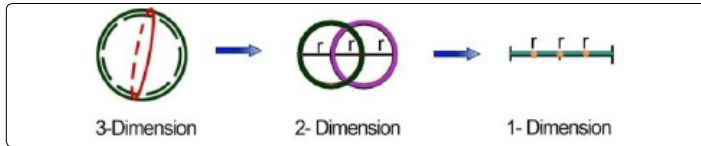


Figure 7.1.2: Three Dimensional Energy- Time Hybrid Generating 1 Dimensional Entropy in two Number of Steps by projection

The 3-dimensional figure takes a shape as shown in figure below when time (t) operates an energy (E) and pass onto 2-dimension. Now when pull-back forces continue operating on the above, as shown Fig.7.1.2 the result is the formation of a linear straight line.

The position, time, energy can be represented by circle as shown in Fig.7.1.3 below

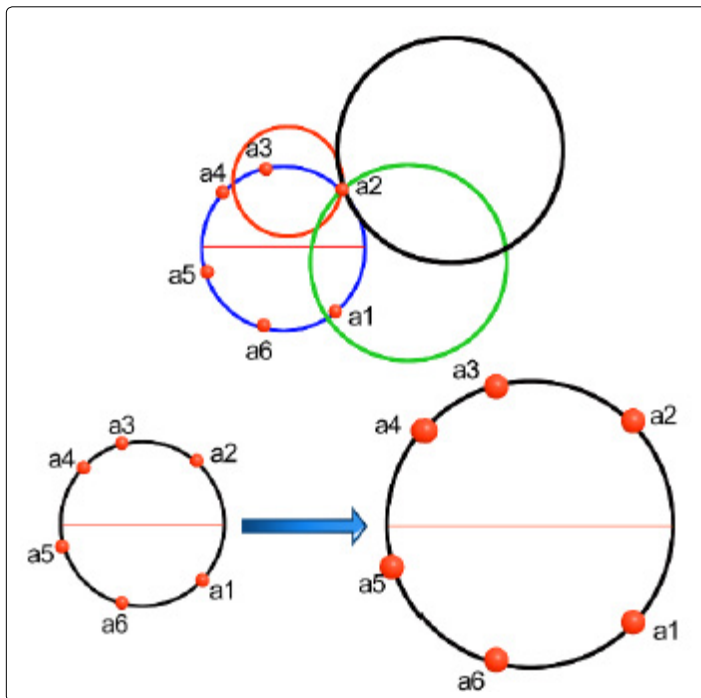


Figure 7.1.3: Position and Uncertainty

The different position of a point mass on the circumference of the circle is shown in Fig.7.1.3. As the radius of the circle increases, uncertainties of both energy (area) and position (location of the point mass on the circumference) increase.

Less the radius of the circle, the uncertainty of both energy and position are less.

If the area (energy) is fixed or made certain say Fig.7.1.3, the uncertainty in position remain (so many points $a_1, a_2, a_3, a_4, \dots$)

If the position is being made fixed or certain say a_2 in Fig.7.1.3, upper portion, (the different energy circles as shown around the same common point as shown in Fig.7.1.3), the uncertainty in energy is created as shown. Or the energy profile of the point mass become, uncertain. But in both the cases the entropy $2r$ offers a constant value.

So, uncertainty in energy x uncertainty in position = entropy.

Now higher the value of r, the time loop increases and the positional uncertainty becomes more and more.

So, uncertainty in energy x uncertainty in time = entropy = $3r$ (in 3-dimension).

The hybrid of the two (uncertainty in time and uncertainty in energy) is a result of multiplication of volume by reciprocal of area

Or, $\text{volume} \times \frac{1}{\text{area}} = \text{length or distance} \quad (7.1.7)$

Higher the masses, both uncertainty in and energy/volume decreases (See Fig.7.1.4)

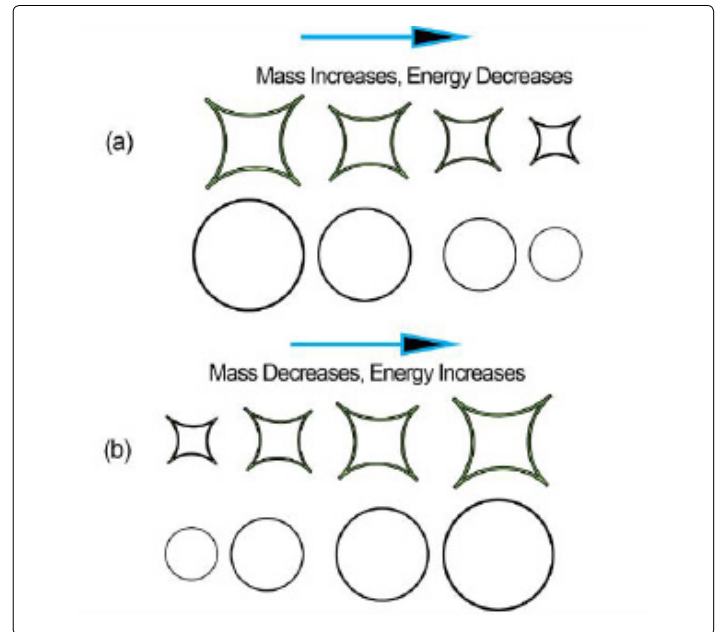


Figure 7.1.4: Pictorial Presentation of Mass- Energy Relationship

Higher the energy, the uncertainty in position and energy/volume increases.

So, Heisenberg's uncertainty principle is basically an order-disorder phenomena. Order (certainty) and disorder (uncertainty) in matter

balances the each other or the pullback force and push forward forces balance each other. As a result a matter attains an optimum spread overall the 3 principal directions in space and that is what entropy is.

If uncertainty in volume is more, the uncertainty in the position is more. Heisenberg's uncertainty principle can then simply be stated as

“The hybrid of uncertainty in position and uncertainty in energy/volume creates an uncertainty in distance (when uncertainty in position and energy both are in the increasing mode) and creates a certainty in distance too, when uncertainty in position and energy both are in the decreasing mode.

If the uncertainty in volume is made higher the uncertainty in position will be more, making the entropy or distance more or more uncertain.

If the uncertainty in volume (energy) is made lower, the uncertainty in position become lower, the uncertainty in distance or entropy decreases or entropy becomes more certain.

The second law of thermodynamics states heat cannot be completely converted into work and it makes the parameter “entropy” be responsible for that.

More the heat more is the randomness or positional entropy of the molecules. Now to convert heat into work, one has to design an engine (Carnot engine). An engine, takes heat from the surroundings, so energy is pumped into the system making the uncertainty in energy/volume more. Now during the back stroke of the engine the molecular attractive force (or time) operates on the molecules and the uncertainty in position decreases. During the said back stroke of the engine both the positional uncertainty and randomness decreases and as a result the certainty in distance or entropy (unidirectional) is generated. This generated unidirectional entropy drives the vehicle forward.

If heat could be completely converted into work all energies of the universe would have converted in a single point mass of infinite magnitude.

But the equivalence of mass-energy equation as proposed in this unified theory of the universe ($mE = 9$) reveals that it is impossible. In this equation ($mE = 9$), one cannot put $m=0$ or ∞ and $E=0$ or ∞ . So neither the mass can be fully converted into energy or the vice versa.

From the point of view of Heisenberg's uncertainty principle, if both position and volume or energy and time could have been fully ascertained simultaneously, the entire universe would have merged into a single point mass with energy, $E=0$ and that is, however, is not possible.

So, Heisenberg's uncertainty principle and second law of thermodynamics merge to the same horizon. “Neither energy can be fully converted into mass, nor, the mass can be fully converted into energy”.

Wave-Particle duality as depicted by de Broglie [5], is nothing but the mass-energy equi-valence or equivalence or equilibrium phenomena.

Mass and energy exists in equilibrium with each other. Now by applying push forward forces, mass gets converted to energy. On the contrary, by applying pull back forces the equilibrium shifts from energy to mass.

Both Heisenberg's uncertainty principle and second law of thermodynamics reveal that the existence of absolute zero of temperature can only be true, when both position and volume are certain.

This means that the universe had to merge to a single point. In a point, both volume and position or energy and time are fully ascertained simultaneously and that is being forbidden.

Einstein's famous equation $E = mc^2$ is not justified in the light of thermodynamics/Heisenberg's uncertainty principle.

First of all it is an irreversible type of equation without showing any equivalence of mass energy in the true sense. When one puts $m=0$, in this equation E turns out to be zero. But in reality, when $m \rightarrow 0$ or in vicinity of mass becoming vanishingly small, energy takes an enormous high value.

Moreover, one can put in this equation $m=0$ or infinity and E value 0 or infinity. Neither mass can be zero or infinity, nor, the energy can be zero or infinity. In the mass energy equivalence equation as proposed in this unified theory ($mE = 9$) putting value $m=0$ or ∞ and $E=0$ or ∞ are forbidden is not mathematically permitted.

Sum of multidirectional distances in 3 principal directions from the center of mass in space is multidirectional entropy (Fig.7.1.5)

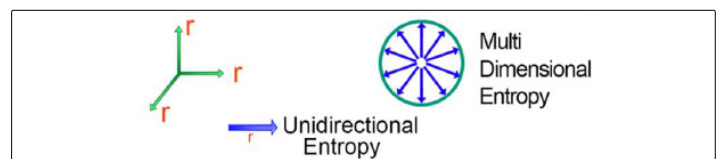


Figure 7.1.5: Representation of Unidirectional and Multidirectional Entropy

Sum of unidirectional distances the space in one dimension is work or order or unidirectional entropy

Hybrid of increasing uncertainty in position and increasing uncertainty in volume/energy certain the multidirectional entropy of the universe.

Hybrid of decreasing uncertainty in volume/energy and decreasing uncertainty the position certain work or order of the universe.

h = Planck's constant = proportionality constant of energy and temperature or push forward of force or delocalization of mass

= uncertainty in position x uncertainty in volume
 = value of multidirectional entropy when $m \rightarrow 0$
 = value of entropy when $E \rightarrow \infty$

$$\begin{aligned} \text{Energy} &= 4\pi r^3 \\ &= 3r \times \frac{4}{3} \pi r^2 \\ &= 3r \times \text{temperature} = 3r \times \text{push forward} \end{aligned} \quad (7.1.8)$$

Planck's length of energy-time equivalence equation
 = proportionality constant of localization of energy
 = uncertainty in position x uncertainty in volume (when both are at their minimum value)
 = value of entropy, when $m \rightarrow \infty$
 = value of entropy when $E \rightarrow 0$

$$E \times t = 4\pi r^3 \times \frac{3}{4\pi r^2} = 3r = \text{entropy} \quad (7.1.9)$$

Now as per Planck's law, $E = \text{Energy} = h\nu$

$$\nu = \text{frequency} = \frac{\text{cycles}}{\text{second}} \quad (7.1.10)$$

Now if there is say n nos. of cycles, n being an integer

$$\begin{aligned} \nu &= \frac{r}{\frac{3}{4\pi r^2}} \\ &= \frac{4\pi r^2}{3} \times r \end{aligned} \quad (7.1.11)$$

So, energy = $h \times n \times \frac{4\pi r^2}{3}$
 $= 3r \times n \times \frac{4\pi r^2}{3}$
 $= n \times 4\pi r^3$
 $= \text{integer} \times \text{entropy} \times \text{push forward} \quad (7.1.12)$

(f) The energy can also be represented in the following form in terms of time (t) and acceleration (f)

$$\begin{aligned} E &= 4\pi r^3 \\ &= 3 \times \frac{3}{4\pi r^2} \times \frac{16\pi^2 r^5}{9} \\ &= 3 \times t \times f \\ &= 3 \times \text{time} \times \text{acceleration} \end{aligned} \quad (7.1.13)$$

In the energy rich zone $f \gg t$ and $m \rightarrow 0$ and $E \rightarrow \infty$, the Planck's constant, $h (=3r)$ attains its maximum value.

In the mass rich zone $t \gg f$ and $m \rightarrow \infty$, $E \rightarrow 0$, the Planck's constant, $h (=3r)$ takes its minimum value below, Planck's length.

7.2 Mass Defect and Entropy

Mass-defect [6] is a result of generation of more uncertainty in distance arising out of increasing uncertainty in volume/energy and the increasing uncertainty in position. More uncertainty in distance can be described as a more certainty of multidirectional entropy. This is being shown in 2-dimension in the following figure (Fig. 7.2.2)

Here 2 nos of baryonic matter (radius r_1 and mass m_1) fuse to form a higher mass m_2 (radius r_2) (like say to melt and fuse to spherical metal balls to form a larger size sphere ball) as shown in Fig.7.2.2.

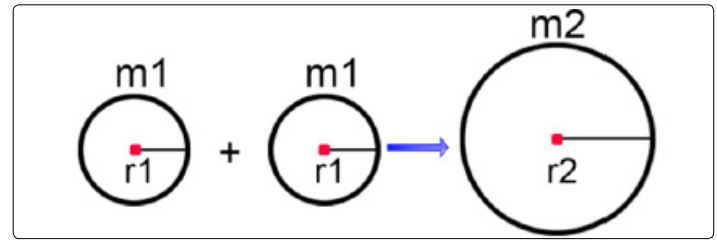


Figure 7.2.2: Fusion of two masses 'm1' to form a higher mass 'm2'

In such case both the uncertainty in energy/volume and position increases. These two higher uncertainties, are converted to higher multidirectional entropy.

$$\pi r_2^2 = \pi r_1^2 + \pi r_1^2 \quad (7.2.2)$$

$$\pi r_2^2 = 2\pi r_1^2 \quad (7.2.3)$$

$$\pi r_2^2 = 2r_1^2 \quad (7.2.4)$$

$$r_2 = \sqrt{2}r_1 \quad (7.2.5)$$

$$\text{Now, } 2\pi r_2^2 = \text{energy of mass } m_2 = 2\sqrt{2}\pi r_1^2 = 2\pi(\sqrt{2}r_1)^2 \quad (7.2.6)$$

So, the multidirectional entropy of mass m_2 becomes =

$$2\sqrt{2}r_1 = 2r_2 \quad (r_2 > r_1).$$

Since the entropy increases or the r value increases, the value of mass decreases $\left(m = \frac{9}{4\pi r^3}\right)$.

This reduction in the magnitude of mass (Δm) is being converted to energy, obeying the following mass-energy equivalence equation $mE = 9.00$

The mass-defect cannot be accounted for by using Albert Einstein equation $E = Mc^2$, since it does not make any sense either, truly. In Einstein's equation, mass has not been defined and so calculating energy by the said equation is fully arbitrary.

Based on the discussion in the preceding sections, one can conclude,

Work: Flow of Molecules in one Dimension, Directionally Generating Entropy or Work. Work is 1st Degree Entropy

Energy: Multidirectional movements of the molecules in 3-dimension generating disorder or randomness. energy is 3rd degree entropy while mass is inverse 3rd degree entropy.

7.3 Isothermal and Adiabatic Process and Carnot Engine

Thermodynamics, define the total energy, H of a system as

$$H = U + PV \quad (7.3.1)$$

Where U is the internal energy, P is the pressure, and V, the volume of the system. A 3-dimensional system as already described in Section 6, can be represented by a 2-dimensional diagram as under Fig.7.3.1

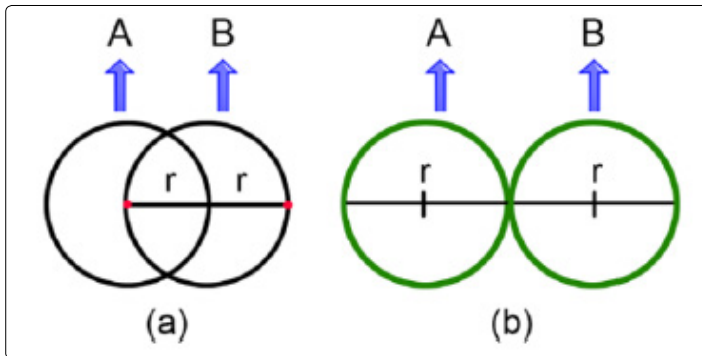


Figure 7.3.1: Representation of Enthalpy (H) in 2- dimension, internal energy (A) and pressure-volume (B)
(a) Integrated form, (b) Differential form

Now part A is formed by the overlapping of the 2 circles and is a very cohesive one and the molecules are tightly bound. The part A represents the internal energy U. The part B in fact is a pressure-volume (P-V) part.

In an isothermal process the temperature remains constant but the entropy increases. This can pictorially be represented as shown in figure (Fig.7.3.2)

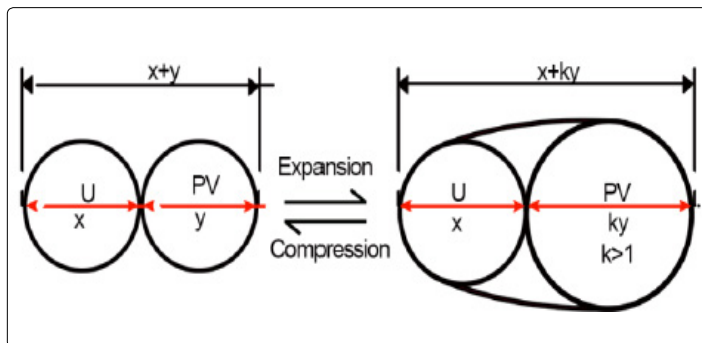


Figure 7.3.2: A typical Isothermal Expansion-Compression Process

So, during an isothermal expansion, the internal energy remains constant, but the P-V part increase. So the geometry of the system on an average, changes to an inhomogeneous ellipsoid, the diameter of the P-V part increases to ky from y ($k > 1$) but the diameter of the internal energy circle (U) remains x only. During an isothermal compression the ellipsoid returns back to its original shape (see Fig.7.3.2).

In an adiabatic expansion the entropy remains constant but the internal energy decreases as shown in Figure 7.3.3

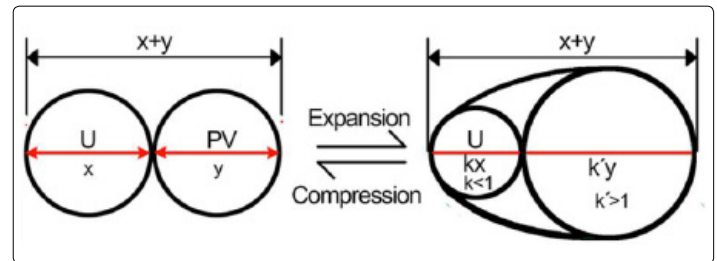


Figure 7.3.3: A typical Adiabatic Expansion- Compression Process

In an adiabatic expansion the entropy remains constant but the internal energy decreases as shown in Figure 7.3.3

As shown in figure 7.3.3, the volume of the part U decreases (diameter becomes kx from x , $k < 1$), but the volume of the part P-V increases (diameter becomes $k'y$, $k' > 1$). The shape of the P-V part becomes like a longitudinal ellipsoid, since a part of entropy from U part enters the P-V part directionally and which cannot create a very random geometry of the P-V part as in the case of an isothermal process, which is driven by taking heat from the surroundings. The total entropy of the system remains constant, such that $(x+y) = (kx + k'y)$. Whatever is the decrease in the radius of part U, directionally goes to the radius part of P-V. So the overall entropy remains constant.

During an adiabatic compression, the system is being returned to the original shape.

If a working substance in an engine is isothermally expanded at a certain temperature and is isothermally compressed back to the original state, no work can be generated, since the multi-directional entropy which is being gained during the expansion, is being multidirectional returned to the surroundings.

So, to extract out work or directional entropy from an engine, the only choice is to isothermally heat up the working substance to reach to a state of high positional and energy/volume uncertainty and then further expand adiabatically the working substance such that the P-V part gains a directional entropy from the internal energy part (while the total entropy remains constant).

Then upon isothermally compressing the system, the directional entropy gained, will come out to the surroundings 'as work'. The time, t (pull back forces during compression) acts on energy, E(or uncertainty) to form a Et hybrid and which results to entropy, r.

So, in fact an engine pumps out the integrals of Planck lengths from a system in a directional fashion. The entropy gravitons start flowing in a particular direction. Once this flow situation is established, the flow in fact drives the engine spontaneously cycles after cycles and the entropy graviton flow continues (Fig.7.3.4).

In the pictorial representation of Carnot Engine as shown in Figure 7.3.4, the following points to be noted:

In step 1 during the isothermal expansion, the entropy increases from (a + b) to (a+b+y).

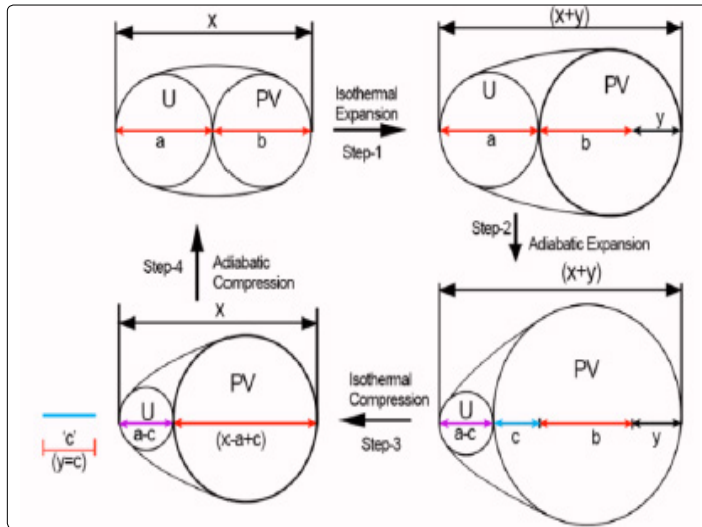


Figure 7.3.4: Presentation of a typical Carnot Engine (U= Intimal Energy, PV= Pressure- Volume), 'C (=Y), the generated Entropy in one cycle

In step 2, the total entropy remains constant, a length 'c' from U part enters the P-V part and the diameter of U part becomes 'a-c'

while the diameter of the P-V part becomes 'c+b+y' but its shape becomes ellipsoid type.

In step 3, which is most vital step of Carnot engine (generation of unidirectional entropy, 'y=c'), the isothermal compression leads to a decrease in volume, but the directional entropy 'c' is pumped out of the system as work as shown in figure 7.3.4. The entropy of the P-V part returns to original magnitude of (b+y) = (x - a +c). The following equations hold true for the Carnot engine schematic as shown in the Figure 7.3.4 :

$$x = (a + b), (x+y) = (a + b + y), (x-a+c) = (b + y)$$

In step 4, the adiabatic compression, the U part increases to the original and the P-V part decreases to the original volume and the total entropy remains the same (x). The multidirectional entropy gained in step 1 is being unidirectional returned to the surroundings as 'work'.

When one says that 'Carnot engine' is based on the '2nd law of thermodynamics' and this is equivalent saying 'Carnot engine' is based on 'Heisenberg uncertainty principle too'.

So, the second law of Thermodynamics and Heisenberg's uncertainty principle merge with each other and basically are the same.

8. Convergence of Planck'S Units and the Units Derived from the Unified QG Theory

Max Planck had derived the following five nos. of micro units and those are linked to the Gravitational Constant, G [7]

Table 8.1: Expressions of Planck units of length, mass, time, charge and temperature

Sl. No.	Name of the variable	Dimension	Expression
1	Planck Length	Length (L)	$l_p = \sqrt{\frac{\hbar G}{c^3}}$
2	Planck Mass	Mass (M)	$m_p = \sqrt{\frac{\hbar c}{G}}$
3	Planck Time	Time (T)	$t_p = \sqrt{\frac{\hbar G}{c^5}}$
4	Planck Charge	Electric Charge (Q)	$q_p = \sqrt{4\pi\epsilon_0 \hbar c}$
5	Planck Temperature	Temperature (θ)	$T_p = \sqrt{\frac{\hbar c^5}{G k_B^2}}$

Where,

\hbar is the reduced Planck's constant = $h/2\pi$

c is the velocity of the light

G is the gravitational constant Newton

ϵ_0 is the permittivity of the free space

k_B is the Boltzmann constant

It will be shown that by putting the dimension/units of the following variables (as proposed in the unified theory)

Planck's constant h ,

Gravitational constant G

Velocity of the light c

Permittivity of the free space ϵ_0

Boltzmann constant k_B

In Planck equation as given in Table 8.1 for Planck length, Planck mass, Planck time, Planck charge and Planck temperature, respectively, we get the same expression for the said physical variables as directly derived from this unified theory.

The units and dimension of G , \hbar , k_B and c as derived in the unified theory are:

$$G = \frac{nf^2}{4\pi} \quad (n = \text{integer and } f = \text{acceleration}) \quad (8.1)$$

$$h = 3r \quad (8.2)$$

$$k_B = (PV/NT) = r \quad (N = \text{Avogadro number, } P=1) \quad (8.3)$$

$$c = \frac{4}{3}\pi r^3 \quad (8.4)$$

Now we proceed to put the above mentioned units in Planck equations (Table 8.1)

$$\text{Planck length} = \ell_p = \sqrt{\frac{\hbar G}{c^3}} = \sqrt{\frac{\text{entropy} \times (\text{acceleration})^2 \times n}{2\pi \times 4\pi \times (\text{volume})^3}} \quad (8.5)$$

Now, (entropy x acceleration) =

$$3r \times \frac{16\pi^2 r^5}{9} = 3 \times \left(\frac{4}{3}\pi r^3\right)^2 = 3 \times (\text{volume})^2 \quad (8.6)$$

So the above equation (Eq.8.5) becomes

$$\sqrt{\frac{3 \times (\text{volume})^2 \times \text{acceleration} \times n}{4\pi \times (\text{volume})^3 \times 2\pi}} = \sqrt{\frac{3 \times \text{acceleration} \times n}{4\pi \times \text{volume} \times 2\pi}} \quad (8.7)$$

Now, acceleration/volume

$$= \frac{16\pi^2 r^5}{9} = \frac{16\pi^2 r^5}{9} \times \frac{3}{r\pi r^3} = \frac{2\pi r^2}{3} \quad (8.8)$$

So, the above expression 8.7 becomes

$$\sqrt{\frac{3}{4\pi} \cdot \frac{4\pi r^2}{3} \times \frac{1}{2\pi} \times n} = \sqrt{\frac{n}{2\pi}} \cdot \sqrt{r^2} = \sqrt{\frac{n}{2\pi}} \cdot r \quad (8.9)$$

So, Planck length is r , as shown already in the unified theory.

$$\text{Now, Planck Mass } m_p = \sqrt{\frac{\hbar c}{G}} = \sqrt{\frac{\text{entropy} \times \text{volume} \times 4\pi}{2\pi \times (\text{acceleration})^2 \times n}} \quad (8.10)$$

$$\text{Now, } \frac{\text{entropy}}{\text{acceleration}} = \frac{3r}{\frac{16\pi^2 r}{9}} = 3r \times \frac{9}{16\pi^2 r^5}$$

$$3r \times \frac{9}{16\pi^2 r^5} = \frac{27}{16\pi^2 r^4} \quad (8.11)$$

$$\text{Now, } \frac{\text{entropy}}{(\text{acceleration})^2} = \frac{27}{16\pi^2 r^4} \times \frac{9}{16\pi^2 r^5} = \frac{3^5}{256} \cdot \frac{1}{\pi^4 \cdot r^2} \quad (8.12)$$

So the above expression 8.10 becomes

$$\sqrt{\frac{3^5}{256} \cdot \frac{1}{\pi^4 \cdot r^9} \times \frac{2}{n} \times \frac{4}{3} \pi r^3} \quad (8.13)$$

$$= \sqrt{\frac{3^4 \times 2 \times 4}{256 \times n} \cdot \frac{1}{\pi^3 \cdot r^6}} = \sqrt{\frac{3^4}{32 \times n \pi} \times \frac{1}{\pi^2 \cdot r^6}} =$$

$$\sqrt{\frac{3^4}{2n\pi} \times \frac{1}{16\pi^2 r^6}} = \sqrt{\frac{1}{2n\pi} \times \frac{9}{4\pi r^3}} \quad (8.14)$$

The unified theory has directly defined mass $\frac{9}{4\pi r^3}$.

The Planck mass is found to be a multiple of the one derived by the unified theory. Dimensionally both are the same.

Now, Planck time =

$$\sqrt{\frac{\hbar G}{C^5}} = \sqrt{\frac{\text{entropy} \times \text{nx} \text{ (acceleration)}^2}{2\pi x \ 4\pi x \text{ (volume)}^5}} \quad (8.15)$$

Now, $(\text{acceleration})^2 = \left(\frac{16\pi^2 r^5}{9}\right)^2 = \left(\frac{256}{81}\right) x \pi^4 r^{10}$ (8.16)

$$(\text{volume})^5 = \left(\frac{4}{3}\pi r^3\right)^5 = \frac{4 \times 256}{81 \times 3} \cdot \pi^5 r^{15} \quad (8.17)$$

The expression 8.15, Planck time becomes

$$\text{So, } \frac{(\text{acceleration})^2}{(\text{volume})^5} = \frac{256}{81} \cdot \pi^4 4^{10} x \frac{81 \times 3}{4 \times 256 \times \pi^5 r^{15}} = \frac{3}{4\pi^5 r^5} \quad (8.18)$$

The expression 8.15, Planck time becomes

$$= \sqrt{\frac{\text{entropy} \times \text{nx}}{2\pi x 4\pi} \cdot \frac{3}{4\pi r^5}} = \sqrt{\frac{3r \text{ nx} \ 3}{32\pi^3 r^5}} = \sqrt{\frac{n}{2\pi} x \frac{9}{16\pi^2 r^4}} = \sqrt{\frac{n}{2\pi} x \frac{3}{4\pi r^2}} \quad (8.19)$$

So again the Planck time is found to be a multiple of the unified theory derived definition of time, both being dimensionally equivalent.

Now, Planck temperature =

$$T_p = \sqrt{\frac{\hbar c^5}{G \cdot k_B^2}} = \sqrt{\frac{\text{entropy} \times \text{nx} \text{ (volume)}^5 4\pi}{2\pi \text{nx} \text{ (acceleration)}^2 x (r)^2}} \quad (8.20)$$

Now, $(\text{volume})^5 / (\text{acceleration})^2$ has already been found to be..

So, the above expression 8.20 becomes

$$\sqrt{\frac{3rx \ 4\pi r^5 4n}{3x \ 2n\pi x \ r^2} x \frac{1}{9}} = \sqrt{\frac{16\pi r^6}{2nx \ 9}} = \frac{\sqrt{\pi}}{\sqrt{2n}} x \frac{4r^2}{3} = \frac{1}{\sqrt{2n\pi}} \cdot \frac{4\pi r^2}{3} \quad (8.21)$$

So, the time and temperature are just multiplicative inverse to each other, is concluded from both the unified theory and the Planck's theory.

Now regarding the electric charge, Planck had used the form of electric charge as per SI unit and which is Coulomb (C). The CGS system uses the length, mass and time only to define the electric charge and the electric charge is defined as stat – C.

The inter-relation between Coulomb (C) and stat-C is [8], C corresponds to 3×10^9 state-C

However, Coulomb (C) and stat-C are dimensionally different too. Logically, that state-C is the most fundamental and is true representation of electric charge in term of mass, length and time. So, in this article, we will be using stat-C as the unit of electric charge.

Now we will show that when the true dimensions of 'mass' and 'time' are put in the dimensional expression of the physical variables of the universe, we really land up to a situation of real unification of one set of physical variables to the other set of physical variables, which are usually considered to be different. Also, the proper understanding of the significances of the physical variables is being made possible.

Planck had put forward the mother dimensional expressions for the physical variables. We will be showing in the subsequent section, and show how the physical variables are related to each other logically and conceptually. When we use the unified theory to analyze them, and also can understand why this is being called a unified theory.

The dimension of electric charge at per Columbus' law [9] is $= L^{3/2} M^{1/2} T^{-1}$. (Length)^{3/2} (Mass)^{1/2} and (1/Time). As the dimension of mass and time are put, we get the dimension of electric charge

$$= r^{3/2} \cdot \left(\frac{9}{4\pi r^3}\right)^{1/2} \cdot \frac{4\pi r^2}{3} = r^{\frac{3}{2}} \cdot \frac{3}{2\pi^{\frac{1}{2}} r^{\frac{3}{2}}} \cdot \frac{4\pi r^2}{3} = 2\sqrt{\pi} r^2 \quad (8.22)$$

Planck charge of q_p has been defined as

$$= \sqrt{4\pi\epsilon_0 \cdot \hbar c} \quad (8.23)$$

c is the speed of light

ϵ_0 permittivity of the free space

\hbar reduced Planck constant

Now permittivity is dimensionless (is shown later) and the dimensionally the above equation 8.23 can be written as

$$= \sqrt{4\pi x \frac{3r}{2\pi} \cdot \left(\frac{4\pi}{3}\right) r^3} = \sqrt{8\pi \cdot r^4} = 2\sqrt{2\pi} r^2 \quad (8.24)$$

So, equations (8.22) and (8.24) all are dimensionally the same.

Table 8.2: Derivation of the QG units of physical variables, from fundamental dimensional equations, of the physical variables in classical physics [10].

Sl. No.	NAME	PLANCK DIMENSION	BREAK UP OF PLANCK DIMENSION TO UNIFIED THEORY DIMENSION	UNIFIED THEORY DIMENSION AND ITS SIGNIFICANCE
1.	Planck Area	L^2	-	r^2
2.	Planck Volume	L^3	-	r^3 or $\frac{4}{3}\pi r^3$
3.	Planck Momentum	LMT^{-1}	$r \times \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3}$	3
4.	Planck energy	L^2MT^{-2}	$r^2 \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9}$	$4\pi^3$
5.	Planck Force	LMT^{-2}	$r \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9}$	$4\pi^2$
6.	Planck Power	L^2MT^{-3}	$r^2 \times \frac{9}{4\pi r^3} \times \frac{64\pi^3 r^6}{27}$	$\frac{16\pi^2 r^5}{3}$ ACCELERATION
7.	Planck density	$L^{-3}M$	$\frac{1}{r^3} \times \frac{4\pi r^3}{9}$	$\frac{16\pi}{V^2}$ INVERSE OF THE SQUARE OF VOLUME
8.	Planck energy density	$L^{-1}MT^{-2}$	$\frac{1}{r} \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9}$	4π DIMENSIONLESS
9.	Planck intensity	MT^{-3}	$\frac{9}{4\pi r^3} \times \frac{64\pi^3 r^6}{27}$	$4\pi v$ VOLUME/ENERGY
10.	Planck angular frequency	T^{-1}	$\frac{4\pi r^2}{3}$	$\frac{4\pi r^2}{3}$ FORCE/TEMPERATURE
11.	Planck Pressure	$L^{-1}MT^{-2}$	$\frac{1}{r} \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9}$	4π DIMENSIONLESS
12.	Planck Current	$T^{-1}.Q$	$\frac{4}{3}\pi r^2 \times 2\sqrt{\pi} r^2$	$\frac{3}{2\sqrt{\pi}} \left(\frac{4\pi r^2}{3}\right)^2$ SQUARE OF FORCE/TEMPERATURE
13.	Planck Voltage	$L^2MT^{-2}Q^{-1}$	$r^2 \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9} \cdot \frac{1}{2\sqrt{\pi} r^2}$	$4\sqrt{\pi} r$ ENTROPY/DISTANCE

14.	Planck electric flux	$MT^{-2}Q L^3$	$r^3 \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9} \cdot 2\sqrt{\pi} r^2$	$\frac{1}{2\sqrt{\pi}} (4\pi r^3)^2$ $= \frac{1}{2\sqrt{\pi}} E^2$ SQUARE OF ENERGY
15.	Planck impedance	$L^3 MT^{-1} Q^{-2}$	$r^2 \times \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \cdot \frac{1}{4\pi r^4}$	$\frac{3}{4\pi r^3} = \frac{3}{E} = \frac{M}{3}$ INVERSE ENERGY OR MASS
16.	Planck magnetic induction	$MT^{-1} Q^{-1}$	$\frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \cdot \frac{1}{2\sqrt{\pi} r^2}$	$\frac{6}{\sqrt{\pi}} = \frac{1}{E}$
17.	electrical field strength	$LMT^{-2} Q$	$r \times \frac{9}{4\pi r^3} \times \frac{16\pi^2 r^4}{9} \cdot 2\sqrt{\pi} r^2$	$4\pi r^4 = \frac{1}{4\pi} (4\pi r^2)^2$ SQUARE OF FORCE/TEMPERATURE
18.	Planck Magnetic flux	$L^2 MT^{-1} Q^{-1}$	$r^2 \times \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \times \frac{1}{2\sqrt{\pi} r}$	$\frac{3}{2\sqrt{\pi} r}$ INVERSE ENTROPY
19.	Planck electrical inductance	$L^2 MQ^{-2}$	$r^2 \times \frac{9}{4\pi r^3} \times \frac{1}{4\pi r^2}$	$\frac{9}{16\pi^2 r^5} = \frac{1}{f}$ INVERSE ACCELERATION
20.	Planck Magnetic charge	$L \cdot T^{-1} Q$	$r \times \frac{4\pi r^2}{3} \times 2\sqrt{\pi} r^2$	$\frac{9}{2\sqrt{\pi}} \cdot \frac{16\pi^2 r^5}{9} = \frac{9}{2\sqrt{\pi}} \cdot f$ ACCELERATION
21.	Planck volumetric flow rate	$L^3 T^{-1}$	$r^3 \times \frac{4\pi r^2}{3} = \frac{3}{4\pi} \times \frac{16\pi^2 r^5}{9}$	$\frac{3}{4\pi} \cdot f$ ACCELERATION
22.	Planck viscosity	$L^{-1} MT^{-1}$	$\frac{1}{r} \times \frac{9}{4\pi r^3} \cdot \frac{4\pi r^2}{3}$	$4\pi \cdot \frac{3}{4\pi r^2} = 4\pi \cdot t$ TIME/PULL-BACK FORCE
23.	Planck acceleration	LT^{-2}	$r \times \frac{16\pi^2 r^4}{9} = \frac{16\pi^2 r^5}{9}$	f
24.	Planck magnetic potential	$LMT^{-1} Q^{-1}$	$r \times \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \cdot \frac{1}{\sqrt{2\pi} r^2}$	$2\sqrt{\pi} \cdot \frac{3}{4\pi r^2} = 2\sqrt{\pi} t$ TIME/PULL-BACK FORCE
25.	Planck Magnetic dipole	$L^2 T^{-1} Q$	$r^2 \times \frac{4\pi r^2}{3} \times 2\sqrt{\pi} r^2$	$\frac{1}{6\sqrt{\pi}} \cdot E^2$ SQUARE OF ENERGY
26.	Planck Magnetic displacement	$L^{-1} T^{-1} Q$	$\frac{1}{r} \times \frac{4\pi r^2}{3} \cdot 2\sqrt{\pi} r^2$	$2\sqrt{\pi} x V$ VOLUME

27.	Planck current density	$L^{-2}T^{-1}Q$	$\frac{1}{r^2} \cdot \frac{4\pi r^2}{3} \cdot 2\sqrt{\pi} r^2$ $= 2\sqrt{\pi} \frac{4\pi r^2}{3}$	$2\sqrt{\pi} \times \text{TEMPERATURE}$
28.	Planck Permeability	$LMT^{-2}A^{-2}$ A= Ampere	Explained below	Explained below
29.	Planck electric dipole	LQ	$r \times 2\sqrt{\pi} r^2$	$2\sqrt{\pi} r^3 = \frac{1}{2\sqrt{\pi}} 4\pi r^3 = \frac{E}{2\sqrt{\pi}}$ ENERGY
30.	Planck electric induction	$L^{-2}Q$	$\frac{1}{r^2} \cdot 2\sqrt{\pi} \cdot r^2 = 2\sqrt{\pi}$	$2\sqrt{\pi}$ DIMENSIONLESS
31.	Planck permittivity	$L^{-3}M^{-1}T^2Q^2$	$\frac{1}{r^3} x \frac{4\pi r^3}{9} x \frac{9}{16\pi^2 r^4} x 4\pi r^4$	1 DIMENSIONLESS
32.	Planck conductance	$L^{-2}M^{-1}TQ^2$	$\frac{1}{r^2} x \frac{4\pi r^3}{9} x \frac{3}{4\pi r^2} \cdot 4\pi r^4$	$\frac{4\pi r^3}{3} = V_{\text{VOLUME}}$
33.	Planck conductivity	$L^{-3}M^{-1}Q^2T$	$\frac{1}{r^3} x \frac{4\pi r^3}{9} \cdot 4\pi r^4 x \frac{3}{4\pi r^2}$	$\frac{1}{3} \left(\frac{4\pi r^2}{3} \right) = \frac{1}{3} (\text{temperature})$ $= \frac{1}{3} (\text{force})$

N.B. In the above Table 8.2, V stands for volume, t stands for time, E stands for energy, Q stands for electrical charge, f stands for acceleration

8.1 Understanding of the Physical Variables as per Classical Theory in the Light of QG Theory and the Unification of the Physical Variables as Different Clusters

Before doing the logical analysis of the dimension of the several physical variables in accordance with the unified theory, it should be noted that for any variable x, when it is said per unit time of x, i.e., x/t, the dimension of the variable is going to be multiplied by a dimension of circle (time is a pullback inverse circle) and as a result the variable turns into some other variable. For energy volume flow rate per unit of time (conventional) and that can be written as

$$= \left(\frac{4}{3} \pi r^3 \right) / \left(\frac{3}{4\pi r^2} \right) = \frac{16\pi^2 r^5}{9} = \text{acceleration} = \mathbf{f}.$$

The variable, as a matter of fact has to pass through the pullback inverse circle to overcome it and hence its dimension gets multiplied with r^2 .

On the contrary when a variable say x is being multiplied with time, the pullback force extracts out an inverse square plane from the variable. So the dimension of the variable x gets divided by r^2 . For example, energy (E) being multiplied with time (t). Energy being a 3 dimensional variable, has to give off a circle (r^2) and as a result, one will be left with a distance, r.

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

Table 8.1.1. The physical concept of the dimensions of the physical variables as obtained from the unification of Planck theory and the QG theory

Name of the Physical Variable	Dimension in Accordance with the QG Theory	Physical Concept
Momentum Energy	3 $4\pi r^3$	<p>Mass and volume bears an inverse relationship to each other, in the multiplicative sense and momentum is a hybrid of push forward energy and pull back energy, as shown below</p> $m \times v = \frac{9}{4\pi r^3} \times \frac{4}{3} \pi r^3$ $= \left(\frac{3}{4\pi r^2} \times \frac{3}{r} \right) \times \left(4\pi r^2 \times \frac{r}{3} \right) \quad (a)$ <p>= (time x order) x (push forward force x depth of matter)</p>
Intensity Electric dipole Conductance	Volume/energy πr^3	<p>Intensity [12] by definition is the power passing through a unit surface area unit time. This is equivalent saying energy passing per unit area, per unit time. For any variable per unit time means its dimension gets multiplied with a square plane.</p> $\text{Intensity} = \text{MT}^{-3} = \frac{\text{POWER}}{\text{m}^2} = \frac{\text{ENERGY}}{\text{sec.M}^2} = \frac{\text{MLT}^{-2} \text{L}}{\text{t}^2}$ $= \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \times \frac{4\pi r^2}{3} \times \frac{4\pi r^2}{3} = \frac{9}{4\pi r^3} \times \frac{16r^5}{9} \times \frac{4\pi r}{3}$ <p>= Mass x acceleration x distance = Force x distance = energy or volume.</p> <p>An electric dipole is a hybrid of charge and distance of separation of charge. Charge has a dimension of a square and when it gets multiplied with a distance, it attains the dimension of volume energy.</p> <p>In case of conductance, a charged species or ion moves in a 3-dimensional space, so it is encroaching a volume. So it is dimensionally volume or energy.</p>
Energy density Electric induction permittivity pressure	Dimensionless	<p>Electric induction by definition is the generation of an electromotive force in a conductor under the condition of a changing magnetic field. Basically it is the ratio of two magnetic fields (one the initial and the other, the charged one) and hence is dimensionless. In one condition of a magnetic field, the average intermolecular distances have a certain value. In a changed magnetic field position, however the intermolecular distance attains another value. So basically it is the ratio of two intermolecular distances and hence electric induction is dimensionless. Energy density is also a ratio of two dimensionally same variables, i.e., energy and volume. So it is also dimensionless. Pressure as shown already in this article, is a product of pull back force and push forward force, one having the inverse dimension of the other and hence is dimensionless. Permittivity in fact is the resistance offered by a material for the passage of the electric field through it. Electric field being the energy (E) and the resistance is mass (m), the hybrid of two is a dimensionless parameter, since energy and mass are dimensionally inverse to each other.</p>

Current Electric field strength	(Area) ² or (Force) ² or (4πr ²) ²	<p>Electric charge is a surface phenomenon. An electric charge is created on a surface due to friction, or absorption/adsorption phenomena and hence has a dimension of an area. The current having the dimension of charge per unit time means, a charge has to pass through a pull-back square plane to overcome it and is dimensionally a hybrid of two areas and hence is 4- dimensional. The electric field strength dimension is</p> $LMT^{-2}Q = r \times \frac{9}{4\pi r^3} \times \frac{4\pi r^2}{3} \times \frac{4\pi r^2}{3} \times Q = \frac{16\pi^2 r^5}{9} \times \frac{9}{4\pi r^3} \times Q$ <p>= mass x acceleration x charge = Force x charge.</p> <p>So electric field strength is also a hybrid of two areas and hence is 4-dimensional.</p>
Angular frequency Current density conductivity	Force or Area $\frac{4\pi r^2}{3}$	<p>Electric current is a 4-dimensional variable and current density is 2-dimensional. The reason is the current density is the amount of current passing through a unit cross sectional area. So it is by definition is 2- dimensional since cross sectional area is also 2- dimensional.</p> <p>Angular frequency is a phenomenon of circular motion, no. of cycles per unit time. Since the number of cycles has no dimension, it becomes 2-dimensional for obvious reasons of pull back time phenomena. Conductivity in contrast to resistivity is a push forward phenomenon and hence is 2-dimensional.</p>
Electric flux	(E)	<p>An electric flux is a hybrid of the following 3 physical variables.</p> <p>Electric field x distance x area.</p> <p>It is basically defined as the passage of an electric field through an area. So the electric field has to move a distance and pass through an area. Electric field is dimensionless and so electric flux has a dimensionality of distance x area = r x r² = r³.</p>
Resistance or Impedance	Mass, $\frac{9}{4\pi r^3}$	<p>Impedance (in case of alternating current) or resistance (in case of direct current) is a hybrid of pull back force and order . The pullback force resists any charged species to move forward through a substance. Cohesiveness of the molecules of the materials is also trying to retain the degree of order of the substance. So resistance is a multiplicative effect of the two :</p> <p>Index of order $\rightarrow \frac{3}{r}$</p> <p>Index of pull back force or time $\rightarrow \frac{3}{4\pi r^2}$.</p> <p>So the product of the two is</p> $\frac{3}{r} \times \frac{3}{4\pi r^2} = \frac{9}{4\pi r^3} = mass = order \times resistivity.$ <p>The above logical analysis establishes that the dimension of resistance is mass.</p>

<p>Voltage, Capacitance, and Entropy</p>	<p>All are distance or length 'r'</p>	<p>Voltage or potential difference is a hybrid of current and resistance or impedance</p> <p>Voltage = Current \times Resistance</p> <p>Now resistance has a dimension of mass (as already explained) and whenever it is forming a hybrid with 4-dimensional variable, electric current, the result is a one dimension variable, which is distance or length or intermolecular distance. Flow of charges is being stopped by masses, so the masses getting thrusts; either comes closer to each other or moves away from each other. So the outburst of voltage is turned into one dimension.</p> <p>Capacitance is the capacity of a substance to store electric charge. It is also related to the distance. Higher the intermolecular distance, a capacitor can store more energy and if the intermolecular distance is less, the stored energy will also be less. So, for obvious reason, capacitance is one-dimensional. Entropy has already been explained in this article.</p>
<p>Resistivity, Magnetic potential Viscosity</p>	<p>$\frac{3}{4\pi r^2}$</p>	<p>Resistivity has already been shown to have a dimension of time, or pull back or $3/(4\pi r^2)$</p> <p>Viscosity is the resistance to flow. The forward moving molecules of a fluid are being pulled back by the other molecules; as a result, the flow is hindered or retarded. So viscosity is purely a pullback phenomenon and has a dimension of time.</p> <p>Magnets attract molecules towards itself. So magnetic potential is basically a pullback phenomenon and has the same dimension as that of time.</p> <p>Magnetic potential is</p> $LMT^{-1}Q^{-1} = r \times \frac{9}{4\pi r^3} \times \frac{\pi r^2}{3} \cdot Q^{-1} = 3 \times Q^{-1} = \frac{3}{Q}$ <p>So magnetic potential is an inverse of electric charge or an inverse of current density.</p> <p>Electric charge and magnetic potential [13] are physical variables analogous to mass and volume/energy, being a sort of multiplicative inverse to each other. Higher the magnetic potential (M_p), lower would be the electric charge (Q) and they always exist in equilibrium to each other, such that</p> $M_p Q = 3.00$ <p>As the. Magnetic potential increases, due to the pullback attraction, the r value decreases, or the surface area decreases. Since electric charge is directly linked to surface area, the magnitude of electric charge decreases. Magnetic potential like Gravitation is a space inversion phenomenon.</p>

Inductance	<p>Inverse Acceleration</p> <p>or</p> $\frac{1}{f} = \frac{9}{16\pi^2 r^5}$	<p>By definition, inductance [14] is originated from the change in electric current which induces a back or opposing electromotive force (emf). While acceleration leads to expansion, inductance is a reverse acceleration and which is a squeezing phenomenon. Acceleration is</p> $\left(\frac{Force}{Mass}\right) = \left(4\pi r^2 x \frac{4\pi r^3}{9}\right)$ <p>So force inverses the pull back or mass. In case of inverse acceleration, mass is acted by reverse of force.</p>
		<p>So inverse of acceleration</p> $= \left(\frac{Mass}{Force}\right) = \frac{9}{4\pi r^3} x \frac{1}{4\pi r^2}.$ <p>So inductance is 1st degree inverse acceleration and gravitation is second degree inverse acceleration and is</p> $= \frac{1}{f^2}.$ <p>It is equivalent to saying that inductance is the hybrid of electric current and inverse voltage (elastance). So it dimensionally comes out to be</p> $\frac{3}{2\sqrt{\pi}} \left(\frac{4\pi r^2}{3}\right)^2 x \frac{1}{4\sqrt{\pi r}} = \frac{9}{16\pi^2 r^5} \cdot \frac{1}{6}$ <p>It should not be confused with retardation. In case of retardation the overall direction of movement of molecules remain the same, but the molecules are slowed down. In case of inverse acceleration, the direction of growth reverses. Retardation is a subtractive inverse of acceleration while inverse of acceleration is a multiplicative inverse.</p>
Permeability	$\frac{4\pi}{r^6}$	<p>Permeability [15] is the ability of the material to allow magnetic lines of force to pass through it. So it is basically an attractive phenomenon. Higher the attractive force, higher would be the Permeability. The dimension of permeability</p> $= \text{NEWTON}/(\text{Amp})^2 = \text{LMT}^{-2}\text{A}^{-2}$ $= r x \frac{9}{4\pi r^3} x \frac{16\pi^2 r^4}{9} x \frac{1}{r^8} = \frac{r^3 \pi^2 x 16}{16\pi^2 r^5} = \frac{4\pi}{r^6}$ <p>Basically it is a squeezing magnetic field, passing through a material due to the pullback force. So permeability is a hybrid of squeezing or inverse magnetic field and pull back force =</p> $\frac{1}{r^4} x \frac{1}{r^2} = \frac{1}{r^6}$ <p>Energy or the magnetic field is being pulled back and is forced to pass through the material.</p>

8.2 Time and Growth of the Universe

This article needs some more discussion on the variable ‘time’. The conventional time which is followed world-wide is not the true time, it is simply a distance. For practical, day to day running of the activities of the world, this can be adhered to, but when it comes to the question of in-depth-understanding of cosmology, what the universe is, the unified theory defined time is the only answer.

Suppose at any instance, a group of people enter a room and start a meeting and however, the group leaves the room after the meeting is over. The duration of the meeting should be defined as, how much the pull-back force of the expanding universe has diminished during the duration of the meeting.

If the average radius of the universe would have been r^1 , when the meeting had started, and r^2 be the value when that meeting had ended, then duration of the meeting would be measured by (tm)

$$t_m = \frac{3}{4\pi r_1^2} - \frac{3}{4\pi r_2^2} = 3 \left(\frac{1}{4\pi r_1^2} - \frac{1}{4\pi r_2^2} \right) \quad (8.2.1)$$

Please find in figure 8.2.1, the pattern of the change of time (t) as a function of intermolecular distance, r. The distance r has been arbitrarily considered to be in the range of 1 - 10. The conventional thought of human society is that the time is increasing and increasing, but the cosmology truth is just diametrically opposite. The store of time was almost “infinite” at the instant of the birth of the universe and it is decreasing and decreasing with the growth of the universe in an exponential fashion as shown in figure 8.2.1

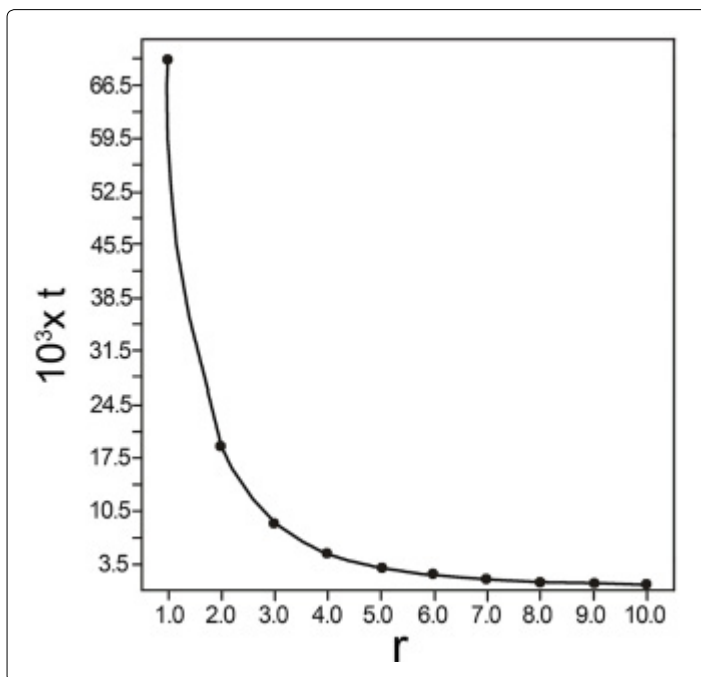


Figure 8.2.1: ‘t’ versus ‘r’ curve

Baryonic growing matters are in fact the hybrid of three variables, i.e., entropy, energy and time.

So, energy x entropy x time

$$= 4\pi r^3 \times 3r \times \frac{3}{4\pi r^2} = 9r^2 = \frac{27}{4\pi} \cdot \frac{4\pi r^2}{3} = \frac{27}{4\pi} \times (\text{push forward}) \quad (8.2.2)$$

So as per equation 8.2.2 it is a “push forward” $\left(\frac{4\pi r^2}{3}\right)$ effect of temperature phenomena and the matter grows. Now at the extreme end of mass-energy equivalence when $t \rightarrow \infty$, entropy becomes exceedingly small and the dimension of matter is controlled by the hybrid of energy and time. The time pulls back the energy and the dimension is transferred to 1-dimension, r

$$\text{energy} \times \text{time} = 4\pi r^3 \times \frac{3}{4\pi r^2} = 3r. \quad (8.2.3)$$

At the other extreme end of mass-energy equivalence, when $t \rightarrow 0$, the energy and entropy dominates, hybrid with each other, the dimension is passed on to 4-dimension in the form of Electromagnetic (EM) waves

$$\text{energy} \times \text{entropy} = 4\pi r^3 \times 3r = 12\pi r^4 = \frac{27}{4\pi} (\text{push forward})^2. \quad (8.2.4)$$

The matter pass on to a state of (push forward)² from a state of (push forward). This push forward square is basically the EM wave, which is generating an electro-magnetic radiation. The electro-magnetic wave and energy are of distinctly different dimensions.

The famous “Black Body Radiation” [16] phenomena is an ‘electromagnetic wave-temperature’ phenomena and not an ‘energy-temperature’ phenomena.

The ‘UV catastrophe’ [17] as is arising from the consideration of classical physics is simply arising out due to erroneously considering the wave and energy being the variables of same dimension and not taking into account the mass-energy equivalence phenomena.

8.3 Dimensionality of Electro-Magnetic (EM) Wave

‘Energy’ is out and out a push forward phenomenon, while electro-magnetic wave [18] is a phenomenon of flow of energy from matter to space.

ELECTRO-MAGNETIC WAVE = FLOW OF ENERGY

Energy is 3-dimensional, but when it flows it traverses distances or lengths and as a result an extra dimension is added to it and then it

becomes a 4-dimensional entity. This extra dimension is generated from the matter itself from the 'entropy-energy hybrid' wheel, as will be discussed in the subsequent sections.

Scientists faced problems to explain the Black Body Radiation curves, especially the diminishing intensity of wave at lower wave lengths. Again to mention that it occurred due to the same problem of confusing wave with energy. We will show in subsequent sections that once the wave is considered as "entropy-energy" hybrid, the shape of the 'Black-Body Radiation' curves become very much relevant for obvious reasons, thereof. So at one end of mass-energy equivalence we encounter a de-growth of matter and the other extreme phenomenal growth in the form of (push forward) → (push forward)².

In between the two extremes, matters lie in the state of "PUSH FORWARD". In this state of matter, a wave is also generated, but are of higher wavelengths and lower energies originated from entropy energy hybrids and it is being called thermal radiations (like infra-red, microwave, radio-wave...). This hybrid of energy entropy is a partial hybrid type and is weak in magnitude.

The 4-dimensionally of electromagnetic radiation can also be recognized once the alternating current (AC) propagation pattern is considered. An alternating current also propagates in the same fashion as an electromagnetic wave. It has already been shown in this article that alternating current is 4-dimensionally.

According to the Ohm's law

Current = (Potential difference or emf or voltage)/(resistance), or
Current = Potential difference x conductance

The first part of the above relation has a dimensionality 1 (as has been shown) and conductance being the inverse of resistance is of 3-dimension. So far an electromagnetic wave

Electric current (electromagnetic wave) = entropy (potential difference) x conductance (volume or Energy)

$$= r \times r^3 = r^4 \quad (8.3.1)$$

So an EM wave is out and out a 4-dimensionally entity.

9. Black Body Radiation and "Entropy-Energy" Hybrid Rotating wheel

The 'UV catastrophe' of Rayleigh jeans [19] was originated on the ground of energy becoming higher and higher without any limit. The unified theory clearly predicted the following two phenomena.

$$\text{EM wave density} = \left(\frac{\text{Wave}}{\text{Volume}} \right) = \left(\frac{r^4}{r^3} = r \right) \text{ is } r \quad (9.1)$$

$$mE = 9. \quad (9.2)$$

So, based on the above said point a and b it is quite clearly understandable that since mass and energy are both related to r value and mE = constant, r can never be limitless.

Black Body radiation curves have to fall after reaching a peak maximum; otherwise the energy density will not remain constant. Best on the mass-energy equivalence equation, mE = 9, it is quite obvious neither mass nor the energy can attain zero or infinite values. So the intensity curve of Black Body cannot be boundless leading to 'UV catastrophe'.

Energy is a hybrid of entropy and push forward (temperature)

$$\text{Energy} = 3r \times \frac{4\pi r^2}{3} \quad (9.3)$$

On the other hand EM wave is a hybrid of entropy and energy

EM Wave

$$= \text{entropy} \times \text{energy} \times 2\pi = (3r) \times (4\pi r^3) \times (4\pi/3) = 16\pi^2 r^4 \quad (9.4)$$

(4π/3) is a push forward factor and is explained in section 20.

Max Planck tried to explain the pattern of EM waves coming out from a Black-Body considering wave as energy. This is however, is not the appropriate attempt.

Planck had explained the 'UV catastrophe' phenomena and diminishing intensity of energy of Black-Body at higher frequencies (or shorter wave-length) by introducing an empirical parameter ($e^{h\nu/kT}-1$) in Rayleigh-Jeans classical equation and which is simply a mathematical manipulation to match the experimental findings. Now we put forward the actual mechanism of generation of EM-waves and at the same time explain the Black-Body radiation curves.

In Figure 9.1, the energy rich zone (as per Eqn.9.4), the energy-entropy hybrid wheel starts rotating. The frequencies of rotation get higher as we go up in this region.

The entropy lines (which contain so many infinitely small masses) are being thrust and twisted by energy and as a result the wave fronts are generated as shown in figure 9.1

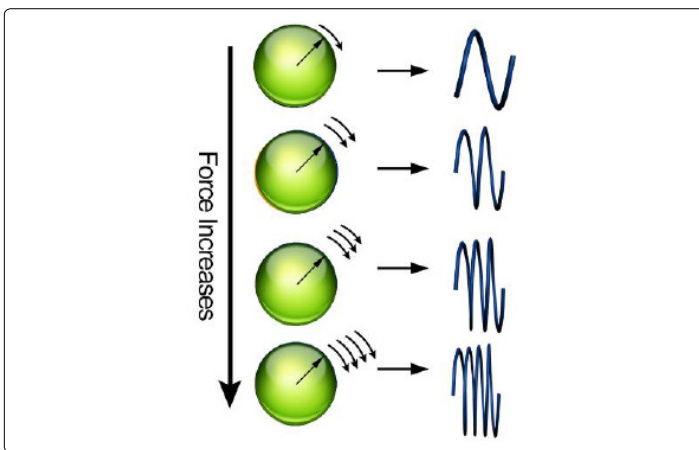


Figure 9.1: Emission of Electro- Magnetic wave from “Energy-Entropy” Rotation Hybrid Wheel, as the Angular Frequency of Rotation Increases High Energy Rotation Increases High Energy Radiation are being Emitted

A wave fronts are the energy-twisted entropy lines. The entropy-entropy rotating wheel has the following characteristic features

It gets accelerated with decrease in time.

In each 360° rotation of the wheel it emits a certain fixed nos. of wave fronts and it propagates out in the space one after another.

The rotating wheel decrease in dimension or size with decrease in time after reaching of maximum mass delocalization, energy localization. As the acceleration of the rotating wheel get higher and higher, the entropy lines are being bi-furcated, tri-furcated; tetra-furcated... multi-furcated and more and more high frequency (lower wave length) waves are produced.

The angular frequency of the wheel is a 2-dimensional variable (r^2) and hence are not continuous but since r is being quantized, the magnitudes of the emitted wave are also quantized.

The intensity of the radiation goes higher and higher and reaches a maximum. The intensity of radiation reaches a maximum and owing to the decrease in size/dimension of the energy-entropy wheel with diminishing t , the intensity falls off at lower wavelength after reaching a maximum and transforms to an exponential shape.

The above model qualitatively describes the black Body radiation curves and nothing is empirical in this model.

The ‘energy entropy’ hybrid wheel can be compared with a bicycle riding. A cyclist paddles slowly at the beginning and the wheels rotates slow (as well transmits energy to the surroundings with low intensity) but as the cyclist paddles fast the wheels are accelerated and starts emitting more energies to the surroundings (higher intensity, higher level energy). When the cyclist stops paddling, the wheel go on emitting higher energy (high frequency low wave length) for some time bringing the wave intensity at a

peak maximum and then the intensity of the transmitted energy drops to a very low value. The spokes of the wheel of a cycle can be compared to the entropy line. The spokes, as if, are thrust and twisted by energy and take the shape of wave-fronts and spreads out to the space.

9.1 Dimensionality of Electric Fields and Magnetic Fields

“A charged particle moving without acceleration produces an electric as well as magnetic field. It produces an electric field since it is charged particle. At rest, it does not produce a magnetic field, but all of a sudden when it starts moving, it starts producing a magnetic field.”

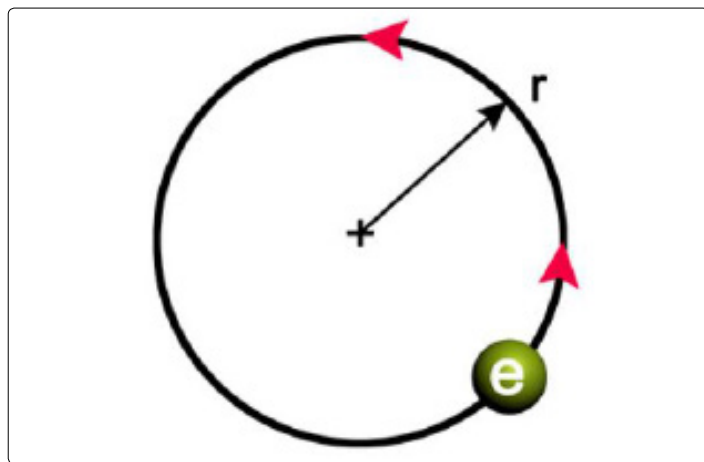


Figure 9.1.1: An electron moving in circular path of radius- r

Classically, when an electron (as shown in above figure 9.1.1) is moving on a circular orbit will produce a current, I , and I is equal to [20-21]

$$i = \frac{v \cdot e}{2\pi r} \quad (e = \text{charge of the electron, } v \text{ is the velocity}) \quad (9.1.1)$$

Now, if the unified theory derived dimensions are put in the above equation, the dimensionality of electric current is obtained as

$$i = \frac{\text{volume} \times \text{area}}{2\pi \times \text{distance}} = \frac{\text{area} \times \text{area}}{2\pi} = \frac{(\text{area})^2 (r^2)^2}{2\pi \cdot 2\pi} = \frac{r^4}{2\pi} \quad (9.1.2)$$

So an electric current is 4-dimensional as has already been argued in a different fashion. Here, it needs some detailed discussion on the dimension of electric field, electric flux, magnetic field and magnetic flux. Then, from there the dimensionality of electromagnetic wave could be understood.

The electric field bears a classical dimension of Newton/Coulomb. Now Newton is force and has a dimension of r^2 and Coulomb being the charge, has a same dimension of r^2 . So an electric field is basically dimensionless.

Formation of a magnetic field is the result of passage of electric current or movement of charged species. An electric current has been shown as a 4-dimensional entity. Hence an electromagnetic field or wave being the hybrid of magnetic field and electric field and the latter being dimensionless, electro-magnetic field or EM wave is 4-dimensional too, like a magnetic field is.

Electric field is basically a direction. For a positive electric charge source, the field acts away from the source charge and in case of negative electric charge it is pointed towards the direction of the source charge.

The electric field is expressed by an equation [21-22] as under

$$\text{Electric field} = \vec{E} = \text{Coulomb constant} \times \frac{\text{source charge}}{(\text{distance from source charge})^2} \times \text{direction vector}$$

$$\text{Or, } \vec{E} = k \times \frac{q}{r^2} \cdot \hat{r} \quad (9.1.3)$$

Where

k = Coulomb's constant (N.m²/C²)

C = Coulomb

q = Charge

r = Distance from the source charge

\hat{r} = direction vector.

Now the unit of Coulomb's constant is (Newton.m²)/C²

If we analyze the dimensionally

Newton = Force = r²

Meter = Distance = r

Coulomb = Charge = r²

So, the dimension of Coulomb's constant is $\frac{(r^2 \times r^2)}{(r^2)^2} = (r^4)/(r^4) = 1 =$ dimensionless

Now in equation 9.1.3, if we put the dimension of all the variables, we get

$$\vec{E} = 1 \times \frac{r^2}{r^2} \times \hat{r}$$

$$\text{or, } \vec{E} = \hat{r} \quad (9.1.4)$$

Now, \hat{r} is a dimensionless direction vector. So electric field is dimensionless.

A magnetic field in the conceptual sense is the area around a magnet, where there is magnetic force. So magnetic field is a hybrid of force and area and both being 2-dimensional, a magnetic field is a magnetic field in the conceptual sense is the area around a magnet,

where there is magnetic force. So magnetic field is a hybrid of force and area and both being 2-dimensional, a magnetic field is 4-dimensional. The magnetic field is originated from the movements of electric charge. The movement of electric charge is 'current'. Current, as has been shown earlier is 4-dimensional. So the above two arguments clearly establish, a magnetic field is 4-dimensional.

Electromagnetic field or electro-magnetic wave being the hybrid of electric field and magnetic field is also 4-dimensional in view of the non-dimensionality of the electric field.

If an electric charge is placed anywhere in the space regardless of whether the charge is a negative one or a positive one, a direction is created. This direction is either towards the charge or away from the charge. The classical unit of electric field, i.e., Force/Coulomb stands justified. Force and Coulomb (charge) has the same dimensionally of r², cancels each other. The force has a direction so though the dimensionality of force and charge cancel each other; the direction is left as a residue. So electric field is characterized by a direction only. Electric field is a direction generating machine, in fact.

In case of magnetic field, the classical units provided are Amperes/meter and is symbolized as H. Any variable expressed in the form per unit length, per unit area or per unit volume leads to some sort of intensity or strength variable. So, classical definition or unit is not an appropriate presentation of a magnetic field's absolute dimension. The classical unit of a magnetic field in fact leads to a magnetic field strength rather than a magnetic field. The unit or dimensionality of a magnetic field is bit conceptual.

A charge moving around a conducting wire loop creates a magnetic field around it. So magnetic field is in fact a "Push forward" of charge. Push forward is dimensionally r² and a charge is also r². So the hybrid of the two is r² × r² = r⁴. So Magnetic field is distinctly a 4-dimensional physical variable of the universe. So classical representation of magnetic field, in the form of Ampere per meter, is in fact the unit of magnetic flux or magnetic field intensity.

The conventional expression for Magnetic field [21], as we find in the literature is

$$\text{Magnetic field, } H = [B] [V] [Q] \quad (9.1.5)$$

B = Magnetic flux density = Mt²(Amp)⁻¹

V = Velocity of the field Lt⁻¹

Q = Electric charge = [Amp] [t]

$$\text{So, } H = MLt^{-2} = \frac{ML^2t^{-2}}{L} = (\text{energy/per unit length}) \quad (9.1.6)$$

If we put the dimension derived from unified theory in this

$$H \text{ become } \frac{1}{r^3} x r x r^4 = r^2 \text{ (an unit of charge of unified theory)} \quad (9.1.7)$$

So, it represents magnitude of charge.

Again, to emphasize, that the magnetic field is defined as the region around the magnet, where it poles and the electrical charges experiences the force of attraction or repulsion. So the r^2 of charge needs to hybrid with another force field having a dimensionally of 2, to obtain the true r dimensionally of a magnetic field.

So, Magnetic field, dimensionally = $r^2 \times r^2 = r^4$

A magnetic field can be viewed, as if one places, a bar magnet on a sphere as shown in figure 9.1.2

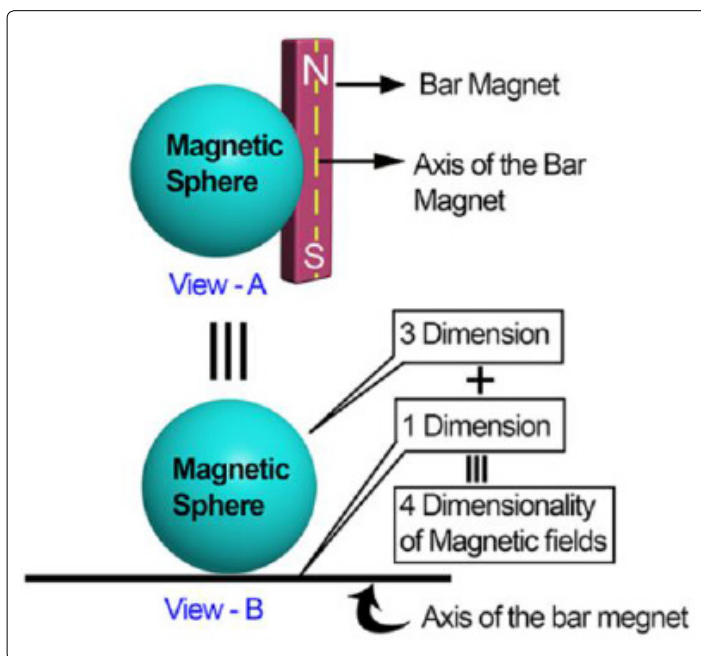


Figure 9.1.2: (a) A bar magnet resting on a magnetic sphere and the magnetic fields on the different Zones of the sphere exactly resembles to that of earth's magnetic fields
(b) Cross-Sectional view of (A)

Once a bar-magnet is being placed on a sphere, the magnetic field on the surface of the sphere just resembles magnetic field pattern of the surface of the earth [20-21]. If we consider the axis of the bar magnet and try to picturize this bar magnet – sphere combination, (as shown in figure 9.1.2), it simply represents a sphere with a tangent on any point of the surface of the sphere. The sphere is 3- dimensional and the tangent is 1-dimensional. The sum of the two takes us to a 4-dimensionality of a magnetic field. We will show at the end of the article all physical variables of the universe can be represented

by a sphere, straight line/lines and circle/circles.

Both the magnetic field and the electric field have the capability to induce surface charges. Charges are 2-dimensional and hence an electromagnetic wave being the hybrid of an electric field and a magnetic field is 4-dimensional.

9.2 Explanation of Black-Body Radiation Curves in Relation to Rate of De-Localization of Mass (RDM) and Rate of Localization of Energy (RLE)

We have defined EM wave as r^4 .

$$\text{So, EM WAVE} = (\text{TEMP})^2 \quad (9.2.1)$$

Now we have defined temperature as

$$\left(\frac{\text{space expansion} \times \text{degree of order}}{3} \right)^{1/2} \quad (9.2.2)$$

So, EM wave = (Temperature)² = (space expansion x degree of order)/3

At the start of a Black-body radiation at any temperature RLE is low and RDM becomes more and more with time. The intensity of the wave will be, with the help of equation (9.2.2) can be written as

$$\frac{\text{Wave}}{\text{Volume}} = \frac{\text{space expansion} \times \text{degree of order}}{9 \times \frac{4}{3}\pi r^3} = \frac{\frac{3}{r} \times \frac{16\pi^2 r^5}{9}}{9 \times \frac{4}{3}\pi r^3} \quad (9.2.3)$$

$$\text{Intensity of wave} = \frac{4\pi}{9} \cdot r \quad (9.2.4)$$

So as r increases the intensity of the wave increases. After reaching to a maximum point or maximum permissible value of RDM, energy localization begins (to maintain the mass-energy equivalence equation $mE = 9$) and the ' r ' value has to decrease and in fact the value starts decreasing and as a result the intensity of the waves fall and becomes lower and lower. There is an upper limit of temperature too. Like the impossibility to reach to a state of absolute certainty (absolute zero), one cannot land-up to a stage of absolute uncertainty (temperature increasing boundlessly) of the universe. So the right hand sides of Peak maximum of the Black Body radiation curves are originated from the fast increase in the magnitude of RDM and the left hand sides of the peak maximum originates from the fast increase in the magnitude of RLE while RDM had reached its maximum value.

Neither the classical Mechanics, nor Prof. Max Planck, nor Prof. Albert Einstein considered the following factors

- i) RDM, ii) RLE and iii) Mass-energy equivalence

9.3 Phenomenon of Photo-Electric Effect in the Light of QG Theory and In-appropriateness of Photon Model of Albert Einstein

Photoelectric effect [22], a well-known phenomenon of science, is an interaction phenomenon of ‘EM-wave’ and ‘matter’ of and under no circumstances is an interaction between a ‘matter’ and ‘energy’. The dimensionalities of a matter (in a stage of push-forward) and EM wave are, 2 and 4 respectively. The hybrid of the two is,

$$4\pi r^2 \times 16\pi^2 r^4 = 64\pi^3 r^6 = 36 \times \frac{16\pi^2 r^5}{9} \times r$$

$$= 36 \times \text{acceleration} \times \text{distance}$$

$$= 36 \times \text{acceleration} \times \text{entropy} \tag{9.3.1}$$

So, the ‘matter-wave’ hybrid leads to an acceleration and until and unless an acceleration is generated the electrons cannot be emitted from a surface. The acceleration is originated from a high intensive second-degree energy situation as shown below.

The equation (9.3.1) can be written as

$$4\pi(4\pi^3)^2 = 4\pi \times (\text{energy})^2 = 4\pi \times (E)^2 \tag{9.3.2}$$

Energy is (Force x distance) and (Energy)² is (acceleration x distance) and it can be stated that acceleration is originated from second degree force or (Force)²

Acceleration = (Force)² x distance = 5-dimension.

Now, photoelectric effect

$$= \text{Acceleration} \times \text{Distance} = (\text{Force})^2 \times (\text{Distance})^2 = (\text{Force} \times \text{Distance})^2 = (\text{Energy})^2$$

Albert Einstein’s photon concept of EM-Wave could not depict any acceleration phenomena in photo-electric effect. It depicted the generations of a uniform velocity of the electrons. The electrons are randomly ejected from the surface of metal and is not a directional emission (velocity) and it is hard to imagine that how, without acceleration the electrons can be emitted?

Einstein postulated that the entire energy of photon is transferred to metal surface, but this is an absurd phenomena as per the mass-energy equilibrium, $mE = 9$.

A photon, if at all transfer all its energy, its own energy becomes zero (a case of absolute certainty or reaching absolute zero) and which is forbidden and can never happen in the universe.

So photo-electric effect can be schematically shown as in figure 9.3.1 below

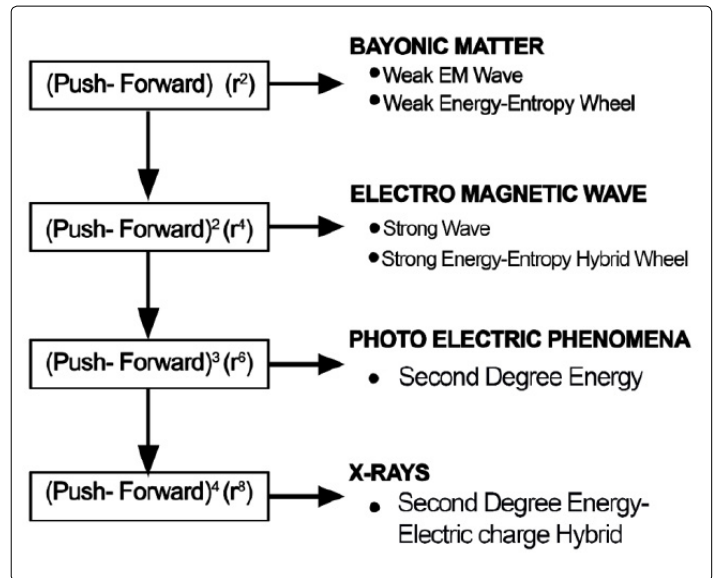


Figure 9.3.1: Schematic representation of photoelectric effect

So, the wave model of Planck, the photon model of EM wave of Albert Einstein, both turn out to be non-appropriate propositions. Planck’s model can be correlated to energy but not to EM wave.

An EM wave is 4-dimensional and a mass-energy co-existent entity or energy-entropy hybrid rotating wheel wave-front emission phenomena.

The nomenclature of EM wave as “photons” needs to be changed to ‘entropy wave’ or ‘EM-WAVE GRAVITONS’ nomenclature in basic science terminology.

10. Evolution of Dimensions From “Energy-Time” Hybrids

We will prove that many happenings of the universe can be explained by energy and time factors. Multi dimensionality and origin of mass disintegration (nuclear fusion) phenomena or radio-activity, generation of X-rays, γ -rays can be explained by ‘energy-time’ hybrids. In Table 10, we show, keeping the order of energy constant and by varying the order of time (i.e., t, t^{1/2}, t^{3/2}...) how the different phenomena, dimensions are evolved, one after another.

The generation of dimension lies truly in the hand of the Scientists of the human race. In Table 10.1, order of time has been reduced by ½ consecutively and mysteries of the universe are explored.

The results of ‘Time-energy’ hybrid of Table 10.1 and Table 10.2 reveal that scientists can make miracles by utilizing the ‘energy-time’ hybrid concept by permutations and combinations between the two. One can create a situation like anti-gravity even, and of course the engineers can be designing super-sonic speed jet engines to drive motor vehicles, airplanes and rockets.

Table 10.1: Dimensions of the physical variables of the Universe, in the form of time-energy hybrid field - I.

Sl. No.	Energy-Time Hybrid	Dimension interms of 'r'	Evolved Numeric Dimension	Significances
1.	$E.t^{3/2}$	r^0	0	Absolute certainty or absolute zero - non-attainable
2.	$E.t$	r^1	1	Distance or entropy
3.	$E.t^{1/2}$	r^2	2	Area, Force, Temperature, push forward, electric charge... etc.
4.	$E.t^0$	r^3	3	Energy, Volume, intensity, conductance... etc.
5.	$E.t^{-1/2}$	r^4	4	EM wave, Alternating current, 2nd degree temperature or push forward
6.	$E.t^{-1}$	r^5	5	Acceleration, power, space expansion
7.	$E.t^{-3/2}$	r^6	6	2 nd degree energy, 2 nd degree intensity, photo electric phenomena, magnetic dipole... etc.
8.	$E.t^{-2}$	r^7	7	Energy-wave hybrid, nuclear fission or mass disintegration
9.	$E.t^{-5/2}$	r^8	8	2 nd degree electric current or 2 nd degree EM wave
10.	$E.t^{-3}$	r^9	9	3 rd degree energy, intensity of 3 rd degree, plasma state
11.	$E.t^{-7/2}$	r^{10}	10	2 nd degree acceleration or inverse gravitation or anti-gravity phenomena of supernova
12.	$E.t^{-4}$	r^{11}	11	Growth of plasma state like growth of Baryonic matters of the universe
13.	$E.t^{-9/2}$	r^{12}	12	Cosmic rays generation

Table 10.2. Dimensions of the physical variables of the Universe, in the form of time-energy hybrid field - II.

Sl. No.	Energy-Time Hybrid	Dimension in terms of 'r'	Evolved Numeric Dimension	Significances
1.	E.t	r^1	1	Distance or entropy
2.	E^2t	r^4	4	EM wave
3.	E^3t	r^7	7	Mass-disintegration or nuclear fission
4.	E^4t	r^{10}	10	anti gravity phenomena, supernova
5.	E^2t^2	r^2	2	State of matter when two dimension merge to form a single dimension more condensed matter
6.	E^3t^3	r^3	3	3-dimension merges to form a single dimension more condensed state of matter
7.	E^4t^4	r^4	4	4-dimensions merge to form a single dimension furthermore concentrated form of matter

Designing of a fabricated 'tailor made' new artificial universe even might be possible in due course of time.

Representing the universe' a dimensionality in terms of energy, mass, time, acceleration, entropy and gravitation

Table 10.3. Dimensionalities in regard to energy, mass, time, temperature, acceleration, gravitation and entropy.

PHENOMENA AND DIMENSIONALITY			REPRESENTATION OF DIMENSIONALITY OF UNIVERSE						
Sl.No.	Dimension	Phenomena	E	M	t	T	f	G	S
1	1	Distance or Entropy-r	1/3	-1/3	-1/2	1/2	1/5	-10	1
2	2	Area – r^2	2/3	-2/3	-1	1	2/5	-5	2
3	3	Volume(Energy)- r^3	1	-1	-3/2	3/2	3/5	10/3	3
4	4	EM-Wave- r^4	4/3	-4/3	-2	2	4/5	-5/2	4
5	5	Acceleration- r^5	5/3	-5/3	-5/2	5/2	1	-1/2	5
6	6	Photo Electricity- r^6	2	-2	-3	3	6/5	10/3	6
7	7	Nuclear Fission- r^7	7/3	-7/3	-7/2	7/2	7/5	-10/7	7
8	8	X-rays- r^8	8/3	-8/3	-4	4	8/5	-5/4	8
9	9	Plasma State- r^9	3	-3	-9/2	9/2	9/5	-10/9	9

10.1 Dimensionalities of Nuclear Fission, Plasma State, X-Rays, Supernova and Cosmic Rays

Nuclear fission [23] is mass disintegration. Nuclear fission is done by bombarding matters with accelerated neutrons. So, basically it is an interaction of ‘matter and acceleration’ Baryonic matters are in the form of Push forward. So nuclear fission is a hybrid of acceleration and push forward

$$\text{Acceleration x push forward} = r^5 \times r^2 = r^7 \quad (10.1.1)$$

Nuclear fission is 7-dimensional.

Plasma State

Plasma state or 4th-state of matter [24] is generated when an insulator turns into a conductor characterized by a spark. The plasma state is very much related to the acceleration phenomena. When a reasonably high potential difference is applied across a dielectric material, the electric field accelerates the bound electrons to the anode and the nucleus is accelerated to the cathode. So plasma state is a hybrid phenomenon of electric current and acceleration

$$\text{Electric current x acceleration} = r^4 \times r^5 = r^9 \quad (10.1.2)$$

So, plasma state is 9-dimensional being the 4th state of matter. Also, it can be called as a 3rd degree energy (E³) phenomena.

Supernova and Cosmic Rays

Supernova is a situation of anti-gravity [25]. Gravitation is inverse 10-dimensional. When the gravitation inverts itself, it does pass on to a state of very strong repulsive forces, acting among the molecules of a matter. So Gravity being r⁻¹⁰ in dimension, does pass on to a state of r¹⁰ and very much higher in magnitude in the form of strong repulsive force. The molecules of the matter are ejected away in all over the direction in space. Supernova being a 10-dimensional entity can be compared with a ‘GIRANDOLE’ (a fire-work). The girandole rotates and the matter inside it is thrown away all over the directions in the form of rays. This is illustrated in figure 10.1.1 below

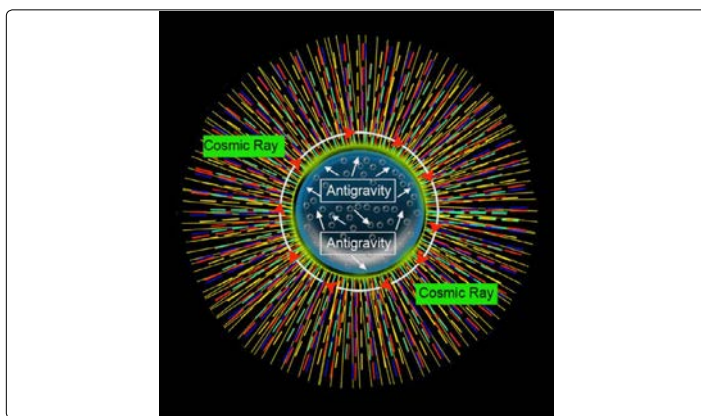


Figure 10.1.1: Antigravity- Cosmic Rays; A Rotating Girandole throws away Matters towards the surface of it (Due to Antigravity Phenomena) and from although the surface the cosmic Rays are emitted and spread over long distances

As a matter of fact, the rays coming out of a supernova are spread over all directions in space are cosmic rays and almost cover the entire electro-magnetic region, like, gamma-ray, X-ray, UV,.... The cosmic rays are spread of supernova. The phenomena happening within a ‘burning girandole’ is supernova alike and the spread of the rays all over the directions is alike cosmic rays.

The said 2nd degree accelerations are imposed on the charged particles (those are proton formed from the matter, losing electrons due to the impact of supernova and the protons are separated from the neutrons too) and the particles move in the space. So cosmic rays are hybrids of charge and (acceleration)².

$$\text{Charge x (acceleration)}^2 = r^2 \times r^{10} = r^{12} = (E)^4 \quad (10.1.3)$$

So cosmic rays are 4th degree energy, basically. This is a very special case and should not be included in the dimensionality of the universe.

X-rays

X-rays are voltage induced acceleration of electrons hitting metals [26] (generated from, a hot cathode).

So, it is in fact a hybrid of, (Potential difference x acceleration x Push forward)

The metal is considered to be a Baryonic matter in the state of Push forward or r². So, the dimensionality of X-ray is

$$r \times r^5 \times r^2 = r^8 \quad (10.1.4)$$

The charge of the electron is not considered here, since the charge of the electron is being neutralized by anode bearing positive charge.

Plasma state is one step ahead of X-rays in regard to its dimension.

10.2 Magnetic field, Magnetic potential in connection with electric charge and electric field.

A magnetic potential is the inverse function of charge as has been already mentioned in this article. ‘Magnetic Potential-charge’ is like ‘Mass-volume’ or ‘Mass-energy’, a sort of multiplicative inverse to each other.

A charge when stationary produces an electric field. A moving charge produces both an electric current and a magnetic field. A charge when localized produces a magnetic potential. The ‘North Poles’ and the ‘south poles’ of a magnet being the Magnetic Potentials are arising out of charge localizations. Electric current is the result of charge delocalization.

When two surfaces are rubbed against each other, charges are generated on the surfaces and the charges being 2-dimensional, rest on the surface. As soon as the charges start moving electric current is produced. On the contrary, when the said charges are dimensionally inversed, the charges are forced to go inside the matter and a magnetic potential is developed. A magnetic potential is generated due to charge trapping. All these facts are illustrated in the following diagram (Figs.10.2.1 & 10.2.2)

Whenever

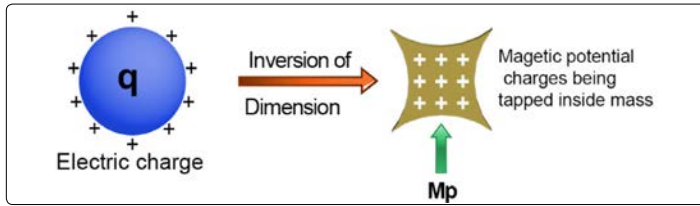


Figure 10.2.1: Electric charge (q) converted to Magnetic potential due to inversion of Dimension

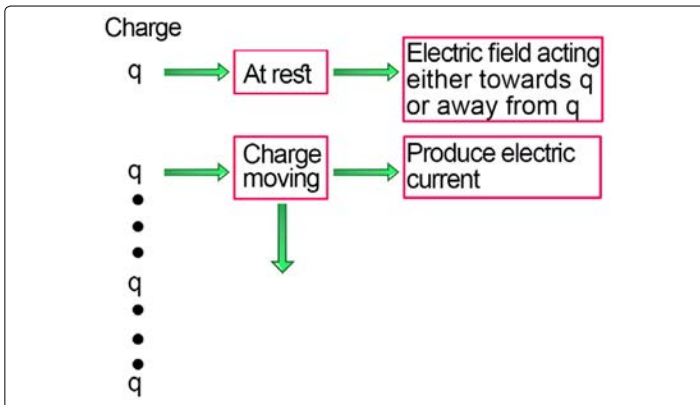


Figure 10.2.2: Moving electric charge generates electric current

Whenever charges are forced to move to generate electric current, some charges are spontaneously inverting their dimensions or get localized, leading to charges being trapped, and generating magnetic potential. So “charge delocalization” and “charge localization” are parallel happenings or incidents. While the former produces current and latter produces magnetic field. The fact that an electric current is always being associated with a magnetic field, do arise for the above said factors.

The entire subject of generation of ‘North Pole’, ‘South Pole’ of a magnet, magnetization, de-magnetization, the phenomena of electro-magnetization will be dealt in a separate article to be submitted by the authors.

11. Quantum Mechanics and Quantum Gravity, the Unification Horizon

11.1 Schrodinger Time-Dependent and Time-Independent Equations in QG Theory

Schrodinger had proposed 2 nos. of wave equations, one is the time-independent and another is time-dependent [27,28].

He had put forward the total energy (E), of the wave, in the form of kinetic energy and potential energy, as shown below.

$$E = \frac{p^2}{2m} + V \quad (11.1.1)$$

Where p is the momentum, m is the mass and V is the potential energy.

If we put the unified theory derived dimensions of the variables in the above equation (11.1.1), we obtain

$$E = \frac{(mv)^2}{2m} + V$$

$$\text{or} \quad 4\pi r^3 = \frac{9}{2m} + V \quad (11.1.2)$$

$$4\pi r^3 = \frac{9 \times 4\pi r^3}{2 \times 9} + V \quad (m = 9/4\pi r^3) \quad (11.1.3)$$

$$\text{or} \quad 4\pi r^3 = 2\pi r^3 + V \quad (11.1.4)$$

$$V = 2\pi r^3 \quad (11.1.5)$$

Now the time-dependent equation proposed by Schrodinger is not much meaningful in the sense, the time in the said equation is the conventional scale of time and which is nothing but a ‘distance’. The form of the equation is

$$\frac{-\hbar^2}{2m} \cdot \frac{d^2\Psi}{dx^2} + V\Psi = i\hbar \frac{d\Psi}{dt} \quad (11.1.6)$$

$$\Psi = A \cdot e^{-i\omega t} \quad (11.1.7)$$

Ψ is the wave function, \hbar is the reduced Planck constant, A is the proportionately constant, t is time and ω is the angular frequency

Now angular frequency is (number of cycles)/(sec) and as per unified theory it has a dimension of $1/(1/r^2) = r^2$.

So, when the value of ω is put into equation (11.1.7), it takes the form

$$\Psi = A \cdot e^{-i\omega t} = A \cdot e^{-i \cdot r^2 \cdot \frac{1}{r^2}} = A \cdot e^{-i} \quad (11.1.8)$$

So, the time part is totally eliminated from the time-dependent form of wave function Ψ .

So, the time-dependent wave equation proposed by Schrodinger has no real significance.

The time-dependent equation is in fact, being hidden in the time independent equation of Schrodinger. The time-dependent equation is evolved from the time-independent equation, once the dimensionalities of the physical variables are truly considered. The time-independent form of Schrodinger wave equation is

$$\nabla^2 + \frac{8\pi^2 m}{\hbar^2} (E - V)\Psi = 0 \quad (11.1.9)$$

$$-\nabla^2 = \left(\frac{d^2}{dx^2} + \frac{d^2}{dy^2} + \frac{d^2}{dz^2} \right) \Psi \quad (11.1.10)$$

We defined the wave function Ψ in the unified theory as per Eq.9.4 already developed

$$\Psi = 16\pi^2 r^4 \quad (11.1.11)$$

Now the dimensionalities of m, \hbar , E, V are put in the equation

$$-\nabla^2 + \frac{8\pi^2 \cdot \frac{9}{(3r)^2}}{4\pi r^3} (2\pi r^3)\Psi = 0 \quad (11.1.12)$$

$$-\nabla^2 + \left(8 \cdot \pi^2 \cdot \frac{1}{4\pi r^3} \cdot 2\pi r^3\right) \quad (11.1.13)$$

$$-\nabla^2 + \frac{4\pi^2}{r^2} x \Psi = 0 \quad (11.1.14)$$

$$-\nabla^2 + 4\pi^3 x \frac{3}{4\pi r^2} x \frac{4}{3} \cdot \Psi = 0 \quad (11.1.15)$$

$$-\nabla^2 + \left(\frac{16}{3}\right)\pi^3 t \cdot \Psi = 0 \quad (11.1.16)$$

So, the above Eqn.11.1.16 is the true time-dependent Schrodinger equation being evolved from the time independent wave equation, proposed by Schrodinger

Here is the relevance to show that Ψ is evolved from time, 't' and 't' is evolved from Ψ

$$\Psi = 16\pi^2 r^4 = \frac{16\pi^2 r^4}{9} \cdot 9 = \frac{9}{t^2} \quad (11.1.17)$$

$$t^2 = \frac{9}{\Psi} \quad (11.1.18)$$

$$t = 3 \cdot \frac{1}{\Psi^{1/2}} \quad (11.1.19)$$

Ψ can also be expressed in terms of energy, E and time, t and vice versa.

$$\Psi = 16\pi^2 r^4 = \frac{3}{4\pi r^2} \cdot \left(\frac{64}{3}\right)\pi^3 r^6 = (4/3) t\pi(4\pi r^3)^2 \quad (11.1.22)$$

$$\Psi = (4/3) \Psi \pi t E^2 \quad (11.1.23)$$

$$t = \frac{3\Psi}{4\pi E^2} \quad (11.1.24)$$

So Ψ , t, E, V, T, m, S, G,... are all quantized physical variables in this universe.

The actual representation of Ψ function versus time is shown in figure 11.1.1

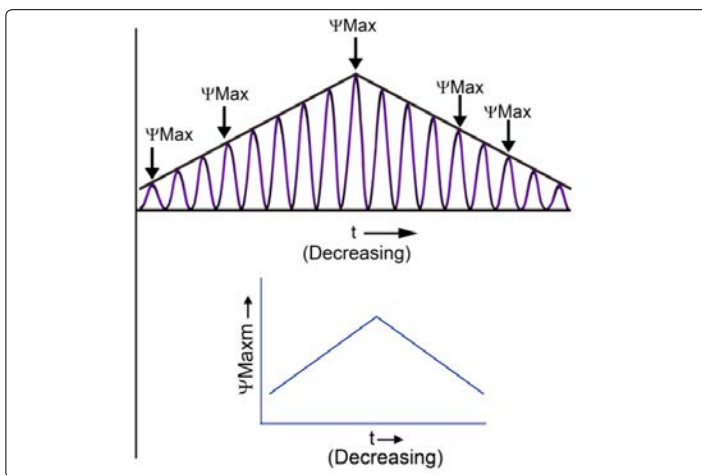


Figure 11.1.1: Qualitative Presentation of Ψ Wave function with Decreasing Time (t) (a) EM Wave – Time (b) Ψ Max vs t

11.2 Quantum Mechanical Operators in Relation to QG Theory Derived Universal Wave Function

The operators in quantum mechanics [29, 30] for different physical variables can be applied on the unified theory derived expression of wave function, Ψ . We will examine the cases of the following operators:

Momentum, Electromagnetic field, Kinetic energy, Angular momentum, Intensity and Hamiltonian (time-independent)

a. Momentum

The operator is

$$\begin{aligned} -i\hbar \cdot \nabla = -i\hbar \cdot \frac{d}{dr} (\Psi) &= -i \cdot \frac{3r}{2\pi} \frac{d}{dr} (16\pi^2 r^4) = -ix \frac{3r}{2\pi} x 64 \pi^2 r^3 = \\ \frac{-3ix 2x 16\pi^2 r^4}{\pi} &= \frac{-2i}{\pi} x 3 x \Psi \end{aligned} \quad (11.2.1)$$

So, momentum is constant and dimensionless, as already been proved.

b. Kinetic energy

The operator for kinetic energy is, $\frac{-\hbar^2}{2m} \nabla^2$

$$\text{Now } \nabla^2 = d/dr(d/dr(16\pi^2 r^4)) = 192 \pi^2 r^2$$

$$\text{Now, } \frac{-\hbar^2}{2m} = \frac{(3r)^2}{4\pi^2} \cdot \frac{4\pi r^3}{18} = (r^5/2\pi)$$

$$\text{So, } \frac{-\hbar^2}{2m} \cdot \nabla^2 = \frac{r^5}{2\pi} x 192\pi^2 r^2 = \frac{3}{2\pi^2} x 4\pi r^3 x 16\pi^2 r^4 = \frac{3}{2\pi^2} \cdot E. \quad (11.2.2)$$

So, energy dimension also do match, while applying quantum mechanical operator on unified theory derived wave function, Ψ .

c. Angular momentum

The operator angular momentum

$$\hat{L} = rx - ih\nabla$$

The angular momentum is mvr or [M] [L²] [T]⁻¹ and which leads

$$\text{to a value of } \left(\frac{9}{4\pi r^3} x \frac{4}{3} \pi r^3 x r\right) = 3r \text{ as per unified theory.}$$

Now let us examine, the result of applying quantum mechanical angular momentum operator on wave function, Ψ

$$\begin{aligned} -ri \cdot 3r \cdot \frac{d^2}{dr^2} (16\pi^2 r^4) &= (-ri)x(3r)x(192\pi^2 r^2) = (-ri)x(3r)x(192\pi^2 r^2) \\ &= -i x 9 x 4 x 16\pi^2 r^4 = -4i x 3r \Psi \end{aligned} \quad (11.2.3)$$

It does also match with directly derived dimension of angular momentum of the unified theory.

d. Hamiltonian (time-independent)

We have already shown it in the form $\left(\frac{p^2}{2m}\right) + V(x)$ equal to $4\pi r^3$.

Since r is time dependent. So, this time independent Hamiltonian turns into the time dependent Hamiltonian.

11.3 Evaluation of Dimensionality of the Universe from Unified ‘Quantum Mechanics – Quantum Gravity Theory (QG)’

Unified theory has already proved that the physical variable ‘intensity’ has the same dimension as that of volume/energy.

The wave function Ψ of unified theory, if written in the form of intensity, it become

$$\Psi = 16.\pi^2.r^4 = 12.\frac{4}{3}\pi r^3.r = 16.I.r \tag{11.3.1}$$

Or, $I = \Psi/(16r)$ (11.3.2)

Where I represent the intensity.

Energy density or intensity in classical mechanics is represented by the square of the wave function. In quantum mechanics ‘energy density’, ‘intensity’ term has been replaced by the term ‘Probability density’. In quantum mechanics, the Ψ^2 means the probability density of finding the particle in space.

Now, $\Psi^2 = (16\pi^2.r^4)^2 = 256\pi^4.r^8 = \frac{4}{3}\pi r^3 \times 192\pi.r^5 = 192 I \times r^5$ (11.3.3)

Or, Intensity, $I = \frac{\Psi^2}{192r^5}$ (11.3.4)

So, intensity in the form of Eqn.(11.3.4) of Ψ^2 is much more sensitive to a little change in r than Ψ expressed by the Eqn.(11.3.2)

The quantum mechanics Ψ is not the proper wave function to represent the universe, as a whole. The quantum mechanics Ψ is more suited to find the energy levels, positional probability density of finding the microscopic particles, especially the electrons, in the orbital spaces.

On the other hand, the unified theory derived Ψ is more dimension oriented and can take account of the microscopic to macroscopic particles and is a universal one.

In quantum mechanics, it is defined that summation of probability density of the wave function, Ψ is expressed by the integral

$$\int \Psi^2 . dr \tag{11.3.5}$$

This means that at every point in space, there is some possibility of finding the particle. This way if one sums up the possibilities of all the points, i.e., equal to a certainty or 1. The wave function altogether has to exist in the space.

If we apply this concept to the unified theory derived Ψ , we get

$$\int \Psi^2 . dr = \int (16\pi^2.r^4)^2 . dr = 256\pi^4 \int r^8 . dr = (256/9)\pi^4 r^9 + K$$

(constant of integration) (11.3.6)

So, the 9-dimensionality of the universe is evolved from the unified theory derived, Ψ .

The unified theory derived Ψ is the representation of the universe as a whole, is very much broad conceptually than the wave function of quantum mechanics.

Now a question, which has not yet been raised in this article is “What is the definition of dimension?”. The answer is, dimension is a hybrid of mass and energy. Mass being the contracting/inverting phenomena of space or volume and is a pull-back one and energy being dissociative or expanding phenomena is a push forward one. So, dimension is a hybrid of mass and energy. This has been proved at the early stage of this article that $mE=9$.

Then how a 10th dimension is being emerged? The 10th dimension as we will show is neither a ‘mass’ nor a ‘energy’ nor ‘mass-energy’ phenomena, but a very much ‘super gravitation’ or ‘singularity’ phenomena or a merging point, which however, is in the form of dimensionality of r^{10} .

Dimension of the Universe

So, the universe converges to a point, which contains ten nos. of dimensions in the inverse sense. These are the super gravitations or ‘singularity’ gravitons. One after another the dimensions emerge from the gravitons (in the form of r, r², r³,...) and the following 9-dimensions are formed. At the end in graviton a unity is left, which is the smallest possible length, by magnitude, of the universe in the push forward dimension.

Table 11.3.1. Dimensions and the physical variables.

Sl. No.	Dimensions	Description
1	r	Distance, entropy, potential difference,...
2	r ²	Force, push forward, temperature, charge...
3	r ³	Energy/volume, intensity, conductance,...
4	r ⁴	EM wave, electrical current,...
5	r ⁵	Acceleration, power,...
6	r ⁶	Photo electricity
7	r ⁷	Nuclear fission
8	r ⁸	X-rays
9	r ⁹	Plasma state

The Shapes of the different ‘Gravitons’ like force /temperature, volume/energy, EM-Wave, Acceleration/space expansion, Photo electricity, Nuclear fission, X-rays/Gamma rays and the Plasma states are shown in Figure 11.3.1

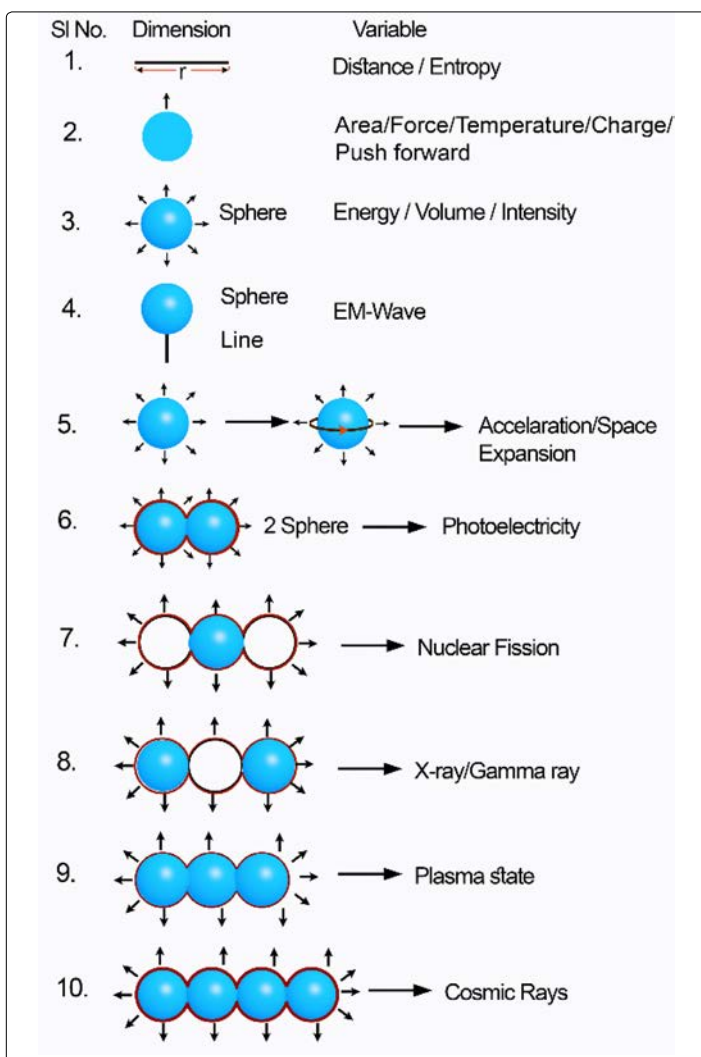


Figure 11.3.1: Schematic Presentation of the “PUSH FORWARD GRAVITONS” or Dimensionality of the Twelve Dimensions of the universe in the Differential or unfolded form

Excluding the ‘GRAVITON’ of dimensionally r^{10} , which is point or ‘singularity’, the universe is 9-dimensional, which ends up with Plasma state beginning from distance or entropy. The relevance’s of all the above said dimension and their inverse dimensions are elaborated fully in the subsequent sections.

So, in the graviton one inverse dimensionality is left as a residue after the consideration of the generation of the plasma state. This residual dimensionality in the form of r^{-1} in graviton when also comes out, it inverts its dimension to r . So ‘graviton’ travelling from entropy to plasma state again at the end, travels to an ‘entropy’ dimension. So, the universe starts with entropy and ends up with entropy again. The conclusion drawn from it, is, the universe is expanding. As the different dimensions are emerge from the super ‘graviton’ it becomes weaker progressively. At the state of r^{-1} it is the weakest. So ‘Graviton’ becomes entropic at this stage.

12. General Theory of Relativity, Black-holes and QG Theory Derived Gravitons

Einstein field equation of general relativity [31-34] is bit mathematical and obscure, but the electric field equation conceptually represents the ultimate ‘left out state’ of the phenomena of gravitation, after all the physical variables play their roles and interact among themselves. Unified theory reveals that the EFE is dimensionally the same as entropy.

Before doing this exercise, we will examine what is ‘Gravitational force’ and ‘gravitational constant’ are, in regard to Newton’s law of Gravitation.

$$\text{Gravitational Force} = F = G \cdot \frac{m_1 m_2}{r^2} \quad (12.1)$$

Now, if we dimensionally analyze this

$$\text{Gravitational force} = G \times \frac{\left(\frac{1}{r^6}\right)}{r^2} = G \cdot t^4 = G \cdot S^{-8} \quad (12.2)$$

The Gravitational constant, on the other hand is

$$G = \text{Gravitational force} \times r^8 = \text{Gravitational force} \times t^{-8} = \text{Gravitational force} \times S^8 \quad (12.3)$$

So gravitational constant of Newton is super intense entropy gravitational force. This super intense entropic gravitation falls down to the super weak entropic gravitation once the super/singularity ‘GRAVITATON’ is fully unfolded.

Einstein field equation is

$$R_{\mu\nu} - \frac{1}{2} R^2 g_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} \cdot T_{\mu\nu} \quad (12.4)$$

$R_{\mu\nu}$ - Ricci curvature tensor

R - Scalar curvature

$G_{\mu\nu}$ - Metric tensor

Λ - Cosmological constant

G - Newton’s gravitational constant

C - Speed of light

$T_{\mu\nu}$ - Stress energy-momentum tensor

Now if we analyze the dimensionally of the r.h.s of Eqn.(12.4), we get the following

$$\frac{1}{r^2} \times 3r^3 \times \left(\frac{81}{256}\right) = \left(\frac{243}{256}\right)r \quad (12.7)$$

$$\frac{8\pi G}{c^4} = \left(\frac{1}{256}\right) \times \frac{81 \times 8\pi \times r^{10}}{(r^3)^4 \times 4\pi} = \frac{1}{r^2} \times (81/256) \quad (12.5)$$

And $T_{\mu\nu}$ = stress x energy x momentum

$$= \frac{\text{Force}}{\text{area}} \times r^3 \times 3 = \frac{r^2}{r^2} \times r^3 \times 3 = 3r^3 \quad (12.6)$$

So, combining the $(8\pi G/c^4)$ part and $T_{\mu\nu}$ part, the net dimensionality turns out to be

EFE ultimately merges to the entropy dimensionality of the universe and this is in full agreement with the observation made by Edwin Hubble [35-38] that the universe is expanding since entropies are being generated.

Now we will show in a tabular form how the ‘singularity graviton’ loses dimension one after another and ‘what is left’ and ‘what the universe’ gets from the said transformation of “SINGULARITY”.

Table 12.1. Travel of ‘Graviton’ from entropy → entropy

Sl. No.	Dimensionality	Phenomena	Phenomena Arising out of Release of r	Dimension left with Singularity
1	r^{-10}	Super graviton/Singularity	Entropy	r^{-9}
2	r^{-9}	Black-Hole Graviton	Entropy, r	r^{-8}
3	r^{-8}	Gravitational collapse graviton	Force, Push forward, r^2	r^{-7}
4	r^{-7}	Nuclear fusion graviton	Volume/energy, r^{-3}	r^{-6}
5	r^{-6}	Condense state	Acceleration, EM wave graviton, r^{-4}	r^{-5}
6	r^{-5}	Space inversion Graviton	Space expansion graviton, r^{-5}	r^{-4}
7	r^{-4}	Anti-magnetic field	Photo electricity, r^{-6}	r^{-3}
8	r^{-3}	Mass graviton	Nuclear fission, r^{-7}	r^{-2}
9	r^{-2}	Time graviton	X-ray, Gamma ra r^{-8}	r^{-1}
10	r^{-1}	Order Graviton	Plasma state, r^9	r^0
11	r^0	End of graviton life time	Entropy, r	-

12.1 Discussion on Graviton Dimensionality and their Significances

The gravitons in Table 12.1 have been a nomenclature each. The nomenclature has been made in line with what the gravitons are themselves in reality. The phenomena the gravitons give rise to given in column 3 of the Table 12.1

Let us examine the process of Black-Hole formation [39-48]. The Black-Holes are unique in the sense that the temperatures of their surfaces are very hot, while the inner core is too cold approaching the absolute zero of temperature. As has been told that due to the quantum effects near the event horizon (the outer boundary of the Black-Hole), the Black Holes emit radiation. These emitted radiations match the spectrum of typical ‘Black Body radiation’ from the matters. However, Hawkin [49-54] calculated the radiation

intensity at a temperature T of the Black Hole [55]. This temperature has been shown to be inversely proportional to the mass of the Black Body

$$T = \frac{\hbar c^3}{8\pi G M k_B} \quad (12.1.1)$$

\hbar is reduced Planck constant

c is the velocity of light

G is Newton's gravitational constant

M is the mass of the Black-Hole

The dimensionality of 'temperature' of Hawkins equation is justified from the unified theory. If we put the dimensionality of the variable in equation (12.1.1) we get

$$T = \frac{r \times (r^3)^3}{r^{10} \times \frac{1}{r^3} \times r} = r^2 \quad (12.1.2)$$

Many theories have been proposed to explain the radiation emission patterns of the Black Holes (what is called Black Hole evaporation) and there are controversies too. The main controversy is, in the phenomena of information generation [56] from a Black Hole. If the radiation is considered to be the normal Black-Body radiation in matter, it must contain the information of the bulk of the Black Hole since Black Body radiation are generated from the Black-Hole itself as a whole

Hawkins's radiation was considered to be originated from the outer surface of the event horizon [57-63] and in that case, it will not carry any information of the inside or core of the Black-Hole.

The unified theory predicts and which will be shown here now, that energy in fact is generated at first at the core of the Black Hole and it reaches subsequently to the surface. While travelling of energy from the core of the Black Hole to the surface, it gains an extra dimensionality to transfer into EM waves and this indeed are being emitted from the outer surface of the event horizon. So it has to contain the information inside the Black Hole. The unified theory conclusion is "BLACK HOLE EVAPORATION IS INFORMATION GENERATION PHENOMENON TOO"

Schwarzschild Black-Hole [64-68] Radius :

$$r_s = \frac{2GM}{c^2} \quad (12.1.3)$$

Here, G = Newton's Gravitational constant,

r_s = Radius of Schwarzschild Black-Hole

M = Mass of the Black-Hole

c = Velocity of light

$$\text{or, } M = \frac{r_s c^2}{2G} \quad (12.1.4)$$

$$r_s = r \quad (12.1.5)$$

$$C^2 = \left(\frac{4}{3}\pi r^3\right)^2 = \frac{16}{9}\pi^2 r^6 \quad (12.1.6)$$

$$G = \frac{f^2}{4\pi} = \left(\frac{16\pi^2 r^5}{9}\right)^2 \times \frac{1}{4\pi} \quad (12.1.7)$$

$$\text{So, } \frac{1}{G} = \frac{81 \times 4\pi}{256\pi^4 r^{10}} \quad (12.1.8)$$

So, Schwarzschild mass,

$$M = \frac{1}{2} \times r \times r \times \frac{16}{9} \pi^2 r^6 \times \frac{81 \times 4\pi}{256\pi^4 r^{10}} = \frac{1}{2} \times \frac{9}{4\pi r^3} \quad (12.1.8a)$$

The above expression just tallies with the expression of mass, as derived in the unified theory.

Now the Schwarzschild density (say ρ_{BL}) expression put forward by the author is :

$$\rho_{BL} = \frac{3C^6}{32\pi \cdot G^3 M^2} \quad (12.1.9)$$

$$\text{Now, } C^6 = \left(\frac{4}{3}\pi r^3\right)^6 = \frac{4^6 \times \pi^6 r^{18}}{3^6} \quad (12.1.10)$$

$$G^3 = \left(\frac{f^2}{4\pi}\right)^3 = \left(\frac{16\pi^2 r^5}{9}\right)^6 \cdot \frac{1}{(4\pi)^3} \quad (12.1.11)$$

$$M^2 = \left(\frac{9}{4\pi r^3}\right)^2 = \frac{81}{(4\pi r^3)^2} \quad (12.1.12)$$

$$\text{So } \rho_{BL} = \frac{3 \times 4^6 \pi^6 r^{18}}{36} \cdot \frac{1}{32\pi} \cdot \frac{(4\pi)^3 \times 9^6}{(16\pi^2 r^5)^6} \cdot \frac{(4\pi r^3)^2}{81} \quad (12.1.13)$$

$$= \frac{3 \times 4^6 \times 4^3 \times 9^6 \times 4^2}{3 \times 32 \times 36 \times 16^6 \times 81} \cdot \frac{\pi^3 \cdot \pi^2 \times r^{24} \times \pi^6}{\pi \times \pi^{12} r^{30}} \quad (12.1.14)$$

$$= \frac{3^6}{4^4} \times \frac{1}{2} \cdot \frac{1}{\pi^2 r^6}$$

$$= \frac{3}{v^2} \cdot \frac{3^3}{4^2}$$

$$= \frac{27}{16} \cdot \frac{3}{v^2}, \left(V = \frac{4}{3}\pi r^3\right) \quad (12.1.15)$$

The expression of density as derived in this QG theory, directly, is, $\frac{3}{v^2}$.

So, the dimensionality the Schwarzschild density, does also match to the 'UNIFIED QUANTUM GRAVITY THEORY OF THE UNIVERSE'.

12.2 Formation of Black-Holes, Phenomenon of Cold Fusion and Concept of Singularity

The recent photograph of a ‘super massive Black-Hole’, as obtained by the NASA Scientists, is in fact not the photograph of a Black-Hole solely. It is the photograph of the following quasi-equilibrium existence of

BLACK-HOLE \rightleftharpoons PLASMA STATE

The fire-ball and the dust atmosphere, as is found surrounding the Black-Hole, in the photograph, is in fact a plasma state.

The unified QG theory has already shown that a Black-Hole cannot exist alone, it has to exist in some sort of quasi-equilibrium with a plasma state, whatever be the circumstance is, as shown in the Fig 21.1.1 of life cycle of super-entropic graviton. In the said life cycle wheel, the plasma state and the Black-Hole exists very close to each other.

The photograph is a direct proof of the validity/trueness of the unified quantum gravity theory of the universe.

A Black Hole is formed stepwise [69] as shown below schematically (Fig. 12.1)

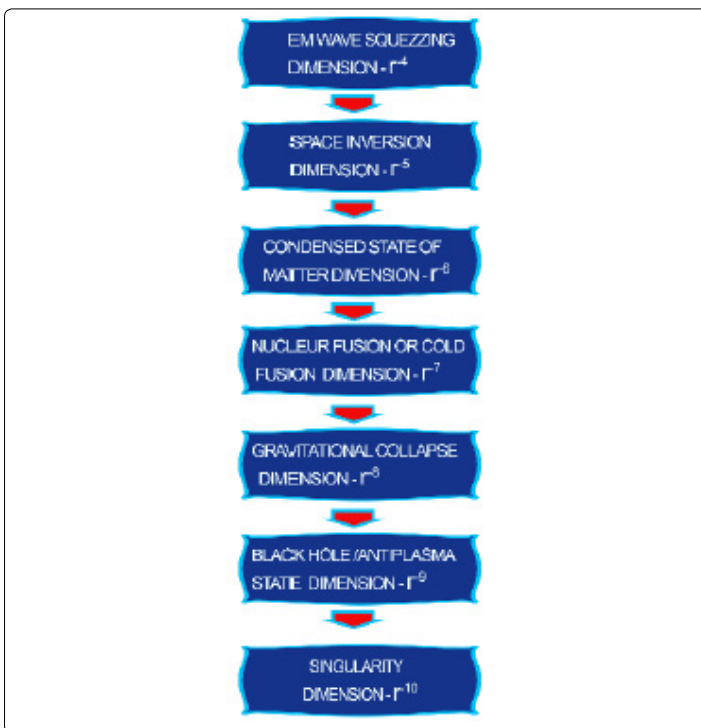


Table 12.1: Travel of ‘Graviton’ from entropy \rightarrow entropy

Singularity, Growth of Black-Hole and the Graviton Magic EM Wave Squeezing: r^4

It is the inverse phenomena of an electro-magnetic field. The electromagnetic waves are usually originated from matter and pass on to the space, but the waves are inverted, and enter the matter. The matter in the state of ‘push forward’, r^2 gets hybridized with inverse of wave (r^4) and pass on to a state of pull back or time graviton.

Space Inversion - r^5

The pull back or time gravitation attracts volume/energy towards itself and it become a hybrid of time graviton and inverse energy or 1st order mass graviton

$$r^{-2} \times r^{-3} = r^{-5}$$

So basically it is energy localization or space inversion.

Acceleration is being dimensionally, r^5 , is a space expansion and r^{-5} is space inversion.

Condensed State of Matter: Second Order Mass

The time graviton part of the space inverting vector (in the form of time graviton x first order mass graviton) draws a distance collapsing graviton (inverse of entropy) towards itself to generate another mass. So, the mass density is getting doubled. If we compare the ‘space inverting’ and ‘condensed state’ formation phenomena, a time graviton in the former is being replaced by a mass graviton in the latter. Hence the mass density get doubled

$$r^{-2} \times r^{-3} \xrightarrow{r^{-1}} r^{-3} \times r^{-3}$$

Nuclear Fusion – r^7

Due to the effect of space inversion or localization of energy and increase of density (or situation of 2nd degree mass), the two mass gravitons, get fused to each other to form a single mass. This is in fact nuclear fusion reaction and is a cold fusion, in fact. Due to the mass defect phenomena (as already elaborated in section 7.2) large amount of energy is liberated. The distance collapsing graviton enforces the two nos. of first degree masses to combine with each other. The liberated energies are transferred to the space which is shown in Fig.12.2.1.a and 12.2.1.b below.

Gravitational Collapse – r^8

Gravitational collapse [70] is the attack of a distance collapsing graviton on the fused masses.

The fused masses are of higher dimensional masses, and thus exert a strong gravitational pull on the space. So, a net result is the shrinkage of the masses

$$\frac{1}{r^7} \times \frac{1}{r} = r^{-8}$$

The high gravitational pull back abstracts an anti-entropy graviton to reach to a stage of gravitational collapse.

Black-Hole – r^9 Anti-plasma or Black-Hole Graviton

At the stage of gravitational collapse the evolved situation, is shown in Fig.12.2.1. The 3-dimension saddles abstract another anti-entropy graviton to form a Black-Hole. Black-Hole is a third degree mass situation and that too of, higher dimensionality masses. The geometrical shape of the Black-Hole as shown in Fig. 12.2.1, reveals why they are Black “Holes”.

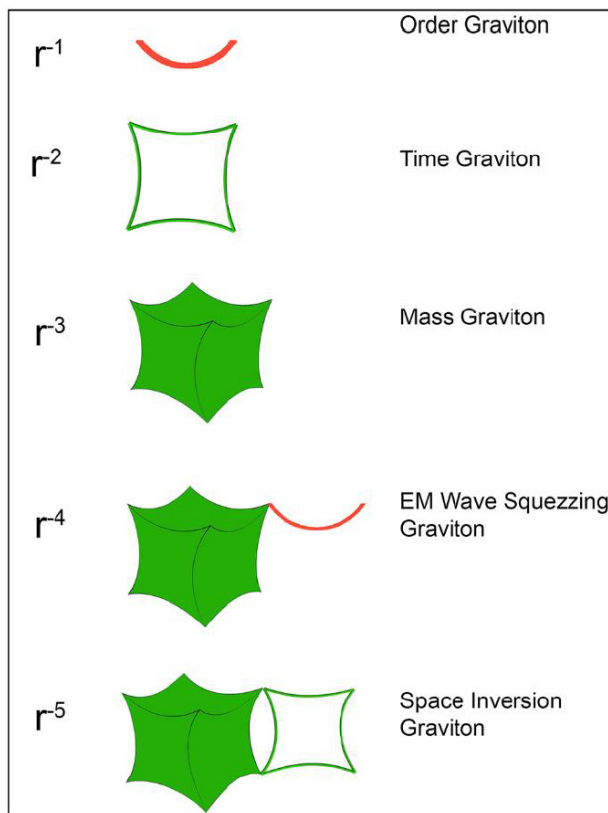


Figure 12.1: Schematic representation of formation of Black Hole and singularity

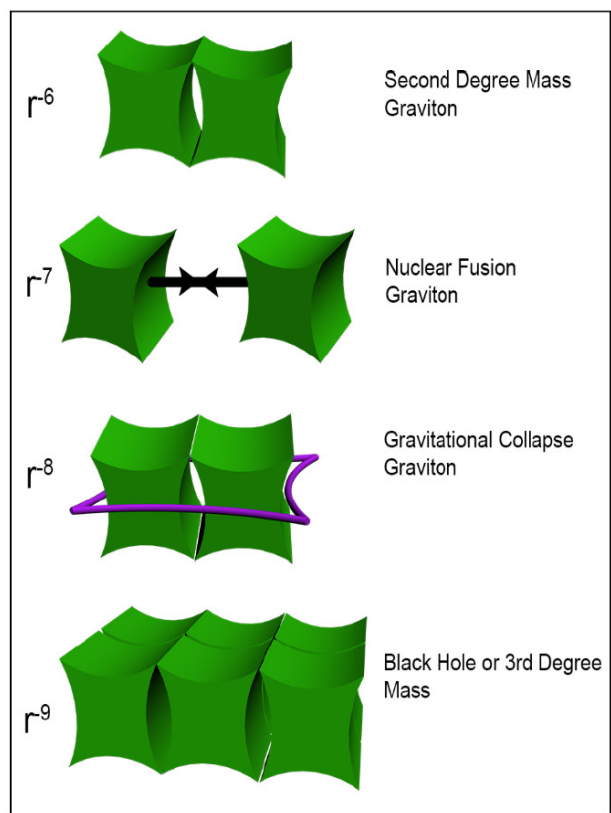


Figure 12.2.1.a: Presentation of Pull-Back Gravitons

The Holes are the interstitial spaces in the 3rd degree masses. As shown in Fig.12.2.1, all through tunnels do exist in the Black-Hole, straight away to the opposite surface. Suppose a person is walking through a path and encounters a giant high hill in front of him. The person then has to cross the hill, to walk up to the uphill and then come down, a very long walk indeed. If the hill is a Black-Hole type, then the person can walk through the holes or tunnels to reach to the other end of the hill and the distance the person has to walk,

is much less than going uphill and downhill sum total distance.

12.3 Different types of Black-Holes and their Geometry and Thermodynamics

In the literature, it has been cited that there exists four different types of Black-Holes. Unified QG theory predicts that Black-Holes are of 9-dimensionalities (r^9). The existences of the above said Black-Holes are very much possible, from QG Theory consideration, as shown in Table 12.3.1 below.

Table 12.3.1: Break-up of the dimensionality of the different types of Black-Hole

Sl. No.	Black Hole Name	Black Hole Type	Break-up of Dimensionality
1	SCHWARZSCHILD (SC)	Possesses only mass	$\frac{1}{r^9} = \frac{1}{(r^3)^3} = \frac{1}{R_1^3} (R_1 = r^3)$
2	KERR [71] (KR)	Possesses mass and angular momentum	$\frac{1}{r^9} = \frac{1}{r^{10}} \times r = \frac{1}{(r^{\frac{10}{3}})^3} \times r = \frac{1}{(R_2)^3} \times r [R_2 = r^{\frac{10}{3}}]$ We have shown that the dimensionality of angular momentum is $(mvr = 3r)3r$.
3	KERR-NEWMAN [72] (KRN)	Possesses mass, charge, and angular momentum	$\frac{1}{r^9} = \frac{1}{r^{12}} \times r^2 \times r = \frac{1}{(r^4)^3} \cdot r^3$ $= \frac{1}{(R_3)^3} \cdot r^3 [r^4 = R_3]$ $r^2 = \text{charge, as defined in QG Theory.}$
4	REISZENER-NORDSTU [73,74](RN)	Possesses mass and charge	$\frac{1}{r^9} = \frac{1}{r^{11}} \times r^2 = \frac{1}{(r^{11/3})^3} \times r^2 = \frac{1}{(R_3)^3} \times r^2 [R_4 = (r^{11/3})]$

So, Schwarzschild Black-Hole = (3rd degree Mass)

KERR Black-Hole = (Mass) x (entropy)

REISZENER-NORDSTU Black-Hole = (Mass) x (force) = (Mass) x (Entropy)²

KERR-NEWMAN Black-Hole = (Mass) x (energy) = (Mass) x (entropy)³.

Where and how the ‘Holes’ of a Black-Hole are placed or situated on a Black-Hole has never been cited in the literature.

The ‘SC’ Black- Hole is the most primitive or the most cohesive one. The order of cohesiveness of the different types of Black – Holes are in the following order:

$$SC > KR > RN > KRN$$

The index of ‘r’ (in R..portion) in SC, KR, RN & KRN are 1, 3.33, 3.66 & 4 respectively. Higher index of ‘r’ in a Black – Hole signifies lesser cohesive Black- Holes.

A SC Black –Hole to KRN Black-Hole equilibrium can be expressed mathematically as shown below:

$$\frac{1}{(r^{10/9})^9} x r = \frac{1}{(r^{11/9})^9} x r^2 = \frac{1}{(r^{4/3})^9} x r^2 x r =$$

$$\frac{1}{(r^1)^9} = \frac{1}{(r^{1.11})^9} x r = \frac{1}{(r^{1.22})^9} x r^2 = \frac{1}{(r^{1.33})^9} x r^2 x r$$

SC KR RN KRN

The above equilibrium relationship not only proves that a SC Black – hole can remain in equilibrium with all other types of proposed Black –Holes but also, the SC Black – Holes are the most cohesive among the all.

Now in the stage of nuclear fusion, the enormous energy which is generated, start transporting to the surface of the Black-Hole forming entity. When the Black-Hole is fully formed, the inside becomes too cold (energy being highly localized in the form of masses) and the energy by this time reaches the event horizon of the ‘Black-Hole and starts radiating from the event horizon as EM waves. These waves are the Hawkins radiation. Since the origin of the wave is in the core of the Black-Hole and is transported to the surface, it contains the information too.

So, the present model removes the ‘PARADOX’ of contradiction between ‘Information system’ and Hawkins’s, radiation from the outer surface of the event horizon.

The Black-Holes can further absorb mass and pass on to an yet smaller size Black-Hole. Black-Hole in the form of r^{-9} when absorbs further mass, it dimensionally reaches to $r^{-9} \times r^3 = r^{-12}$ and the Black-Hole is also reduced in size.

Suppose two masses, each of magnitude $\frac{9}{4\pi r^3}$ combines to form a mass

$$2 x \frac{9}{4\pi r^3} = \frac{18}{4\pi r^3} . \tag{12.3.1}$$

$$\text{Now } \frac{18}{4\pi r^3} = \frac{9}{4\pi \left(\frac{r}{2^{1/3}}\right)^3} = \frac{9}{4\pi R^3} \tag{12.3.2}$$

Since $R = r/2^{1/3}$. So $R < r$ and hence the radius of the fused masses are lower than the radius value before fusion. So more the masses, the Black-Hole absorbs, more and more energy is generated, and the Black- Holes also do diminish in size. This process is in fact ‘Black-Hole evaporation’ and this way a Black-Hole transforms from large size to medium size to micro size and ultimately gets vanished.

The nuclear fusion reaction, occurring during the formation of a Black-Hole is in fact, cold fusions. This is a very much controversial subject and once had stormed the entire scientific community of this world in the late 20th century.

The unified theory predicts that the ‘cold fusion’ is a true phenomenon of the universe and under no circumstances it can be, or was an experimental artifact.

Now let us examine what Hubble’s space is, truly. Hubble’s constant is kilometer per second per mega-per-sec. A mega-per-sec is 3.26 million light year.

The Hubble’s law is expressed as [75]

$$V = H_0 D \tag{12.3.3}$$

Where H_0 is constant of proportionality and D is the distance of a galaxy.

Now basically the Hubble’s constant in the form of equation (12.3.3), is a ‘Push forward’ phenomenon

$$H_0 = \frac{v}{D} = \frac{\text{velocity}}{\text{distance}} = \frac{\text{volume}}{\text{distance}} = \frac{r^3}{r} = r^2 \tag{12.3.4}$$

So it is basically a ‘Push forward’ or force and reciprocal of Hubble’s constant is, time. So far away the galaxies are from a reference point or origin, higher are their volumes, and time is lesser and lesser. This is shown diagrammatically the figure 12.3.1. The center of the universe is O, where the volume is the least and the time is the maximum. The faraway the Galaxies are G1, G2, G3, G4, G5,... G_∞ as the volume increases and the time decreases.

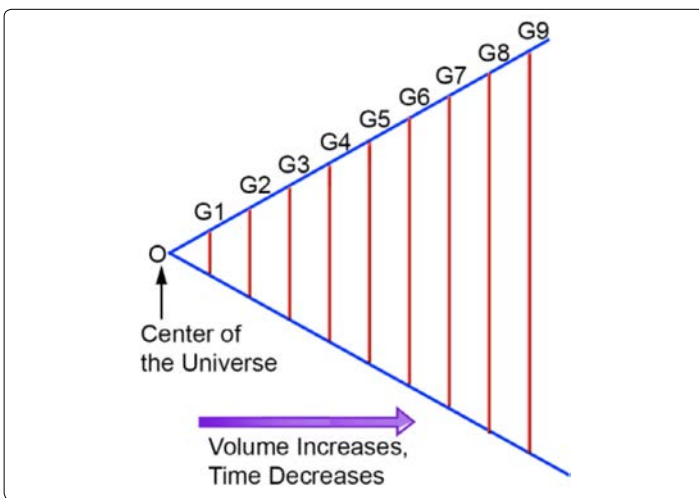


Figure 12.3.1: Diagram showing the far distance Galaxies from the center of the universe. 'O'

13. Delocalization and localizations of masses and energies and origin of space expansion, space inversion, temperature and time

When a matter expands, the delocalization of the masses (DLM) and the energies (DLE) occur simultaneously. On the contrary, during inversion of matter, the localization of masses (LCA) and localization of energy (LCE) take place together.

Rate of delocalization of mass or rate of delocalization of energy can be calculated as the rate of generation of energy, i.e., E/t .

$$\text{Now } \frac{E}{t} = \frac{4\pi r^3}{\frac{3}{4\pi r^2}} = \frac{16\pi^2 r^5}{9} \quad (13.1)$$

So $\left(\frac{16\pi^2 r^5}{9}\right)$ represents both the energy and mass delocalization. When, both mass and energy delocalizes simultaneously, the masses decrease and the energies or the volume increase. So, $\left(\frac{16\pi^2 r^5}{9}\right)$ basically represents 'space expansion' or 'expansion of space'. So, 'space inversion' or 'inversion of space' would be represented as the reciprocal of $\left(\frac{16\pi^2 r^5}{9}\right)$, and which is $\left(\frac{9}{16\pi^2 r^5}\right)$ and this represents localization of energy and mass (mass increase) and hence in 'space inversion'.

What then is 'entropy' r and 'inverse of entropy' r^{-1} ? These are related to mass and it will be discussed in the following paragraph.

The space expansion can also be considered as the rate of change of volume with time or simply as "Push forward" of volumes.

Space expansion :

$$\begin{aligned} \text{Push forward of volume} &= \text{volume} \times \text{push forward force} \\ &= \frac{4}{3}\pi r^3 \times \frac{4}{3}\pi r^2 \\ &= \frac{16\pi^2 r^5}{9} \end{aligned} \quad (13.2)$$

In case of pull back of volume, both volume and push forward variables do inverse

Space inversion = pull back of volume

$$\begin{aligned} &= \frac{1}{\text{volum}} \times \frac{1}{\text{push forward forces}} \\ &= \frac{3}{4\pi r^3} \times \text{pull back force} \\ &= \frac{3}{4\pi r^3} \times \frac{3}{4\pi r^2} = \frac{9}{16\pi^2 r^5} \end{aligned} \quad (13.3)$$

Now let us examine the true significance of entropy (degree of randomness), and inverse of entropy (degree of order).

One can visualize mass as a hybrid of three inverting and collapsing distances in the three dimensions (see Fig.13.1)

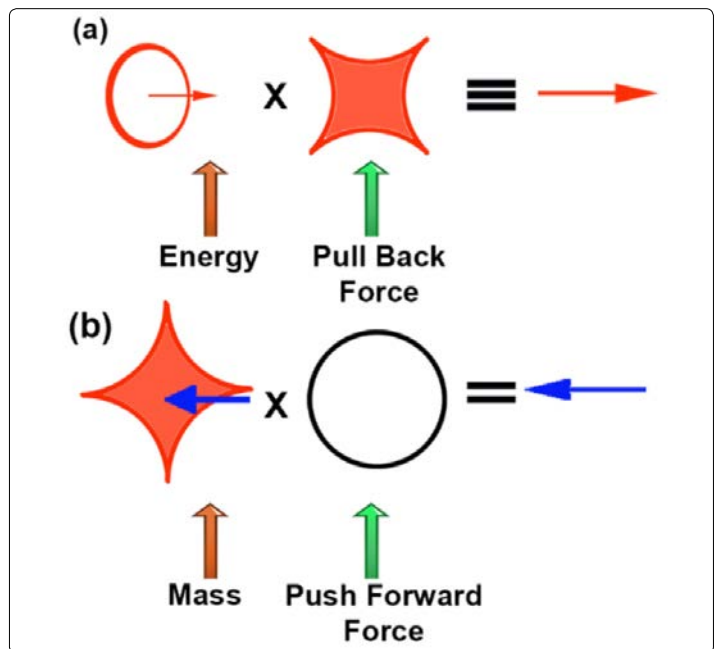


Figure 13.1: Creation of (a) distance/entropy graviton and (b) collapsing distance graviton from 'Energy-Pull Back' and 'Mass-Push forward Hybrid'

When a mass is acted by a push forward force, the push forward circle swallows the saddle A in figure 13.1 (being the multiplicative inverse of it) and so, one is left with an inverting or collapsing distance and which is dimensionally $\frac{1}{r}$ or the degree of order. So degree of order is the push forward of mass

$$\text{Mass} \times \text{push forward} = \frac{9}{4\pi r^3} \times \frac{4}{3}\pi r^2 = \frac{3}{r}$$

Now when energy is being pulled-back (which is the inverse of 'mass push forward force'), the situation is also shown in the figure 13.1. So in this case the pull back force or the 'time graviton' swallows the circle. So one is left with an expanding distance, which is nothing but 'entropy'.

Now unified theory defines the true definition of temperature and time

$$\frac{16\pi^2 r^5}{9} x \frac{3}{r} = 3 \left(\frac{4}{3} \pi r^2 \right)^2 = 3T^2 \quad (13.4)$$

So, space expansion x degree of order = $3T^2$ (13.5)

Or, $\left(\frac{\text{space expansion} \times \text{degree of order}}{3} \right)^{1/2}$ (13.6)

Or space inversion x entropy = $3t^2$

or time $t = \left(\frac{\text{space inversion} \times \text{degree of randomness}}{3} \right)^{1/2}$

So, temperature is a sort of geometric mean of space expansion (delocalization of mass and energy) and degree of order. Space expansion is trying to be boundless being in the form of r^5 , but degree of order being in the form of $\frac{3}{r}$ is holding it. Also it can be stated that the degree of order is attempting to go higher and higher, but space expansion does not allow so. Typically, both are bound by each other - as a result, temperature also has a lower and upper limit too.

Time is a sort of geometric mean of space inversion and entropy. Space inversion may try to attain higher and higher values but entropy (the degree of randomness) will never allow it to happen. Also it can be stated that entropy is trying to go higher and higher but space inversion will not allow it.

Again one has to reach to a conclusion that neither entropy can be boundless nor the space inversion.

14. Mass defect, special theory of relativity vis-a-vis gravitons

It is often cited in the literature that a ‘‘Graviton’’, if it does exist at all, are mass less and charge less particles. The unified theory have revealed the ‘Gravitons’ in a different way, altogether. It needs some more discussion on the conventional thoughts. The non-appropriate conclusions drawn by the scientists have originated from the miss-concepts about the universe.

Time is a distance and is increasing

Gravitational constant of Newton, G is in the form, which is just reverse to what Gravitation is, and people try to analyze the gravitation in the reverse fashion.

Once the above said miss-concepts are removed from the mind, we get the true picture about gravitons.

As a matter of fact so many different types of gravitons do exist as has been shown and out of them, only the mass gravitons are in the form of particles and we are handling day to day with these mass graviton. The other gravitons are either in the form of distance, area, force, charge... and are not in the form of particles or mass.

In the literature [76] (work of Haranas and Gkigkinizis) the mass of the gravitons (m_{gr}) and information, N has been shown to be inversely proportional to time ($m_{gr} \propto \frac{1}{t}$) and square of time ($N \propto t^2$) respectively. Again, they have as usual considered the conventional concept of time. Once this is corrected and is considered truly as diminishing phenomena with the expansion of the universe, then the conclusion made by the said authors would just have to be reversed. Then the mass graviton and information system will become

$$M_{gr} \propto t \quad \text{and} \quad N \propto \frac{1}{t^2} \quad (14.1)$$

Since t is diminishing, at the instant of the birth of the universe, the masses of the gravitons were too high and the information was too low. The m_{gr} decreases with time and information increases with time. This is the actual scenario.

The authors have calculated the mass graviton and the information from the following equation

$$\frac{1}{\lambda_{gr}^2} = \frac{2\Lambda}{3} = \frac{m_{gr}^2 c^2}{h^2} \quad (14.2)$$

$$m_{gr} = \frac{h}{c} \sqrt{\frac{2\Lambda}{3}} \quad (14.3)$$

$$N = \frac{(Mc^2)}{hH} \quad (14.4)$$

Now Λ = cosmological constant

λ_{gr} = wave length of graviton

C = velocity of light

h = reduced Planck’s constant

N = nos. of information

M = Mass of the system

H = Hubble’s constant

If we put the unified theory derived dimension of the variables in the above Eqns.(14.1) to (14.4), we get

$$\Lambda = \frac{1}{r^2} \quad (14.5)$$

$$m_{gr} = \frac{r}{r^3} \sqrt{\frac{1}{r^2} - \frac{r}{r^4} - \frac{1}{r^3}} \quad (14.6)$$

$$N = \frac{1}{r^3} x \frac{1}{r} x \frac{r^6}{r^2} = r^6/r^6 = r^0 \quad (14.7)$$

So the mass of the graviton emerges as the dimension of mass of the QG theory. The said authors have dealt with mass only. So there are no reasons to consider the mass graviton to be extremely lower masses particles and which does not make a sense either.

The information(N) is found to be dimensionless, since these are numbers only. At the birth of the universe, the mass gravitons

were of extremely high magnitude. These masses are decreasing as the universe expands, due to the delocalization of mass. Since it is shown $N \propto \frac{1}{t^2}$, as the universe expands, the information are increasing too fast. In the said article, a parameter S_g , has been shown as the entropy of the graviton. Actually, it is the entropy graviton. It has been shown to be related to the Boltzmann constant, in the following way :

$$S_r = k_B \log_2(2^N) \quad (14.8)$$

k_B is the Boltzmann constant and N being the information. As it has already been shown, that the Boltzmann constant has a dimensionality of r . So S_r is nothing but a entropy graviton, as it turns out, since N is dimensionless.

Mass defect is a phenomena related to the following

- i) Increase of uncertainty of volume of position due to the coalescence of the two number of masses.
- ii) The higher uncertainty in position and volume leads to higher entropy
- iii) Mass $\propto \frac{1}{(entropy)^3}$, and since the entropy increases, the fused masses has to diminish in their magnitudes to maintain the mass-energy equivalence, $mE = 9$.

This is diagrammatically shown in Fig.14.1 two masses in equilibrium with energy, as usual, and two masses of the same magnitude are fused together to form a single mass.

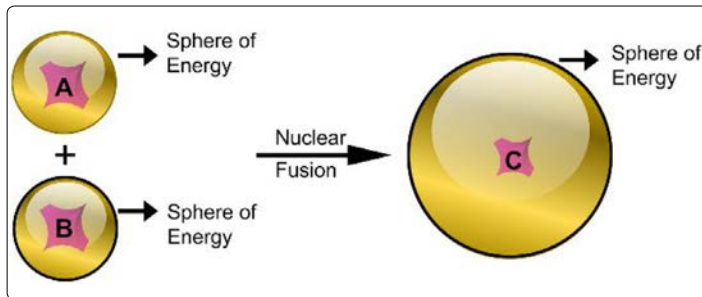


Figure 14.1: Representation of Mass defect. Two Masses 'A' & 'B' same magnitudes are fused to form a higher magnitude Mass 'C'

In figure 14.1, the fusion process has been shown in 2-dimension to make the understanding simple.

The two nos. of masses after fusion offers on an average a higher level of entropy than before fusion.

When the two number volumes combined to form one volume (the masses remaining within it

$$\frac{4}{3} \pi r^3 + \frac{4}{3} \pi r^3 \quad (r \text{ is the radius}) \quad (14.9)$$

$$= \frac{8\pi r^3}{3} = \frac{4\pi}{3} (2^{1/3}r)^3 = \frac{4\pi}{3} (r')^3 \quad (14.10)$$

So $r' = 2^{1/3}r$ and $r' > r$. So the energy of the fused masses is in a higher state than before fusion. So energy in the form of $4\pi r^3$, will also be higher.

Now this is a situation, where both mass and energy, do increase simultaneously, and which is not allowed by mass-energy equivalence in the form of $mE = 9$.

$$\text{Now since mass} = \frac{1}{(entropy)^3} \quad (14.11)$$

So, due to the increased entropy of the fused masses, the two number of masses after fusion will decrease to a certain extent and gets converted to energy. So entropy is increased, mass is lowered and energy is increased, and the mass-energy equivalence equation is not being affected. So mass defect is not arising out the way people depict is originated from Albert Einstein's mass-energy equation $E = mc^2$.

$$\begin{aligned} \text{Now 1st degree energy graviton } (E)(r^3) &= 1^{\text{st}} \text{ degree mass (m) graviton} \times (1^{\text{st}} \text{ degree volume of graviton})^2 \\ &= \frac{1}{r^3} \times r^6 \end{aligned} \quad (14.12)$$

$$\text{So } E = mV^2 \quad (14.13)$$

$$\begin{aligned} \text{So, 2nd degree energy } (E')(r'^6) &= 2^{\text{nd}} \text{ degree mass graviton} \times (2^{\text{nd}} \text{ degree volume graviton})^2 \\ &= \frac{1}{r'^6} \times (r'^6)^2 \end{aligned} \quad (14.4)$$

$$\text{So, } E' = m'V'^2 \quad (14.15)$$

$$\begin{aligned} \text{3rd degree energy graviton } (E'')(r''^3) &= 3^{\text{rd}} \text{ degree mass graviton (m'')} \times (3^{\text{rd}} \text{ degree volume gravitation } V'')^2 \\ &= m''V''^2 \end{aligned}$$

$$\begin{aligned} \text{So the general expression for energy appears to be} \\ E = mV^2 = mV.V = 3V \end{aligned} \quad (14.16)$$

The energy mass equation put forward by Albert Einstein is not the appropriate one, once we consider the proper dimension of mass, time and consider the graviton- anti-graviton phenomena.

The concept of photons needs to be abandoned now. The photons are EM wave graviton, in the form of r^4 .

Regarding the dimensionality of the universe, one can say that in the integrated form it is 10-dimensional (r^{10}) but if unfolding of

the dimensions of a singularity are done one after another, and the evolved dimensions (r 's) are put side by side one after another along a straight line, for example, one will land up to situation of a flat universe.

The universe in a very differential form turns to a "FLAT UNIVERSE" [77]. The graviton-anti graviton phenomena is a cyclic phenomenon. The cycle starts with an entropy graviton and ends up again with generation of entropy. This universe is just like a Carnot engine. The Carnot engine generates entropy at its first cycle and at the 3rd cycle/step (isothermal compression) returns the entropy and which drives a vehicle forward. So one can state

"A CARNOT ENGINE IS A REPLICA OF THE UNIVERSE OR THE UNIVERSE IS A REPLICA OF A CARNOT ENGINE"

15. SPECIAL THEORY OF RELATIVITY AND QG THEORY

There do exist, ten different gravitons in this universe, as it had already been shown. The different gravitons are in equilibrium with their anti-graviton. As a result, none of them can be boundless, in magnitude. The graviton-anti-graviton are conjugate pairs. This is shown below

Table 15.1. 'Push forward Graviton-Pull back graviton' conjugate pairs.

Sl. No.	Type of Anti Graviton		Type of Graviton
1	DISTANCE COLLAPSING GRAVITON OR ORDER GRAVITON (r^{-1})	\Leftrightarrow	ENTROPY GRAVITON, INDEX OF RANDOMNESS, VOLTAGE/POTENTIAL DIFFERENCE(r^1)
2	TIME GRAVITON, VISCOSITY, MAGNETIC POTENTIAL (r^{-2})	\Leftrightarrow	FORCE, TEMPERATURE, CHARGE(r^2)
3.	MASS GRAVITON(r^{-3})	\Leftrightarrow	ENERGY GRAVITON, INTENSITY, VOLUME(r^3)
4	INVERSE MAGNETIC FIELD(r^{-4})	\Leftrightarrow	EM WAVE GRAVITON/SO CALLED PHOTONS(r^4)
5	SPACE INVERSION, INDUCTANCE, MASS LOCALISATION, COLOR GRAVITON OF OBJECT IN MASS FORM(r^{-5})*	\Leftrightarrow	SPACE EXPANSION, DELOCALISATION OF MASS, COLOR GRAVITON IN EM WAVE FORM(r^5)*
6	CONDENSED STATE MASS GRAVITON OR SECOND DEGREE MASS GRAVITON(r^{-6})	\Leftrightarrow	2 ND DEGREE ENERGY GRAVITON, PHOTO-ELECTRICITY(r^6)
7	NUCLEAR FUSION GRAVITON(r^{-7})	\Leftrightarrow	NUCLEAR FISSION GRAVITON(r^7)
8	GRAVITATIONAL COLLAPSE GRAVITON(r^{-8})	\Leftrightarrow	X-RAY, GAMMA RAY GRAVITON(r^8)
9	BLACK HOLE GRAVITON(r^{-9})	\Leftrightarrow	3 RD ORDER ENERGY, PLASMA STATE GRAVITON(r^{-9})
10	SUPERENTROPIC/SINGULARITY GRAVITON(r^{-10})	\Leftrightarrow	ANTI-GRAVITY OR SUPERNOVA(r^{-10})

* - The dimensionality of color has been derived in color physics section of this article (Sec.16).

Now when light or EM waves interact with gravity, the different gravitons are being evolved as shown in Table 15.2.

Table 15.2. Dimensionalities of ‘Light-Gravitation Interaction’.

Sl. No.	GRAVITON TYPE	DIMENSION OF EM WAVE/LIGHT	DIMENSIONALITY OF THE RESULTING HYBRID GRAVITON	EFFECT
1	r^{-1}	r^4	r^3	Volume/energy generation
2	r^{-2}	r^4	r^2	Push forward or force or temperature
3	r^{-3}	r^4	r	Entropy generation
4	r^{-4}	r^4	r^0	-
5	r^{-5}	r^4	r^{-1}	Distance collapsing or order
6	r^{-6}	r^4	r^{-2}	Time graviton
7	r^{-7}	r^4	r^{-3}	First degree mass graviton
8	r^{-8}	r^4	r^{-4}	Inverse magnetic field
9	r^{-9}	r^4	r^{-5}	Space inversion or energy and mass localization
10	r^{-10}	r^4	r^{-6}	Second degree mass generation or 3 rd degree time graviton.

The resultants of light- gravitation interaction in sl. no.1 to 3 in Table 15.2 are repulsive or dissociative type. But from sl. No.5 to 10 are attractive phenomena and are very strong ones. As a result, the light waves do bend towards the gravitational field during solar eclipse.

15.1 Limitations of Special Theory of Relativity

The following three main postulates of the theory of special relativity [78] have very little validity, once the concepts of unified theory are showered upon them.

“The laws of Physics are invariant for all frames” This universe is a hybrid, integrated universe and is resting on ‘Graviton-anti-graviton’, cycle so the concept of different frames are not very meaningful. Once the concept of frame does not get a shape, the variance or invariance of the physical laws are not much meaningful.

The universe is expanding so there does exist an acceleration (or space expansion) at each and every point of the universe at any instant. So the idea of non-accelerating frames does not stand either.

The speed of light is same, in all the frames irrespective of the speed of the light source. Now what is meant by the term ‘light’? If it intends to mean the entire range of EM radiation, then the different types of waves, like Microwave, IR, UV visible, X-ray, Gamma ray,... etc. belong to different energy levels and accordingly do have own different values of ‘ r ’ or wave length. So the volumes the different waves they given rise to are different. Since the variable ‘velocity’ is not a meaningful variable of the universe, so the conclusion ‘invariant velocity of light’ has no real significance.

Now the very famous equation $E = mc^2$, what does this equation take us to, will be reviewed now.

Albert Einstein had never taken an attempt to define the true dimensionality of the three most important physical variables of the universe, i.e. mass, time and temperature. The work of the great scientists starting from Newton to Max Planck to de Broglie to Heisenberg to Einstein, are based on mathematical modeling of the phenomenon of the universe. Based on mathematical model, they tried to conceptualize the phenomenon's. The mysteries of the universe can be revealed in a much better fashion by developing the physical concepts first, and then modeling them by mathematics. Einstein's following equation of mass-energy can be rearranged as

$$\frac{E}{m} = c^2 = \text{constant} \quad (15.1.1)$$

So $E = m \times \text{constant}$ (15.1.2)

If E is y and m is x then the above Eqn.(15.1.1) turns into an equation of straight line passing through the origin $y = mx$

So at the point of origin, both y and x have 0 values or mass and energy both are zero. The y and x or energy and mass are directly proportional to each other.

When the mass increases, energy also does increase. When the mass decreases the energy also does decrease. But the reality is just the reverse. In the mass rich zone (a Black-Hole) the energies are vanishingly small. On the contrary, in the energy rich zone, the masses are small, as in a plasma state (Fig.15.1.1 of mass-energy equivalence).

In the case of plasma state, masses are vanishingly smaller while the energies are very high.

In the form of energy-mass equivalence of Albert Einstein's $E = mc^2$, in one fine morning the entire universe could have merged to a single mass or the entire masses could have transferred to energy. These are the so called situation of absolute certainty and absolute uncertainty and both such phenomena are, however, non-existent. Both mass and energy are lower and upper bound variable. So $E = mc^2$ is a non-appropriate equation of mass-energy equivalence.

To the end, the author feels strongly to comment, that the scientific community was not aware of either the true dimension of mass, or the energy as well. Under this situation it is surprising to understand, how this proposition of $E = mc^2$, the world scientific community had accepted?

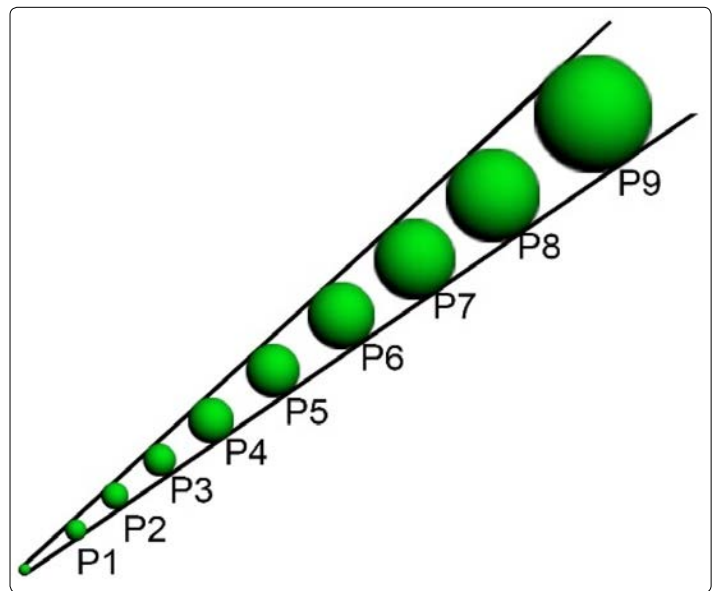


Figure 15.1.1: Schematic representation of the Hubble space of the universe

The universe is being considered as a sphere as shown in the form of Hubble's Space in figure 15.1.1.

The O is the center of the universe and $P_1, P_2, P_3, P_4, \dots$ etc. are the expanding space region or zones. So the volumes of the zones V_{P_i} will be in the order.

$$V_{P_\infty} > \dots > V_{P_8} > V_{P_7} > V_{P_6} > V_{P_5} > V_{P_4} > V_{P_3} > V_{P_2} > V_{P_1} \quad (15.1.3)$$

So as we progressively move away from the center of the universe, the acceleration is more and the space expands and expands. The concept of rest inertial frame or the 'steady velocity' inertial frames do not have much relevant to the reality. The origin O is also not at rest (molecular motions in the form of translation, rotation, vibration are always there). The concept of rest mass of Einstein does not stand.

The relative masses of the zones in figure 15.1.1 m_{P_i} is in the order

$$m_{P_\infty} < \dots < m_{P_8} < m_{P_7} < m_{P_6} < m_{P_5} < m_{P_4} \dots \quad (15.1.4)$$

The mass at the origin O is the highest. So this is what is Einstein's 'mass dilation'

The order of time is

$$(t_{P_1}) t_{P_\infty} < \dots < t_{P_8} < t_{P_6} < t_{P_5} < t_{P_4} \dots \quad (15.1.5)$$

So this is time dilation. The time is highest at the center O and it does progressively falls off. A person standing at the origin O, will feel that with respect to his own time and mass, the mass and time of the other zones are progressively becoming lower and lower. So for the person standing at origin O, as if, the mass and the time are dilated relatively than the other zones. The reverse is true for the person standing at P_8 and his feeling will be just the reverse, that time and mass are both much lower with respect to P_0 .

The order of the relative size of the molecules of the zones S_{P_i})

$$S_{P_{\infty}} > \dots S_{P_8} > S_{P_6} > S_{P_5} > S_{P_4} \quad (15.1.6)$$

The relative intermolecular distances r_{P_i} or entropy

$$r_{P_{\infty}} > \dots r_{P_8} > r_{P_6} > r_{P_5} > r_{P_4} \dots \quad (15.1.7)$$

So this is the so called, length contraction of Einstein.

So Einstein's theory of relativity lies more in the dimension of length and sizes/volumes, attractive forces among the molecules of the different zones, rather than the velocity of the zones. Now regarding electromagnetic radiation emerging from the different frames, their volumes would be different for the different zones. The reason is, EM waves are 'energy-entropy' hybrids and since both are increasing, as we go away from the origin, the relative volumes of the electromagnetic radiations of the zones, go on increasing. It follows the same patterns as that of the pattern of volume of the zones.

So the special relativity consideration of the constancy of the velocity of the electromagnetic radiation of the various inertial frames is also being abandoned.

Now let us examine Newton's laws of motion in the light of the unified theory. Newton's first law says, if no force is applied on a body from an external source, which is at rest, it will remain at rest forever. Now, nothing in this universe is at rest. One may observe that a body is lying at a rest position. This is an apparent macroscopic observation, but if the atoms and molecules of the object are considered there does exist innumerable motions, like rotation of the electron in their orbits, the rotational motion of the atoms and molecules, the rotation of the nucleus and over and above the object has got some entropy.

Entropy means randomness and randomness's are generated from the multi-various motions. So, the concept of a 'body at rest' is not at all significant, and as well, the term 'rest mass' does not stand too. The kinetic energy of a body at rest is considered to be zero, but any type of motion always give rise to some kinetic energy always.

Now, for a body which is moving at a constant velocity will continue along a straight line for ever, if no external force is being applied, as Newton has cited. The universe is characterized by the random motions of the atoms and molecules or characterized by entropy, so linear motion along a straight line is something which is an absurdity.

Regarding the uniform velocity of the body, it is also not a justified proposition on the ground of the logic of every point in the universe, has got some acceleration always. As we go away more and more from the center of the universe, the said acceleration does increase. So invariant velocity of a body for ever is nothing but turns out to be a myth.

15.2 Limitations of The Newton's Laws of Motion

In second law of motion of Newton it has been cited, that a force is directly proportional to the rate of change of momentum, but the 'momentum' has been said to be a conserved variable of the universe. So these are two contradictory propositions. Although the representation of force, as a hybrid of mass and acceleration, is fully correct but it is no way connected to rate of change of momentum. In figure 15.2.1 below, the hybrid of mass and acceleration is shown diagrammatically.

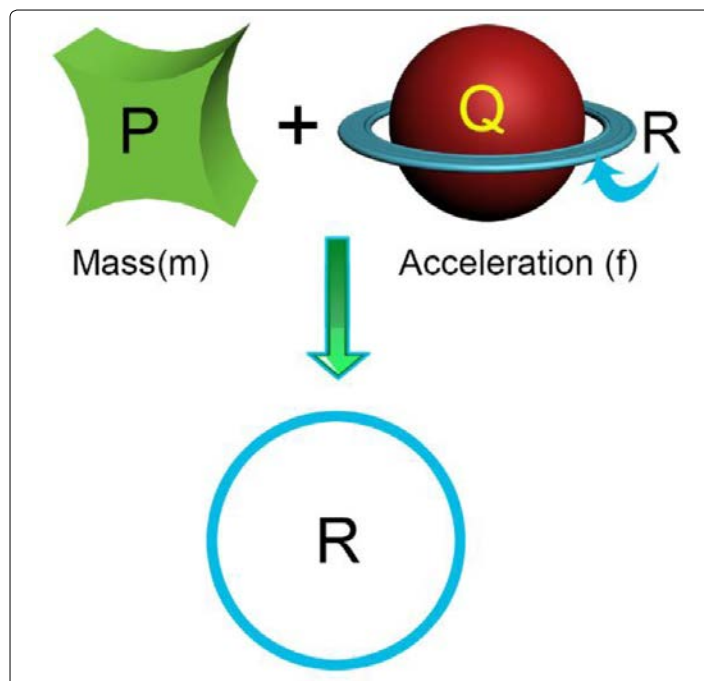


Figure 15.2.1: Mass and space expansion (acceleration) interaction to produce force

As a matter of fact the space is trying to expand in the form of space expansion graviton, but the mass graviton being a pull-back graviton is trying to swallow the energy graviton (the conjugate pair and dimensionally just inverse to each other) but, it is the force graviton, which is surrounding the energy graviton, is resisting this. But the moment these two gravitons (mass and space expansion gravitons) hybridize, the graviton which is left is the force graviton. So the underneath truth which emerges from this is that, the universal 'force graviton' are always existing in the nature/universe and as a result the universe is expanding.

So although Newton's equation for force in the form of mass and acceleration hybrid is dimensionally correct and can be used to handle many problems in real life, but co-relating it to rate of change of momentum does not reveal the truth underneath. It is due to the presence of force graviton in the universe/nature, the spaces are expanding. Otherwise the mass gravitons would have fully arrested the energy gravitons, and universe would not have expanded. So, expressing force as a hybrid of mass and accelerations is a direct proof of the existences of force gravitons in nature.

The simplest way of the non-appropriateness of Newton's approach to explain force as a hybrid of mass and acceleration, can be understood from the following explanation. The Force-acceleration equation of Newton in the following form

$$\text{Force} = \text{Mass} \times \text{acceleration}$$

has to be viewed in a different angles as :

$$\text{Acceleration or space expansion} = \frac{\text{Force}}{\text{Mass}}$$

This means, when the force overcomes the mass, there is acceleration or space expansion. The force insists the dimensionality of mass to be inverted and joins the hand of force, and as a result, there is acceleration or space expansion. The expression of force can be written as

$$\frac{1}{\text{Acceleration}} = \frac{\text{Mass}}{\text{Force}} = \text{space inversion}$$

The expression of force in this form, clearly indicates that when mass overcomes force, the mass insists the dimensionality of force to get inverted, and as a result there is a space inversion or inverse acceleration.

Newton's third law misses a very important variable 'time' from the proposition. To every action there is an equal and opposite reaction – is this being true always?

Time is a very much significant factor for the equality of action and reaction.

A reversible process takes infinite time to occur and in the reversible expansion of a gas, the energy absorbed, is maximum. A reversible process is conducted infinitesimally slowly and as a result the reverse forces are generated or scope is given for the reverse forces to generate.

So, 'to every action there is an equal and opposite reaction' will be true, when it is done reversibly or infinitesimally slowly. All the happenings of the day to day practical life are irreversible in nature or they are being conducted abruptly.

A man is running or swimming, a car is being driven forward, all are the results of irreversible processes. Whenever a man tries to push a heavy object slowly by applying force, the object does not move. It is an experience of everyday life, that to make a heavy object move, one has to apply repeated sudden jerks and in such situation of sudden jerks, the time is not being provided for the reverse force to generate. As a result the irreversible displacement takes place of the body. Now, Newton's 3rd law had to contain, the term 'time', because time is related to reversibility and irreversibility and this are in turn related to the action and reaction forces. If instantaneous reaction forces would have generated, then we could have done nothing because the instantaneous reverse forces would have stopped as to move even.

Also another very important lacking of Newton's third law is not considering the masses of the two objects involved in the action-reaction process.

The reverse forces are generated by the molecules. If sufficient time is given, an equal and opposite reaction force would obviously emerge, but if it is considered that a very heavy object is applying force on a very light object, it is hard to imagine that the lighter body exert the same reaction force on the heavy object.

The number of molecules in the lighter object are much lower in number than the heavy object, and since the action reaction force is a molecule to molecule phenomena, under no circumstances, the equal and opposite reaction force can generate, since the sufficient number of molecules are not being present in the lighter object. Even infinite time is given for the reaction force to generate, it will never generate.

So Newton's 3rd law needs to be amended by incorporating two nos. of factors and those are time and number of the molecules of the mutually interacting objects.

Some work on theory of quantum gravity is found in the literature [79-88]. However the approaches are too mathematical and do heavily lack to conceptualize what the gravitation is basically.

16. COLOR PHYSICS AND GRAVITONS

Color is evolved as a result of interaction among the object, source of light and the observer [89-94]. Once the dimensionalities of the said three variables are properly identified, the dimension of color can be obtained.

16.1 Dimensionality of Color in Regard to Light-Object Interaction

The source of light is providing light waves/EM waves. So source of light is 4-dimensional. The Baryonic matters on which the light wave falls is 2-dimensional (as already described in previous section 8.2). Regarding the dimensionality of the observers, it is to be noted that the human eye receptor cells perceive color in the form of color matching functions \bar{x} , \bar{y} and \bar{z} as shown in figure 16.1.1 below

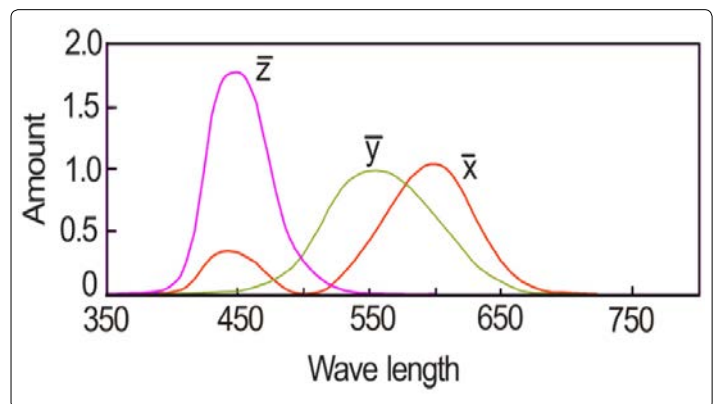


Figure 16.1.1: Graphical presentation of color matching function \bar{x} , \bar{Y} and \bar{z}

So these are EM waves too. The dimension of color would be obtained by multiplying the dimensionalities of the above said three numbers of variables, as shown below

DIMENSION OF SOURCE : r^4 (EM-WAVE)

DIMENSION OF OBJECT : r^2 (BARYONIC MATTER)

DIMENSION OF OBSERVER : r^4 (COLOUR MATCHING FUNCTION)

So the dimension of color is found as
 $r^4 \times r^2 \times r^4 = r^{10}$

The above said 10-dimensionality of color would be valid, as long as one considers, color as a composite of object (mass) and light (EM-wave).

The theory of quantum gravity depicts the color separately in object and light wave. When the color is considered in an object, it is indeed 5-dimensional, and when the color is being viewed as light wave, it is also 5-dimensional.

This phenomenon is being schematically represented in figure 16.1.2

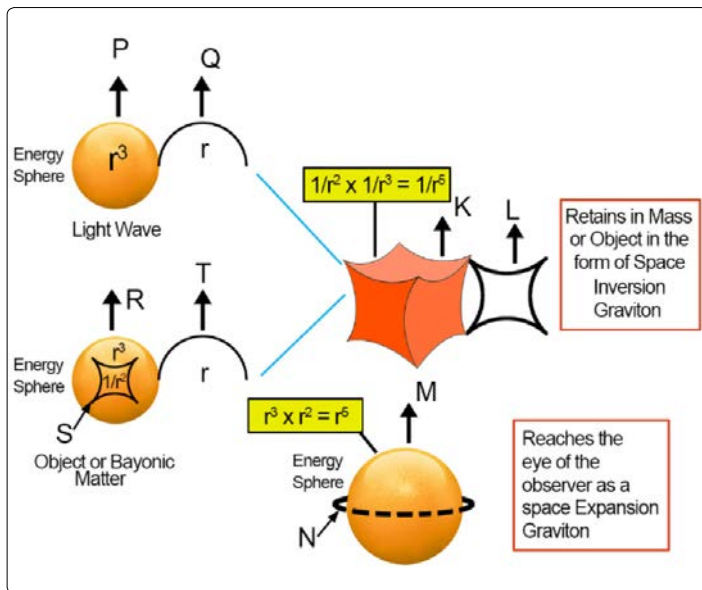


Figure 16.1.2: Evolution of color from Object – EM Wave interaction

In figure 16.1.2 it is clearly shown that when light wave falls on an object, the energy graviton of light wave inverses to form mass graviton (P → K) and that is being retained in the object. The mass graviton of the object reverses to form energy graviton (R → M). The entropy graviton of light (R) wave and the entropy graviton (T) of the object or mass get hybridized with each other to form force

graviton (N). The time graviton of object (S) and the mass graviton (K) hybridizes to each other and this inverse five (5) dimensionality, is being retained in the object as ‘object color’.

On the contrary, the energy graviton (M) and the force graviton (N) hybridizes to form the space expansion graviton and which reaches the eye of an observers as a sudden thrust, or stimuli and in the optic nerves of the eye, a perception of color is developed.

In energy dispersion form it is 5-dimensional and in mass form it is 5-dimensional too, but is inverse 5- dimensional.

16.2 Dimensionality of Color as Evolved from the Basic Definition of Color in Color Physics as an Integration of Energy Field

The color has been defined in basic color physics as a hybrid of the following parameters.

- i) Relative reflectance, $R(\lambda)$, of the object at full range of wave lengths (λ) of visible light.
- ii) Energies, $E(\lambda)$, of the source of light in the selected range of the wave length of visible light.
- iii) Color matching functions \bar{x} , \bar{y} and \bar{z} shown in Fig. 16.1.1

The integral expression of color [95] in the form of tri-stimulus value of Red (X), Green (Y) and Blue (Z), are

$$X = k \int E(\lambda) R(\lambda) \bar{x}(\lambda) d(\lambda) \quad (16.2.1)$$

$$Y = k \int E(\lambda) R(\lambda) \bar{y}(\lambda) d(\lambda) \quad (16.2.2)$$

$$Z = k \int E(\lambda) R(\lambda) \bar{z}(\lambda) d(\lambda) \quad (16.2.3)$$

Here k is the normalization constant. If dimensional analysis is being done of the Eqn (16.2.1) above, we get:

k = normalization constant = dimensionless

$$E(\lambda) = \text{energy} = r^3$$

$R(\lambda)$ = percent reflectance = dimensionless

$$\bar{x}(\lambda) = \text{wave length} = r$$

As a matter of fact, the product of, $E(\lambda)R(\lambda)$, is being introduced in the color matching functions \bar{x} , \bar{y} and \bar{z} respectively is shown in Fig.16.2.1 below.

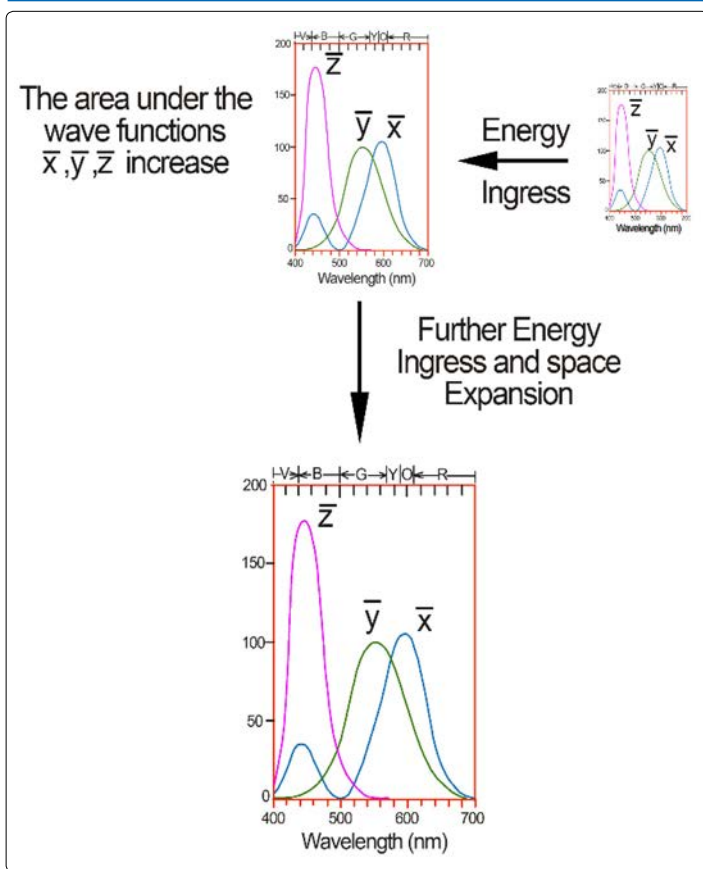


Figure 16.2.1: Color and space expansion

As the $E(\lambda)R(\lambda)$ values are being inserted in the area/volume under the curves \bar{x} , \bar{y} and \bar{z} , the said volumes increase and the color matching functions take enlarged shape as shown in figure 16.2.1.

The value of X of color corresponds to the expanded volume/space of the color matching function \bar{x} , after integration. The value of Y and Z corresponds to the volumes of the color matching functions \bar{y} and \bar{z} respectively, after integration.

So development of color is basically a space expansion phenomenon.

The dimension of color matching function \bar{x} , in Eq.(16.2.1) has been considered to be equal to r , i.e., the dimension of entropy or distance. The $E(\lambda)R(\lambda)$ represents some amount of energy, and this energy has to move to a certain distance to distribute itself under the curves \bar{x} , \bar{y} and \bar{z} (in Fig.16.1.1) and so, the $\bar{x}(\lambda)$, $\bar{y}(\lambda)$ and $\bar{z}(\lambda)$ in Eqs.(16.2.1) to (16.2.3) represents the distance/entropy of travel of the energy. So the dimension of the color matching functions are entropic (r) ones.

So the dimensionality of the Eqn.(16.2.1) turns out to be

$$\int r^3 \cdot r \cdot dr = \int r^4 dr = \frac{r^5}{5} + I \text{ (Constant of integration)} \quad (16.2.4)$$

So the dimensionality of color turns out to be 5, in light waves and in the matter, it will be just inverse 5- dimensional.

The color of an object, what the brain perceives, is related to the ratios of relative volumes of the color matching functions (\bar{x} , \bar{y} and \bar{z}) respectively, after being expanded as shown in Fig. 16.2.1

If, for example after expansion of the color matching functions, the value of X , Y and Z are; (in any arbitrary chosen scale)

- $X = 70$ – RED
- $Y = 20$ – GREEN
- $X = 10$ – BLUE

Then the color will be prominently redder, since the ratio of X , Y and Z is 7:2:1 and X predominates to a large extent.

So in this said case, space enhancement of \bar{x} , is the highest among the three color matching functions.

Color as light wave, in its white form, can also be viewed as a hybrid of the following 5 numbers of gravitons

- Entropy (r)
- Force (r^2)
- 1st degree energy (r^3)
- EM-wave (r^4)
- Space expansion (r^5)

So white color stationary graviton

$$= (r \times r^2 \times r^3 \times r^4 \times r^5)^{1/5} = r^3 \quad (16.2.5)$$

So this white color stationary graviton, when gets a push forward in the form of dimensionality of r^2 , it turns into white color EM wave graviton or space expansion graviton

$$r^3 \times r^2 = r^5 \quad (16.2.6)$$

Black color graviton exists in the mass only and it is a hybrid of the following gravitons:

- Order (r^1)
- Time (r^2)
- 1st degree mass (r^3)
- Anti EM- Wave (r^4)
- Space inversion (r^5)

So the stationary Black color graviton in the form of mass, is = ($r^1 \times r^2 \times r^3 \times r^4 \times r^5$)^{1/5} = r^3 .

Now when this gets a further inversion or pull-back in the form of r^2 it turns to Black color

$$r^3 \times r^2 = r^5$$

So the white and Black colors graviton does exist in equilibrium, with each other and the effect of blending of White Color and Black color, makes the universe Grey.

The dimensionality of color can also be viewed as the hybrid of absorption and scattering of light.

Scattering coefficient of light [95] is the amount of light (volume of light) scattered, per unit mass per unit path length. So the dimension of scattering turns out to be

$$(\text{volume/mass}) \times \left(\frac{1}{\text{path-length}} \right) \quad (16.2.7)$$

The path length being the entropic one, one can obtain the dimension of scattering/scattering co-efficient, from equation (16.2.7) as

$$\text{Scattering co-efficient (s)} = \frac{r^3}{(1/r^3)} \times \left(\frac{1}{r} \right) = r^5 \quad (16.2.8)$$

Now absorption co-efficient of light is by definition “amount of light absorbed per unit mass per unit path-length”. So the dimension would be the same as that for scattering co-efficient in equation (16.2.8). But the absorbed light, when being absorbed, attains the form of mass, and the dimension reaches to inverse 5-dimension.

$$\begin{aligned} \text{Color of light} \\ &= \text{Volume} \times \text{Push Forward} \\ &= \text{energy} \times \text{temperature} \end{aligned} \quad (16.2.9)$$

$$\begin{aligned} \text{Color of object} \\ &= \text{Mass} \times \text{Pull-back} \\ &= \text{Mass} \times \text{time} \end{aligned} \quad (16.2.10)$$

Color of light is an energy and temperature hybrid or space expansion or is an expanding phenomenon.

Color of object is a space inversion phenomena or mass-time hybrid. So when t is very high, color is Black, the darkest, that is what a ‘Black-Body’ or a ‘Black-Hole’ is.

When t decays or the attractive forces are reduced, the object becomes colorful. That is why heating a Black Body, it changes its own color and as well go on emitting different color light-waves. Color can be viewed also as an electronic transition from a lower energy circle to a higher energy circle, as shown below in figure (16.2.2)

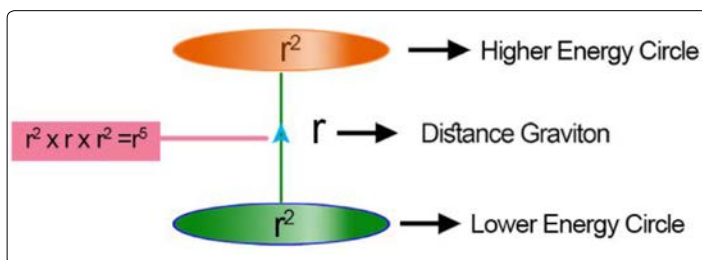


Figure 16.2.2: Evolution of color from transition of electrons from lower to higher energy level

Color can be viewed also as an electronic transition, from a lower energy circle to a higher energy circle belongs to a large energy sphere (as will be explained shortly).

In accordance with Fig.16.2.2.

The dimensionality of color turns out to be $= r^2 \times r \times r^2 = r^5$. (16.2.11)

So this is basically related to the transition of electrons from one orbital of lower energy to an another orbital of higher energy and the color of ‘transition metal salts’ are being explained in the ‘Crystal Field Theory’ in regard to this.

Color can also be viewed as a function of concentration of charges in solution, as the pH scale is. pH is a measure of hydrogen ion concentration in solution. So it is basically “Amount of charge per unit mass of solution”.

$$\text{So the index of color is} = \frac{\text{charge}}{\text{mass}} = \left(\frac{1}{r^3} \right) = r^5. \quad (16.2.12)$$

$$\begin{aligned} \text{Color graviton of light} \\ &= \text{electric current} \times \text{entropy} \\ &= \text{EM wave graviton} \times \text{entropy} \end{aligned} \quad (16.2.13)$$

$$\begin{aligned} \text{Color graviton of object} \\ &= (\text{Time Graviton})^2 \times \text{order graviton} \end{aligned} \quad (16.2.14)$$

16.3 Evolution of Newton’s Color Wheel from QG Theory of Color

The 5-dimensionality of color in light wave can also be viewed as hybrid of entropy, force, energy... as already mentioned. As a matter of fact, from the proper dimensional analysis of the above said hybrids, one can evaluate the electro-magnetic spectrum starting from IR to the formation of VIBGYOR as depicted by Sir Isaac Newton. The hybrid of entropy (πr), force (πr^2), energy (πr^3), EMwave ($\pi^2 r^4$) and acceleration ($\pi^2 r^5$) can be written as (color hybrid function in the light wave) CHFL

$$\begin{aligned} \text{CHFL} &= (\pi r \times \pi r^2 \times \pi r^3 \times \pi^2 r^4 \times \pi^2 r^5)^{1/5} \\ &= (\pi r \times \pi r^2 \times \pi r^2 \times \pi r^2 \times \pi r^2 \times \pi r^2 \times \pi r^2)^{1/5} \\ &= \{r \times (\pi r^2)^7\}^{1/5} \\ &= \{r^{1/5} \times (\pi r^{2/5})^7\} \end{aligned} \quad (16.3.1)$$

$$\begin{aligned} \text{Now if we put, } r^{1/5} &= R, \text{ the above mathematical relation turns into} \\ \text{CHFL} &= \{R \times (\pi R^2)^7\} \end{aligned} \quad (16.3.2)$$

So a CHFL basically is a hybrid of a distance graviton and seven numbers of circles.

The hybrid of order $\left(\frac{1}{\pi r} \right)$, Time $\left(\frac{1}{\pi r^2} \right)$, mass $\left(\frac{1}{\pi r^3} \right)$, anti-magnetic field $\left(\frac{1}{\pi^2 r^4} \right)$ and spaceinversion graviton $\left(\frac{1}{\pi^2 r^5} \right)$ can be written as (color hybrid function in object, CHFO)

$$\begin{aligned}
 \text{CHFO} &= \frac{1}{\pi r} \times \frac{1}{\pi r^2} \times \frac{1}{\pi r^3} \times \frac{1}{\pi^2 r^4} \times \frac{1}{\pi^2 r^5} \\
 &= \left\{ \frac{1}{r} \times \left(\frac{1}{\pi r^2} \right)^7 \right\}^{1/5} \\
 &= \left\{ \frac{1}{r^5} \times \left(\frac{1}{\pi r^2/5} \right)^7 \right\} \quad (16.3.3)
 \end{aligned}$$

If we put, $(1/r^{1/5}) = 1/R'$, then the Eqn.(16.3.3) becomes

$$\text{CHFO} = \frac{1}{R'} \times \left(\frac{1}{\pi R'^2} \right)^7 \quad (16.3.4)$$

So the hybrid of CHFL and CHFO can be written as (Eqns.16.3.2) and (16.3.3)

$$\text{CHFL} \times \text{CHFO} = R \times (\pi R^2)^7 \times \frac{1}{R'} \times \left(\frac{1}{\pi R'^2} \right)^7 \quad (16.3.5)$$

16.4 'Mass-EM Wave Duality', 'Object Color - EM Wave Color Duality'

From equation (16.3.5), one can draw the picture of color of light, and color of object, in equilibrium with each other. This has been done and shown in figure 16.4.1

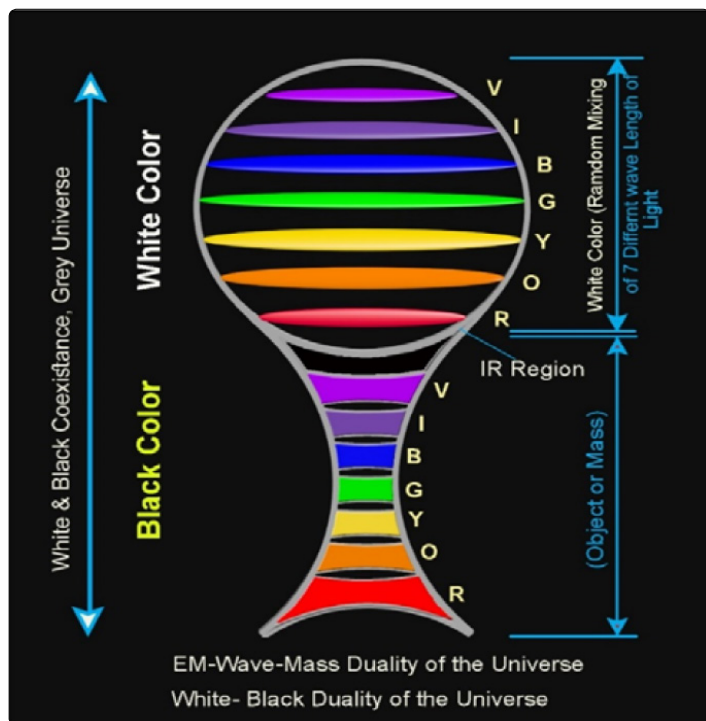


Figure 16.4.1: Diagrammatic Presentation of Grey Universe

In figure 16.4.1, $\left(\frac{1}{\pi R} \right)$ represents the IR region, (πR) represents the border line between visible region of electromagnetic spectrum and the invisible or the high energy electromagnetic wave region.

The seven different colors i.e., violet (V), Indigo (I), Blue (B), Green(G), Yellow (Y), Orange (O) and Red (R) that is the

VIBGYOR, are spread over the space in the form of circles $(\pi R^2)^7$ with increasing magnitude of energy, as shown in figure 16.4.1. The R value in equation (16.3.5) is an average value of R to be derived from the averaging the individual R value of the seven different color circles, as shown in figure 16.4.1 (to be covered in a separate article to be published).

The colors of the object are being trapped as inverse circles, $\left(\frac{1}{\pi R^2} \right)^7$, in the decreasing order of attractive forces from Red to Orange to Green to Blue to Indigo to Violet. In visible light wave region, Red color belongs to the lowest energy and Violet, the highest energy.

On the contrary, in an object Red color is in the most cohesive form of color and Violet is the least cohesive form of color. The random mixing of seven different color circles of the upper part of the figure 16.4.1, leads to the formation of white color light. In the object part the cohesive inverse circles, on an average, do emit only very low energy EM-wave, i.e., the invisible IR waves. So the object looks black or is called a Black Body.

The Black-Body remains in equilibrium, with the white color of light waves and as a result of this, blending of Black and White color; the universe is a grey universe.

The figure 16.4.1 represents also the "EM-WAVE-MASS DUALITY" or typical "BLACKBODY RADIATION" to give rise to different colors of the object and light wave as well.

The color phenomena as a blend of object color and light wave color can be considered, as a whole of 10-dimensionality. So the super-entropic gravitons/singularity gravitons formation $(1/r^{10})$ is also sourced from light wave-matter interaction as well. The origin of the singularity roots from

- i) LIGHT WAVE-OBJECTS INTERACTION
- ii) OVER LAPPING OF INVERSE ACCELERATION FIELDS

Now, the energy distribution of visible EM region (or sunlight) or the spectral power distribution of the various wave-length of light will be looked into.

'Spectral Power Distribution' (SPD), by definition [89], is power per unit area per unit wavelength of an illumination.

$$\begin{aligned}
 \text{SPD} &= \frac{(\text{POWER})}{(\text{AREA})} \times \frac{1}{(\text{WAVE LENGTH})} \\
 &= \frac{\text{ENERGY}}{\text{TIME}} \times \frac{1}{\text{AREA}} \times \frac{1}{\text{WAVE LENGTH}} \quad (16.4.1)
 \end{aligned}$$

Now the dimensionalities of the different variables in equation (16.4.1) above as

$$\begin{aligned}
 \text{Energy} &= r^3 \\
 \text{Time} &= \frac{1}{r^2} \\
 \text{Area} &= r^2 \\
 \text{Wave length} &= \text{distance} = r
 \end{aligned}$$

So the final form of SPD is,

$$= \frac{r^3 \times r^2}{r^2 \times r} = r^2 \quad (16.4.2)$$

So SPD, in fact represents the areas of the seven different circles as shown in figure 16.4.1. If we plot the relative areas of the seven different circles, starting from Red (R) to Violet (V), (taking the area of Red = 1), against the wave length visible light, we get a curve as that shown in figure 16.4.2

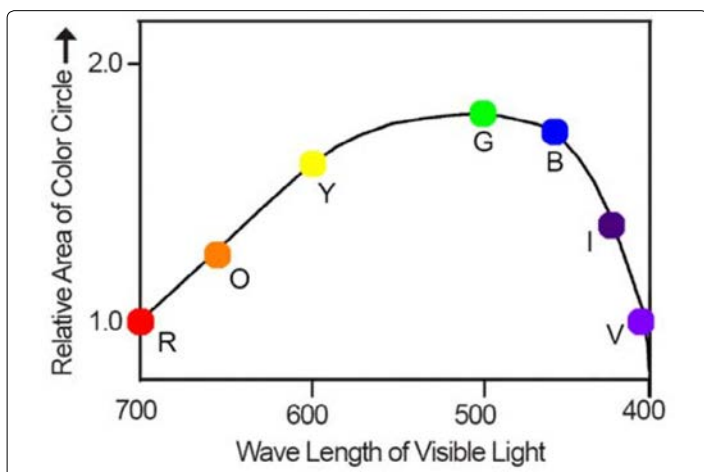


Figure 16.4.2: Representation of SPD against Wave Length of Visible Light

From figure 16.4.2, it is clearly found that the SPD increases from R → O → Y → G and peaks at Green wave length and then diminishes monotonically up to the wave length of Violet light. This SPD wave length pattern of the curve in figure 16.4.2 exactly matches, to the visible spectrum of a solar radiation and which also peaks at Green wave length of visible light. This also explains the Black Body Radiation curves too.

17. CHEMICAL THERMODYNAMICS IN THE LIGHT OF QTHEORY AND CRITERIA OF SPONTANEITY

The total energy of a system is the sum of Kinetic Energy and Potential Energy. The total energy of a system is $4\pi r^3$. Now, the expression for Kinetic energy (KE) is $2\pi r^3$, and this is obtained when one puts the dimensions of mass and velocity in the conventional expression of KE, as shown below, we get:

Kinetic Energy

$$\begin{aligned} &= \frac{1}{2} \times \frac{9}{4\pi r^3} \times \left(\frac{4}{3} \pi r^3\right)^2 \\ &= \frac{1}{2} \times \frac{9}{4\pi r^3} \times \frac{16}{9} \pi^2 r^6 \\ &= 2\pi r^3 \end{aligned} \quad (17.1)$$

So the kinetic energy = (Total energy/2) = $3V/2$ (V = Volume of the

system) and so potential energy (PE) would be (Total Energy – Kinetic Energy) = $3V/2$. Total energy = KE + PE

In Thermodynamics, the total energy (enthalpy, H) is equated to internal energy (U, replacing potential energy) and volume energy (PV, replacing kinetic energy), the internal energy turns out to be $2V$

So the famous equation of thermodynamics can be written as:

$$H = 3V = U + PV = U + V, \text{ (under the condition of equilibrium,)} P=1. \quad (17.2)$$

Also H can be expressed as

$$H = 2V + V \quad (17.3)$$

The above equation can be written in the generalized form as:

$$H = 2PV + PV \quad (17.4)$$

When $P=1$, Eqns.(17.3) and (17.4) become the same.

To assess the capacity of multidirectional entropy or randomness generation of a system, the parameter free Energy (symbolized by G or F) has been brought in Thermodynamics. Suppose a system (closed system, only energy transferring with the surroundings is allowed, no transfer of mass) passes from a state of 1 to a state of 2. Now if this said change of the state, occurs under the condition of equilibrium and under a constant pressure, $P=1$, the energy, the system releases or absorbs, is a measure of the Free energy. If arriving to state 1 from the original state, the system has released, (X) amount of energy, then $(-X)$ is the Free energy of State 1. This is equivalent saying that to arrive at state 1 from the original state, the system has made the X amount of energy, free, and that has passed on to the surroundings.

Now from reaching the state 2 from state 1, if another Y amount of energy is being released by the system, then in state 2, its free energy would be $-(X+Y)$. In fact free energy is the 'DARK ENERGY' of the system in the sense it is being spread all over the surroundings or the universe and it no more remains in equilibrium with the masses.

If during the above said change of state from 1 to 2, if the total entropy generated of the system and surroundings is S and the volume of the system is V, then,

$$\begin{aligned} &\text{(Push forward force} \times \text{entropy of the 'system + surroundings')} \\ &= \text{Total energy involved in the process.} \end{aligned} \quad (17.5)$$

The push forward force is the temperature variable and so the proper representation of the left hand side of the above expression is TS. Now TS is a composite variable and any change of TS should be considered as ΔTS not as $T\Delta S$ or ΔT , as is often done in Chemical Thermodynamics.

$$\text{Total energy involved} = 4\pi r^3 = \frac{4}{3} \pi r^2 \times 3r = \Delta TS. \quad (17.6)$$

A reversible isothermal expansion process is characterized by:

1. HEAT INPUT (from the surroundings) = WORK DONE (by the system)
2. Randomness generation or multi directional entropy generation in the system.

So in an isothermal process, PV remains constant throughout the entire process since whatever the heat enters the system, is fully utilized as so called work. This means the volume energy, PV remains untouched. So in an isothermal process, the energy is provided by the internal energy part (U or 2PV) and the entire 2PV amount of energy can be utilized. However, the surroundings compensates for the same amount of energy, such that the temperature of the system remains constant.

So, the total energy involved in the process = Full utilization of 2PV of internal energy + Energy compensation by the surroundings by an amount, 2PV

$$\text{Hence, } TS = 2PV + 2PV \quad (17.7)$$

Now if in equation (17.7), (-2PV) is being replaced by a parameter, F, the free energy under the isothermal condition, we get an equation,

$$TS = 2PV - F \quad (17.8)$$

The above equation.(17.8) can be rearranged as :

$$TS = U - F$$

$$\text{Or } F = U - TS \quad (17.9)$$

This is the famous equation in Thermodynamics but it is to note that S is the entropy of (System + Surroundings) and never be the entropy of the system only. If the entropy S is considered to be system property only, an equation, as in the form equation (17.9), can never be formed.

A spontaneous process is the one in which the randomization or homogenization of energy occurs over all the directions in both system and surroundings. Another very logical definition of a spontaneous process in nature is “A spontaneous process starts from a non-equilibrium state and ends up with an equilibrium state”.

Suppose one is holding a glass of water in the air and this is a meta-stable state. The moment the person loses his fingers, and releases the glass of water, a non-equilibrium situation is created. This non-equilibrium condition continues until or unless, the glass of water hits the floor, energy is dissipated over all the directions and then only, the equilibrium is attained.

Consider the case of a ‘water holding tank’ with a bottom valve, is placed at a certain height, above the ground level. The tank with water in it is in a state of equilibrium. The moment, the valve is opened, the water starts draining out, a non-equilibrium situation is evolved. However, this continues until and unless the entire water is drained out and it spreads on the ground homogeneously over all the directions. Thirdly, consider the case of a piston holding a gas under a very high pressure in a vessel. Once the piston is released,

a sudden non-equilibrium situation does arise and when the piston moves to a certain equilibrium distance, at which the atmospheric pressure and the inside pressure are equal, there is no further displacement of the Piston.

The spread of TS or the hybrid of push forward and entropy becomes wider in case of a spontaneous process occurring in nature. So from a state of bound or confinement, TS, pass on to a state of higher level or boundless situation. This means the value of ‘TS’ increases as a composite variable.

One form of expressing the 2nd law of thermodynamics is “In case of a spontaneous process, the entropy change of System + surroundings is greater than zero”.

However, this is a wrong statement. It should be amended as “IN A SPONTANEOUS PROCESS THE $\Delta(TS) > 0$, or the change in the magnitude of temperature-entropy hybrid > 0 .”

From equation (17.9), it can be concluded that for a spontaneous process since $\Delta TS > 0$ and U remaining constant, since it is an isothermal process, ΔF has to be < 0 . So the true criteria of spontaneity is lying in the following expression:

$$(\Delta F)_T < 0 \quad (17.10)$$

It is told that $(\Delta F)_{T,v} < 0$, and this does not carry any sense truly, if the temperature and volume, both are remaining constant.

For a process taking place under constant pressure, the energy enters both the internal energy compartment and the pressure-volume compartment. As a result both the temperature and the PV part changes. For an expansion process under constant pressure, temperature increases (push-forward increases) and as well, the volume energy, PV. Now, energy cannot be taken out from the internal energy compartment (though, it gets enriched more and more during an isobaric or constant pressure expansion), since then, the temperature will drop. So for the said process, at any instant, the total involvement of energy (system + surroundings), is the sum of internal energy of the system, volume energy (PV) of the system and the compensated volume energy to the system by the surroundings, which is another, PV. So

$$TS = U + PV + PV = H + PV \quad (17.11)$$

Now another free energy parameter is brought, that is, free energy G which is equal to (-PV). The equation (17.11) can be rearranged to

$$G = H - TS \quad (17.12)$$

Now the criteria of spontaneity of $\Delta TS > 0$ remaining the same, the criteria of spontaneity would be in regard to G under constant pressure condition.

$$\Delta G_p < 0 \text{ and when } \Delta H = 0$$

Now the question is, in which condition, the $\Delta H = 0$?

If a process takes place under isothermal condition, the ΔH remains constant. For an isothermal mixing process, although ΔH remains to be zero, but the pressure changes during the process. So for such processes, determining the spontaneity of the process, by G_p function is not possible at all.

For such processes the free energy function F_T to be used and that too under isothermal conditions.

G_p function, for determining the spontaneity/non-spontaneity of a change can be utilized for mixing of two liquids or gases or a chemical reaction occurring at constant temperature and pressure.

Now as per equation (17.12), the ΔH of the process has to be zero, but such cases are ideal only not real.

If the above said mixing/chemical reaction is exothermic, the change TS becomes more and more since the evolved heat increases both the push forward (temperature) and entropy and due to its thrust, ΔTS becomes more positive. So for the exothermic processes under constant pressure, if ΔG_p is <0 , the process has to be spontaneous.

For endothermic processes, the entropy and temperature both decreases, so, there is a chance that its effect may make the value of $TS <0$. In such situation, the change will become non-spontaneous and ΔG_p will attain a positive value.

If the heat of the mixing/chemical reaction is very low positive such that its effect on TS still leaves TS positive, the ΔG_p remains negative and the change becomes a spontaneous one. So the generalized condition of criteria of spontaneity in terms of G_p is:

$$\Delta G_p < 0 \text{ and } \Delta H < \Delta TS \text{ (for the changes occurring at a constant temperature)}$$

The true criteria of spontaneity lies in time-temperature and pressure relationship and is fully independent of whether the process is isothermal, adiabatic, isobaric, exothermic, endothermic,... etc. or not, and that we will explore now.

When a chemical reaction, $(A+B) = (C+D)$ is taking place in a vessel, spontaneously under the condition of constant temperature and pressure (a closed system), one will conclude that ΔG is negative for the forward process and that is the reason the forward reaction is occurring spontaneously. But the reverse reaction $(C+D) = (A+B)$ is also occurring in the vessel, spontaneously for this reverse reaction.

Since ΔG is negative for $(A+B)$ to $(C+D)$, then the reverse process, $(C + D)$ to $(A+B)$ has to be a positive one. If ΔG is positive, according to the Thermodynamic laws, it cannot be a spontaneous process..., then?

At the start of the forward reaction, the Push Forward force is

operating and growing too. After this Push Forward force reaches an optimum level, the pullback forces start operating, and this also starts growing and a stage of equilibrium is reached as shown below:

$$\begin{aligned} &(\text{PUSH FORWARD FORCE GRAVITON} \times \text{PULL BACK} \\ &\text{FORCE GRAVITON}) = 1 \\ &= \text{THE EQUILIBRIUM PRESSURE} = P \end{aligned} \quad (17.13)$$

The Push forward force graviton is the 'Temperature, 'T' and the pullback graviton is the 'Time, 't' and one can say, the true criteria of spontaneity which leads to equilibrium is

$$T t = 1 \quad (17.14)$$

At the equilibrium point of any physical or chemical process, the forward order and the backward order become the same. This will be illustrated in this article.

So it is better to calculate the Tt profile of any physical/chemical process than calculating ΔG .

For non-spontaneous processes, Tt will be either >1 or <1 .

18. TRIGONOMETRIC FUNCTIONS AND GRAVITONS

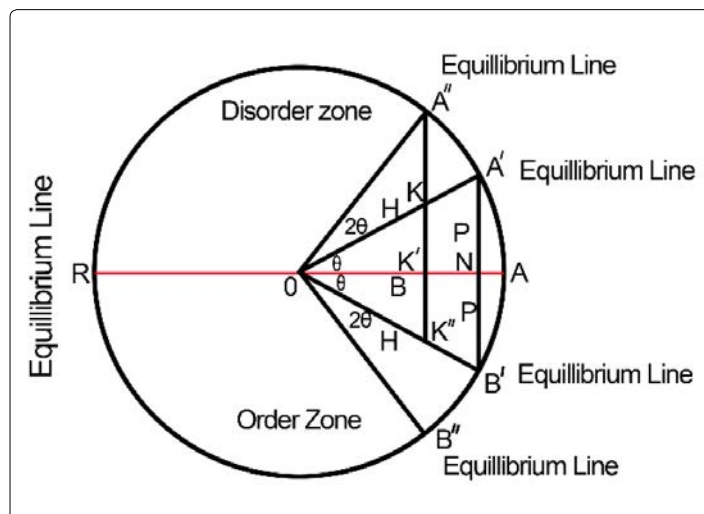


Figure 18.1: Representation of Sin θ and Cos θ Function as the Index of longitudinal and transverse 'Randomness'

The trigonometric functions are the linear representation of curvatures. If one follows figure 18.1 above, it represent a circle. The center of the circle is 'O'. The straight line OA is the equilibrium line and which is the radius of the circle PQRS. The equilibrium line rotates in the plane of the circle with center O and as a result the position of the equilibrium changes.

The equilibrium line, as if, splits into two number of equilibrium lines (and in figure 18.1) and OQ rotates anti clock-wise clock-wise. The rotations of the equilibrium lines give rise to the formation of

different right-angle triangles as shown in figure 18.1.

The projection of the points like A', A'' and B', B'' represents the bases (B) of the formed right-angled triangles. On the other hand, the straight lines A''B, A''N are the perpendiculars (P) of triangles. The equilibrium lines are the hypotenuses (H) of the triangle. The trigonometric functions like sinθ, cosθ, tanθ, secθ,... are the representations of curvatures of the circle by the linear dimensional representation in the form of perpendicular (P), Base (B) and hypotenuse (H).

In the case of trigonometric function, $\sin\theta \left(= \frac{P}{H} \right)$ as θ increases the length of the perpendicular (NA', NA'') go on increasing. So sinθ in fact is an index or indicator of longitudinal expansion. The trigonometric function cosθ, on the other hand, is an index or indicator of lateral or transverse contraction. Since, as θ increases the length of bases (ON, OX..) decrease. In two dimensions sinθ represents longitudinal growth to equilibrium or unit is cosθ represents the lateral contraction of the same area. So tanθ turns out to be an index or indicator of area distribution pattern of longitudinal area over the lateral/transverse area. This concept when is extended to 3-dimensions sinθ takes the form of kinetic function energy (longitudinal energy/volume) function and tanθ the energy distribution pattern of longitudinal kinetic energy over the lateral kinetic energy. This subject will be elaborated in the latter part of this article.

Trigonometric functions and Gravitons and mass and energy distribution pattern

From the subsequent discussions, we know that

$$\sin\theta = \frac{P}{H} \text{ or } P = H \sin\theta$$

This is the representation of $\sin\theta$ in 2-dimensions. However, θ increases (figure 18.1 is referred) the value of P or the longitudinal expansion increases. The triangles are formed as shown in Fig.8.1 and the area of the triangles would be

$$\begin{aligned} &= \frac{1}{2} (\text{Base}) \times \text{height} = \frac{1}{2} B \times P \\ &= \frac{1}{2} \times \text{multiple of } r \times r \sin\theta \\ &= \frac{n}{2} \times r^2 \sin\theta = \frac{n}{2} \times r^2 \sin\theta \quad [n = \text{multiple}] \end{aligned} \quad (18.1)$$

The area of the curved sections under the triangles would be obtained by multiplying equation (18.1) above by the factor π.

$$\text{So the area of the curved portions} = \pi \times \frac{n}{2} \times r^2 \sin\theta \quad (18.2)$$

If this effect it is extended in 3-dimension then one assess on to

volume or energy. In this case the following figure 18.2 is referred

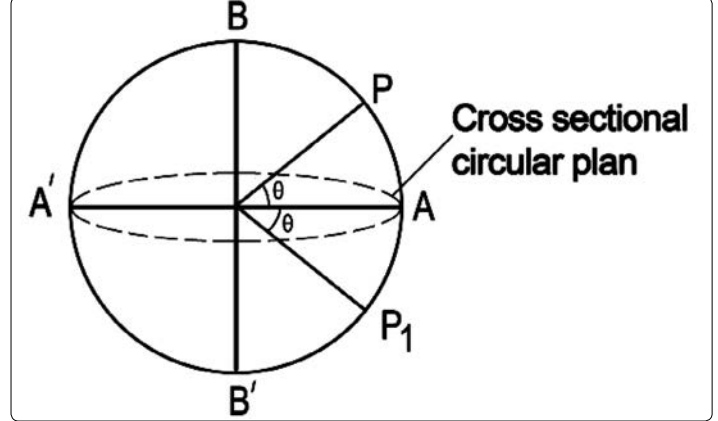


Figure 18.2: Energy and Mass co-existence in a sphere

So a circle is formed along the cross-section and a half circle is formed longitudinally. The hybrid effect of the said two factors leads to the formation of volume or energy variable. So another multiple of r is being multiplied with the r.h.s. of equation (18.2) and it takes the shape

$$\text{Volume or energy} = \pi \times \frac{n}{2} \times r^2 \sin\theta \times n'r$$

Where n' is another multiple along the cross section plane as shown in figure 18.2.

$$\text{So volume or energy} = \frac{\pi n \times n'}{2} \times r^3 \sin\theta \quad (18.3)$$

In fact equation (18.2) is a force growth and equation (18.3) is a growth of volume or energy graviton.

If the rotation of the equilibrium line OA is continued up to θ = 180° (ends up at point A'), a half energy sphere is obtained. So the energy graviton in equation (18.3) reaches a maximum and then again diminishes to the level of region as in point A.

The energy distribution pattern is obtained by dividing $\sin\theta$ by $\cos\theta$ (i.e. tanθ)

$$\text{Now } \cos\theta = \frac{B}{H} \quad B = \cos\theta$$

So lateral force and energy would take the shape.

$$\text{Lateral force graviton} = \frac{m \times \pi}{2} r^2 \cos\theta, \quad m - \text{is a multiple} \quad (18.4)$$

$$\text{Lateral energy Graviton} = \frac{m \times m' \times \pi}{2} r^3 \cos\theta, \quad m' - \text{is a multiple} \quad (18.5)$$

So the ratio of longitudinal energy (LUE) to the lateral energy (LAE) is the energy distribution

pattern (to be obtained by dividing equation (18.3) by equation (18.5))

$$= \frac{LOE}{LAE} = \frac{nn'}{mm'}$$

The geometrical shape of the LOE and LAE are shown in figure 18.3 below

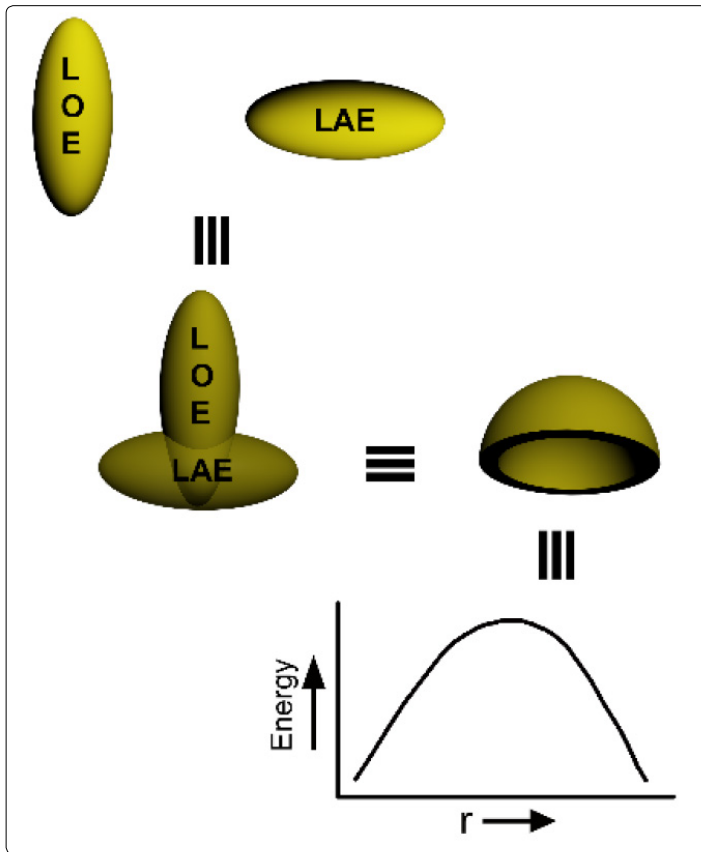


Figure 18.3: Energy Distribution against 'r' Originated from LOE to LAE ratio

When one divides LOE by LAE as shown in figure 18.3, the typical energy distribution pattern is obtained.

So the typical distribution curve is to start with a lower value reaches a maximum and then drops down to the original level of energy. So this way one can explain the typical Black-Body radiation curves too.

Once the lower part of the sphere is considered as shown in figure 18.3, the expressions of the pull-back gravitons can be obtained. These are shown below.

Longitudinal time graviton

$$= \frac{1}{\pi} \times \frac{n}{2} \times \frac{1}{r^2} \operatorname{cosec}\theta \quad (18.6)$$

Lateral/transverse time graviton

$$= \frac{1}{\pi} \times \frac{m}{n} \times \frac{1}{r^2} \operatorname{sec}\theta \quad (18.7)$$

Longitudinal mass graviton

$$= \frac{nm}{2\pi} \frac{1}{r^3} \operatorname{cosec}\theta \quad (18.8)$$

Lateral/transverse mass graviton

$$= \frac{mm'}{2\pi} \frac{1}{r^3} \operatorname{sec}\theta \quad (18.9)$$

So mass distribution pattern would be obtained by dividing Eqns. (18.8) by (18.9). The mass distribution pattern is shown in figure 18.4.

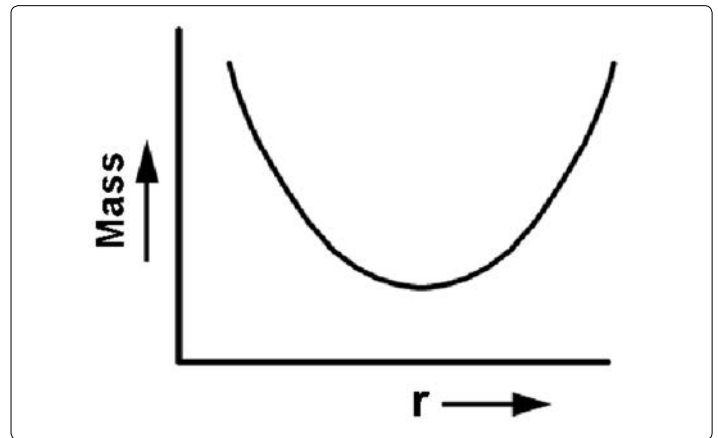


Figure 18.4: Mass Distribution Pattern

The trigonometric functions are the indexes or the indicators of the different gravitons as given below

$\operatorname{Sin}\theta$ - Longitudinal force graviton, longitudinal energy graviton

$\operatorname{Cos}\theta$ - Lateral force graviton, Lateral energy graviton

$\operatorname{Tan}\theta$ - Energy Distribution pattern

$\operatorname{Cosec}\theta$ - Longitudinal time graviton, Longitudinal mass graviton

$\operatorname{Sec}\theta$ - Lateral time graviton, Lateral mass graviton

$\operatorname{Cot}\theta$ - Mass Distribution pattern.

The total mass-energy distribution pattern is shown below in Figure 18.5 below

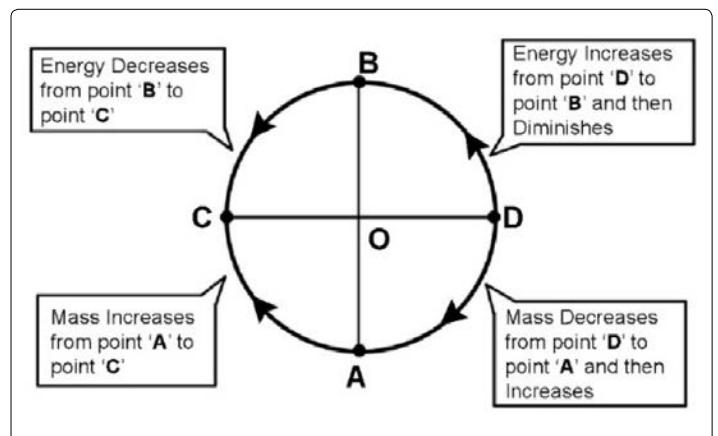


Figure 18.5: Mass-Energy Equivalence Circle

19. UNIFIED QUANTUM GRAVITY THEORY OF THE UNIVERSE

19.1 Dimensionality of Electric Charge and the Effective Dimensions of an Atom

When one rubs two different surfaces against each other, charges are being generated. Basically, on rubbing two numbers of surfaces against each other, is a mass delocalization phenomenon. This generates energies too. So delocalization of mass (RDM) is a hybrid of charge and energy. Energy is 3-dimensional and so

$$\text{RDM} = r^5 = \text{energy} \times \text{charge}$$

$$\text{So charge} = \frac{r^5}{r^3} = r^2$$

We can write an energy graviton in the form

$$\text{Energy} = r^3 = r^2 \times r = \text{Force or Charge} \times \text{entropy}$$

Since entropy represents a distance or displacement, so energy is displacement of Charge. When an energy graviton is acted upon by an anti-entropy graviton, it swallows the entropy part of it, and the energy graviton is being transferred to a 2-dimensional charge or force graviton

19.2. Dimension of Atom and Evolution of Time Graviton

An atom has two parts, the nucleus and the extra nuclear electrons. The electrons are moving in different orbits.

The moving electrons are in fact generating an electric current. An electric current is already shown to be 4-dimensional (r^4). Now the nucleus has a mass (of the protons and the neutrons) and which is inverse 3-dimensional (r^{-3}). The proton has a positive charge and which is 2-dimensional (r^2).

The distance between the nucleus and the several electronic energy levels, has a dimensionality of r^1 . Nucleus, being positively charged entity, attracts the negatively charged electrons and as a result the distance between the nucleus and the electron is not of a entropy dimension, but is just the reverse, so this is a anti entropy graviton or distance collapsing graviton. So the nucleus has a dimensionality of

$$\frac{1}{r^3} \times r^2 \times \frac{1}{r} = \frac{1}{r^2} \quad (19.2.1)$$

Now since an atom is a hybrid of nucleus and electrons, the overall dimensionality of an atom is

$$r^4 \text{ (of electronic orbital)} \times \frac{1}{r^2} \quad (19.2.2)$$

So, an atom, overall lies in the state of r^2 or 'push forward'. (19.2.3)

Expressing the dimensionality of an atom in the form as in equation (19.2.2) is equivalent expressing it as:

$$\text{Hybrid of, } r^3 \times r \times \frac{1}{r^2} = \text{Energy} \times \text{Entropy} \times \text{Time} \quad (19.2.4)$$

An atom is picturized in figure 19.2.1 below

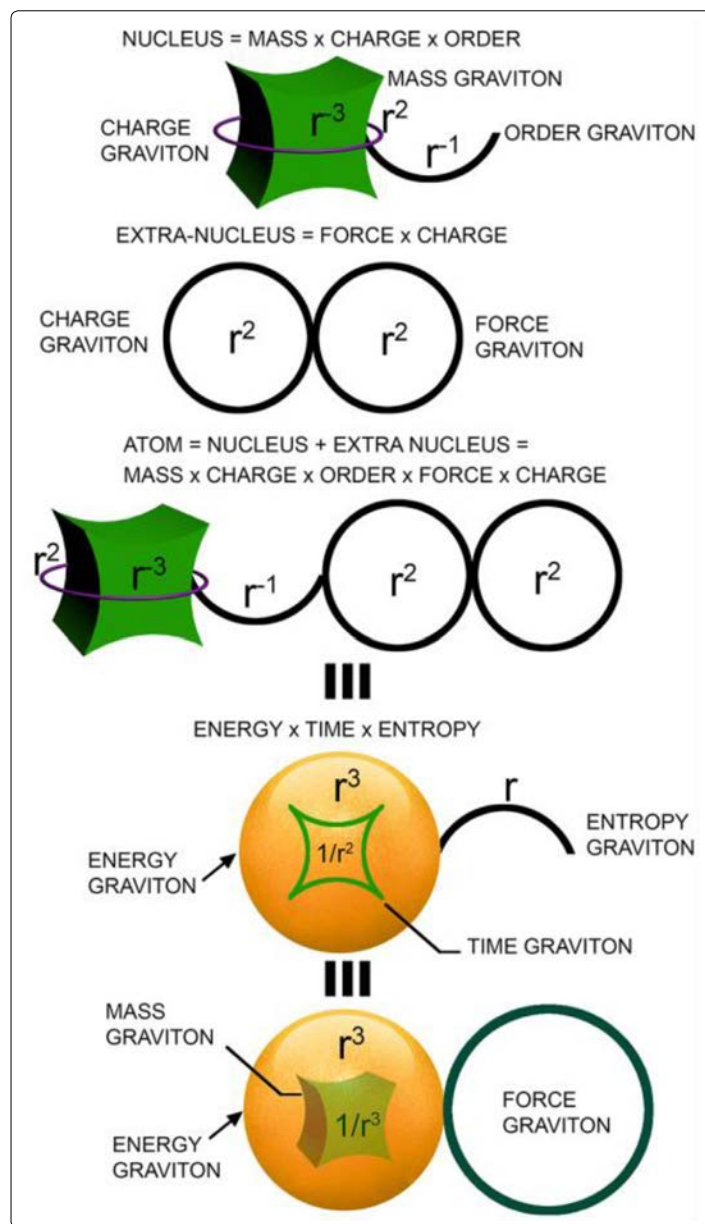


Figure 19.2.1: Picturization of an atom

From the said figure, it is found that a time graviton (resting at the center of the atom) and intermolecular distance (in the form emerged out entropy graviton) are associated with an atom always. The time graviton is evolved from the nucleus and the intermolecular distance is evolved from extra-nuclear electrons.

19.3 Orders of the Chemical Reactions and the Gravitons

We are very much familiar with a term 'Order of a Chemical reaction'. The definition of the order of a chemical reaction is "The sum of the indices of the concentrations of the different reactants in the expression of the rate of the reaction or rate expression".

The rate of a chemical reaction is written as $(-dC/dt)$, where C is the concentration of the reactants at a time, t . So the rate expression is

$$(-dC/dt) = k \times C^n \quad (19.3.1)$$

Where n is the order of the reaction and k is the rate constant of the reaction. The equation (19.3.1) can be re-written as :

$$k = (-dC/dt) = k \times (1/C^n) \quad (19.3.2)$$

or, $k = \text{Rate of reaction} \times (1/C^n) \quad (19.3.3)$

Rate of a reaction is basically being the numbers of moles of reactants being consumed per mole of the reaction mixture per unit time, t the time in all the above said equations (19.3.2) and (19.3.3) are all the conventional scale of time in the form of distance. The concentrations (C) are in the form of (moles/liter), so $(1/C)$ is (liters/moles), so

$$k = (\text{moles/liters}) \times (1/t) \times (\text{liters/moles})^n$$

So, $k = \text{litres}^{n-1} \text{ moles}^{1-n} \text{ t}^{-1} \quad (19.3.4)$

So the dimensionality of the rate constant, k is (barring t , which is common for any rate constant)

$$k = (r^3)^{n-1} = r^{3n-3} \quad (19.3.5)$$

Now the physical significance of the rate constant is, higher it is in the magnitude, the faster would be the reaction rate. Again the rate constant of a Chemical reaction is linked to the so called 'activation energy', E , of the reaction by the famous Arrhenius equation

$$k = A \times e^{-E/RT} \quad (19.3.6)$$

Where, R = Universal gas constant

A = Frequency Factor

T = Temperature at which the reaction is taking place

So from equation (19.3.6), it is very much obvious that higher the activation energy, lower would be the value of the rate constant. Higher the rate constant is, higher is the order of a chemical reaction, as can be understood from k -order relationship as shown in equation (19.3.5).

We land up to a situation that, higher order reactions are characterized by lower activation energy values and those are very much random by nature. On the contrary, lower are the orders of a chemical reaction, activation energies are higher or those are ordered nature reactions.

So, a zero order reaction will have a high activation energy and in the reaction vessel, the molecules would remain in an ordered state. As one goes onwards from 0 order to 1st order to 2nd order to 3rd order etc, more and more random situations are being evolved.

If one does have a close look of the form of equation (19.3.4), irrespective of the order of a chemical reaction, the term t^{-1} is always being present. This, t^{-1} signifies that the molecules have to come out, the cohesive attraction cage first, and then take part in the chemical reactions. In other words, until and unless attractive forces are overcome, by the molecules, there is no possibility of a chemical reaction to take place.

Once the attractive forces are overcome, the reaction conditions are controlled by imposing the reaction conditions like stirring (force graviton), temperature (push forward force/pull back force graviton), concentration (entropy graviton)... etc.

The orders of a chemical reaction are the effects of 'mass graviton-order graviton' or 'energy graviton- entropy graviton' interactions.

The concept of orders of chemical reactions, if, be understood properly, should not be confined to chemical reactions only. These would be valid for any sort of energy-mass interactions of the universe as a whole, and it indeed covers the nuclear reactions too.

The dimensionality of a zero order reaction, as we get from equation (19.3.5) by putting $n=0$, is r^{-3} , and as a result, a zero order reaction is in a state of very cohesive form, i.e., in the form of 1st degree mass. So increasing either the push forward force (temperature increase) or the entropy (increasing the concentration of the reactants), do not affect the rate of such type of reactions virtually.

When one puts, $n=1$, in equation (19.3.5), the order of the reaction becomes r^0 , a first order reaction. In a 1st order reaction, a mass graviton and energy graviton co-exists. The mass gravitons are being eaten-up by the energy gravitons in the cases of a first order reaction, like radioactive decay, and as a result, the rate of the reaction rapidly falls off with time.

In case of a reaction of (-1) order, the dimension of k is r^6 and hence a (-1) order chemical reactions are the game of 2nd degree mass gravitons.

We will now show how the entropy graviton plays the vital role to generate the different orders of the reactions. Once the data compiled in Tables 19.3.1 and 19.3.2 are being viewed, it is found that when the order of the reaction is 1.33, the dimensionality of k is r and that corresponds to the generation of a real entropy graviton. The pattern obtained is shown in the following tables.

Table 19.3.1: ‘Order of the universe’ in relation to energy graviton, entropy graviton and mass graviton-I.

Sl. No.	Order of the reaction	Dimensionality of k, rate constant	Dimensionality of k expressed in regard to Energy Graviton	Dimensionality of k expressed in regard to Entropy Graviton	Dimensionality of k expressed in regard to Mass Graviton
1.	0	r^{-3}	$(E_{gr})^{-1}$	$(S_{gr})^{-3}$	$(m_{gr})^1$
2.	0.5	$r^{-1.5}$	$(E_{gr})^{-0.5}$	$(S_{gr})^{3/2}$	$(m_{gr})^0.5$
3.	0.6	$r^{-1.2}$	$(E_{gr})^{-2/5}$	$(S_{gr})^{6/5}$	$(m_{gr})^{2/5}$
4.	0.7	$r^{-0.9}$	$(E_{gr})^{-0.3}$	$(S_{gr})^{-0.9}$	$(m_{gr})^{0.3}$
5.	0.8	$r^{-0.6}$	$(E_{gr})^{-0.2}$	$(S_{gr})^{-0.6}$	$(m_{gr})^{0.2}$
6.	0.9	$r^{-0.3}$	$(E_{gr})^{-0.1}$	$(S_{gr})^{-0.3}$	$(m_{gr})^{0.1}$
7.	1	r^0	$(E_{gr})^0$	$(S_{gr})^0$	$(m_{gr})^0$
8.	1.1	r^3	$(E_{gr})^{0.1}$	$(S_{gr})^{0.3}$	$(m_{gr})^{-0.1}$
9.	1.2	r^6	$(E_{gr})^{0.2}$	$(S_{gr})^{0.6}$	$(m_{gr})^{-0.2}$
10.	1.3	$r^{0.9}$	$(E_{gr})^{0.3}$	$(S_{gr})^{0.9}$	$(m_{gr})^{-0.3}$
11.	1.33	r^1	$(E_{gr})^{1/3}$	$(S_{gr})^1$	$(m_{gr})^{-1/3}$
12.	1.4	$r^{1.2}$	$(E_{gr})^{1/3}$	$(S_{gr})^{1.2}$	$(m_{gr})^{-1/3}$
13.	1.66	r^2	$(E_{gr})^{2/3}$	$(S_{gr})^2$	$(m_{gr})^{-2/3}$
14.	2	r^3	$(E_{gr})^1$	$(S_{gr})^3$	$(m_{gr})^{-1}$
15.	2.33	r^4	$(E_{gr})^{4/3}$	$(S_{gr})^4$	$(m_{gr})^{-4/3}$
16.	2.66	r^5	$(E_{gr})^{5/3}$	$(S_{gr})^5$	$(m_{gr})^{-5/3}$
17.	3	r^6	$(E_{gr})^2$	$(S_{gr})^6$	$(m_{gr})^{-2}$
18.	3.33	r^7	$(E_{gr})^{7/3}$	$(S_{gr})^7$	$(m_{gr})^{-7/3}$
19.	3.66	r^8	$(E_{gr})^{8/3}$	$(S_{gr})^8$	$(m_{gr})^{-8/3}$
20.	4.00	r^9	$(E_{gr})^3$	$(S_{gr})^9$	$(m_{gr})^{-3}$
21.	4.33	r^{10}	$(E_{gr})^{10/3}$	$(S_{gr})^{10}$	$(m_{gr})^{-10/3}$
22.	4.66	r^{11}	$(E_{gr})^{11/3}$	$(S_{gr})^{11}$	$(m_{gr})^{-11/3}$
23.	5	r^{12}	$(E_{gr})^4$	$(S_{gr})^{12}$	$(m_{gr})^{-4}$

Table 19.3.2: ‘Order of the universe’ in relation to energy graviton, entropy graviton and mass graviton-II.

Sl. No.	Order of the reaction	Dimensionality of k, rate constant	Dimensionality of k expressed in regard to Energy Graviton	Dimensionality of k expressed in regard to Entropy Graviton	Dimensionality of k expressed in regard to Mass Graviton
1.	-1	r^{-6}	$(E_{gr})^{-2}$	$(S_{gr})^{-6}$	$(m_{gr})^2$
2.	1.33	r^{-7}	$(E_{gr})^{-7/3}$	$(S_{gr})^{-7}$	$(m_{gr})^{7/3}$
3.	-1.66	r^{-8}	$(E_{gr})^{-8/3}$	$(S_{gr})^{-8}$	$(m_{gr})^{8/3}$
4.	-2	r^{-9}	$(E_{gr})^{-3}$	$(S_{gr})^{-9}$	$(m_{gr})^3$
5.	-2.33	r^{-10}	$(E_{gr})^{-10/3}$	$(S_{gr})^{-10}$	$(m_{gr})^{10/3}$
6.	-2.66	r^{-11}	$(E_{gr})^{-11/3}$	$(S_{gr})^{-11}$	$(m_{gr})^{11/3}$
7.	-3	r^{-12}	$(E_{gr})^{-4}$	$(S_{gr})^{-12}$	$(m_{gr})^4$
8.	-3.33	r^{-13}	$(E_{gr})^{-13/3}$	$(S_{gr})^{-13}$	$(m_{gr})^{13/3}$
9.	-3.66	r^{-14}	$(E_{gr})^{-14/3}$	$(S_{gr})^{-14}$	$(m_{gr})^{14/3}$
10.	-4	r^{-15}	$(E_{gr})^{-5}$	$(S_{gr})^{-15}$	$(m_{gr})^5$
11.	-4.33	r^{-16}	$(E_{gr})^{-16/3}$	$(S_{gr})^{-16}$	$(m_{gr})^{16/3}$
12.	-4.66	r^{-17}	$(E_{gr})^{-17/3}$	$(S_{gr})^{-17}$	$(m_{gr})^{17/3}$
13.	-5	r^{-18}	$(E_{gr})^{-6}$	$(S_{gr})^{-18}$	$(m_{gr})^6$

19.4 Concept of ‘ π -Graviton’ and ‘Anti π -Graviton’

As shown in Figure 19.4.1, when a force graviton acts on an order graviton, an elongation takes place of the order graviton.

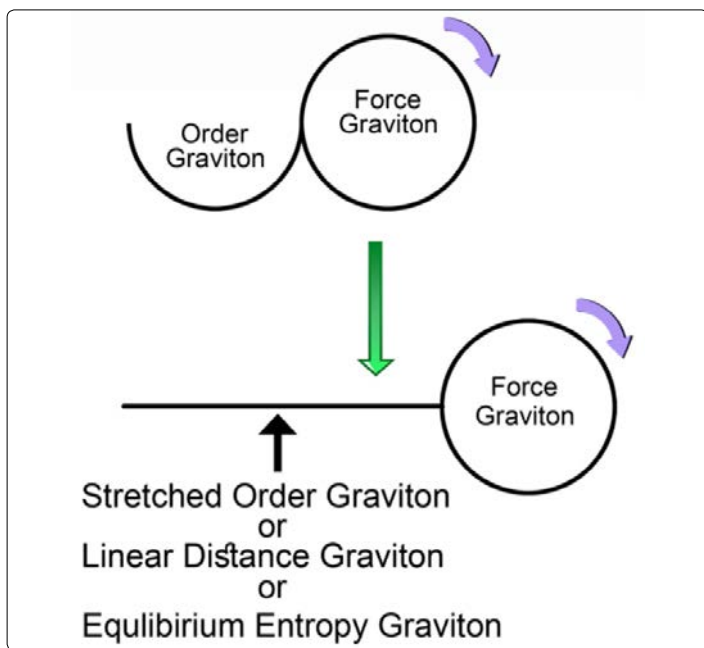


Figure 19.4.1: Formation of a ‘Stretched Order Graviton’ or a ‘Linear Distance Graviton’ or an ‘Equilibrium Entropy Graviton’ upon the action of a Force Graviton or an Order Graviton

The order graviton is being elongated or straightened by the action of the rotating force graviton and this is an exponential elongation or e-elongation. This leads to an increase in the inter graviton spacing’s. So from a state of order or positional certainty, the order graviton passes on to a state of higher positional uncertainty. This state, in the language of Thermodynamics, is the state of equilibrium of the gravitons. The universal constant factor, π , has ones been explained in this article, Sec.2.1. Now from this, we get the real core definition of the exponential factor, e:

$$e = \frac{\text{(Average inter graviton distance at the state of higher positional uncertain state or equilibrium state)}}{\text{(Average inter graviton distance at the positional certain state or ordered state)}} \quad (19.4.1)$$

The nature of the e function, as explained at the beginning of the article leaves the entropy graviton in a state, where its length remains in an infinitesimally small increasing mode and in a nonconverging mode.

The action of the Force Graviton on the order graviton is not being completed here. It does continue acting on the order graviton and makes it rotating to form a half-circle as shown in Figure 19.4.2

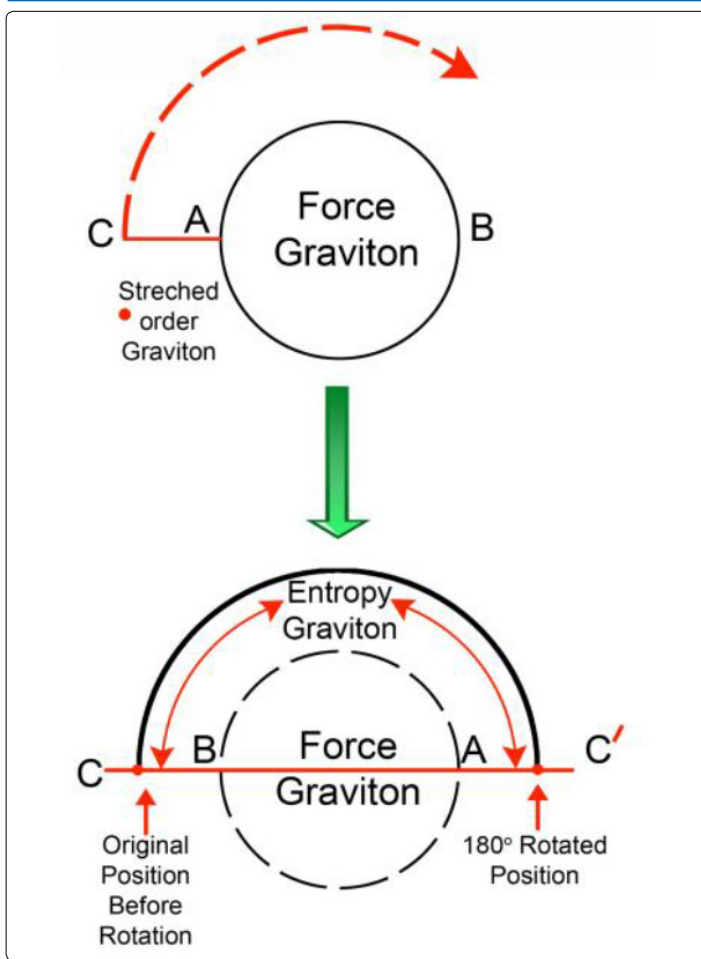


Figure 19.4.2: Formation of an Entropy Graviton from a “Stretched Order Gravitation” and a ‘Force Graviton’. The Force Gravitation as a whole Rotates by 360° (Point A moves to point B, a 180° Rotation Point B moves to point A, a 180° Rotation) and as a result the stretched order Graviton Rotates by 180°. Entropy Graviton is a half Circle

This way, a push forward entropy graviton is formed. Once it creates a half-circle, the gravitons which were residing on a straight line, now are spread over the entire two dimensions and the average inter graviton spaces do increase further. So the positional uncertainties of the gravitons do increase further. So the positional uncertainties of the gravitons being increased, they pass on to state of disordered or random state. The following ratio, is indeed the, what the universal constant π is,

$$\pi = \frac{\text{(Average inter graviton distance at the state of high positional uncertainty or random state)}}{\text{(Average inter graviton distance at the state of less positional uncertainty or equilibrium state)}} \quad (19.4.2)$$

The effect of e-elongation does persist in the value of π and as a result, it offers a nonconverging value.

The most interesting phenomena is the occurrence of very close interaction of an entropy graviton with an order graviton as shown in figure 19.4.3 below.

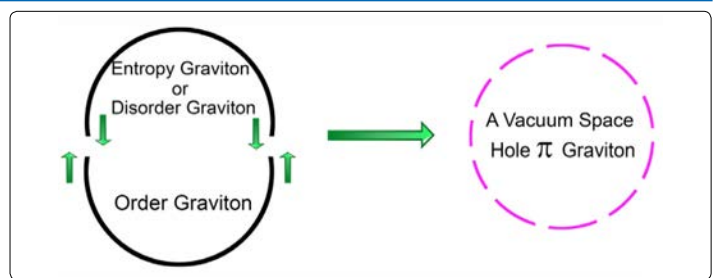


Figure 19.4.3: Face to Face interaction of an order Graviton and a Disorder Graviton leads to the Formation of a “Space Hole” or “Vacuum”. This is called an Empty “Space Hole π - graviton”

The inverse entropy graviton or the order graviton swallows the entropy graviton, then, what is left is a vacuum space as shown in figure 19.4.3 above. This vacuum space does not contain any mass or energy. These are called empty space rotating π -gravitons. These may also be considered as rotating space whole π -gravitons.

In this π origin evaluation exercise, we have dealt with order graviton, force graviton and entropy gravitons. If the same exercise is extended to force graviton, time graviton and energy graviton, this will lead to the formation of 3-dimensional empty spheres and these are also π -gravitons. So π -gravitons are either 2-dimensional or the 3 dimensional.

The evolution of π -graviton in 2 or 3-dimensional space, has been schematically shown below:

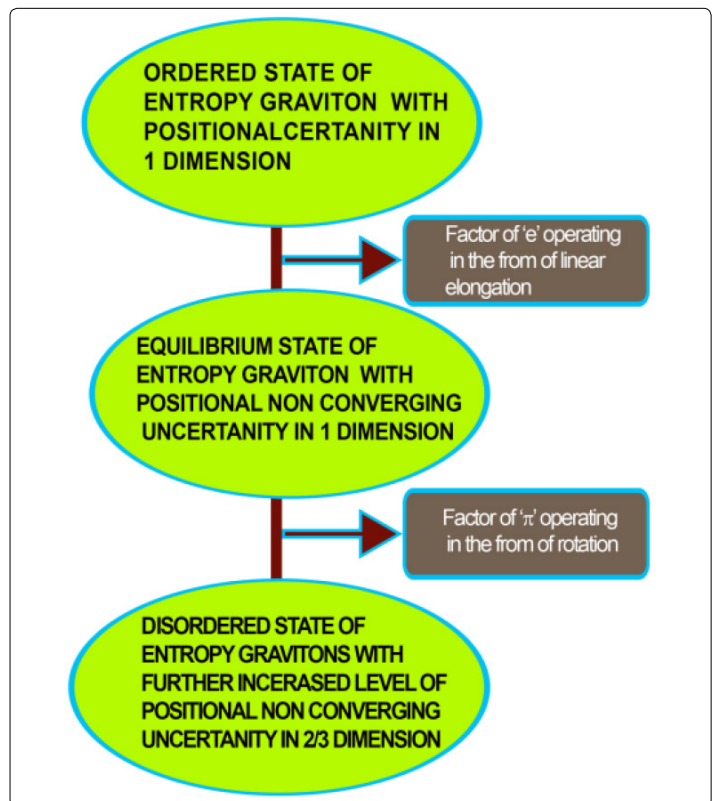


Figure 19.4.3a: Schematic representation of evolution of ‘ π graviton’ in 2/3 dimension

From empty space π -gravitons, how the anti π -gravitons are generated is shown in Figure 19.4.4

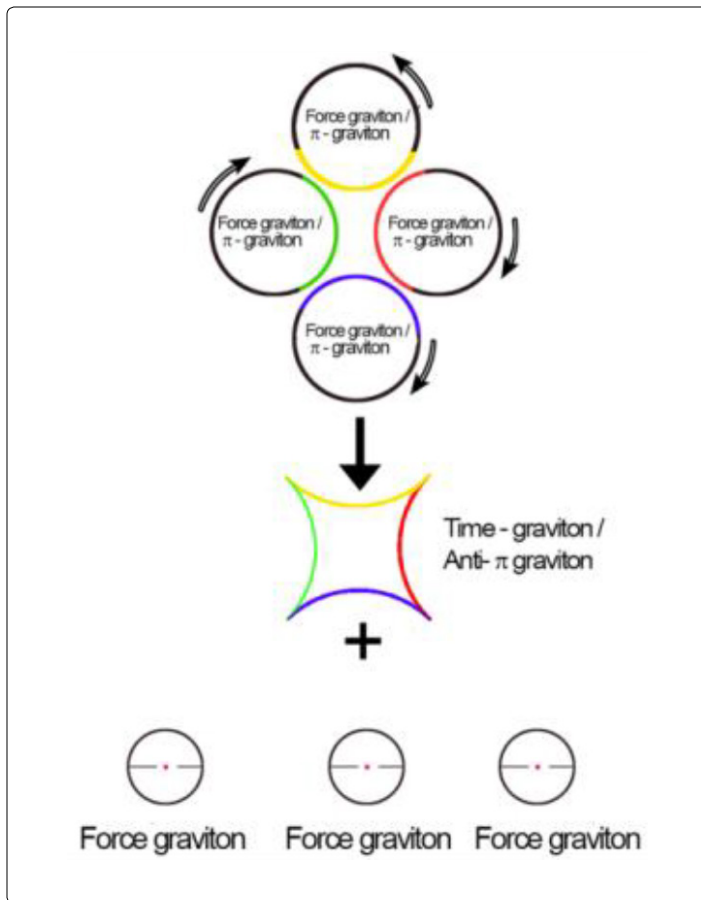


Figure 19.4.4: Formation of Time-graviton from the closely interacting of 4 nos. of ‘Force gravitons’. The direction of rotation of the force gravitons are shown by arrow. On the figure. The similar fashion an anti π graviton is formed from 4 nos. of rotating π gravitons

From the figure 19.4.4 one can understand that a close interaction of 4 nos. of π -gravitons, generate one anti π -graviton.

The figure 19.4.4, as well indicates the formation of a time graviton from closely interacting 4 nos. of force gravitons.

The formation of π Graviton/force graviton from an anti- π graviton/time graviton is shown in Figure 19.4.5 below:

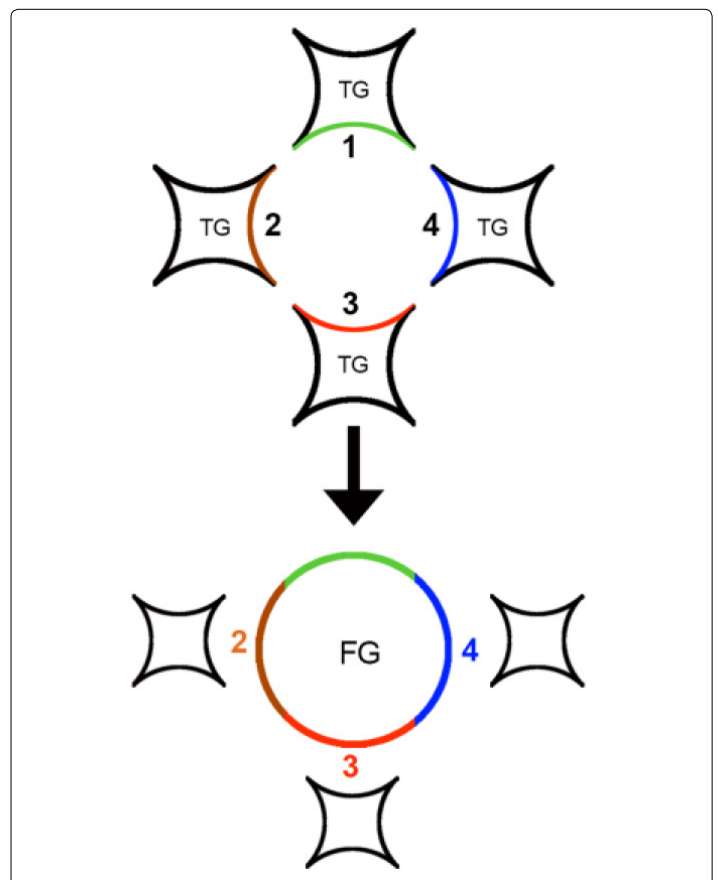


Figure 19.4.5: Formation of a force Graviton (FG) from 4 nos. of Time gravitons (TG) or formation of a π - Gravitons from 4 no. of anti π Gravitons

The characteristic features of the π -Gravitons:

They are rotating circles or spheres and generating orbital paths too.

They are mass less and energy less.

They capture the several dimensionalities of the universe and are the real quantum’s of the push-forward gravitons.

As shown in figure 19.4.3, when a point A in the π -graviton rotates by 180° , the point B moves by 180° too, and as a result overall, there is a $2 \times 180^\circ = 360^\circ$ rotation of π -graviton.

They are the carriers of the uncertainties of the universe in the form of wave, energy... etc.

The characteristics of anti- π gravitons are:

They are empty space rotating 2/3 dimensional with saddle type geometrical shape.

They are the carriers of the certainties, the orders or the masses of the universe and are the quantum’s of the pull-back gravitons.

20. Thermodynamics of super entropic gravitons and generation of multi-dimensionality of the universe

The existence of different equilibrium among push forward gravitons and the pullback gravitons is shown in Table 20.1 below

Table 20.1: Presentation of equilibrium between push forward gravitons and the pullback gravitons.

STEP NO.	STATE OF GRAVITON	EMISSION FROM THE GRAVITON	EQUILIBRIUM BETWEEN PUSH FORWARD AND PULL BACK GRAVITONS	OBSERVABLE PHYSICAL VARIABLES IN EQUILIBRIUM WITH EACH OTHER
1.	$\frac{1}{f^2} = \frac{81}{256\pi^4 r^{10}}$	π	$\frac{81}{256\pi^3 r^{10}} \Leftrightarrow \pi$	Empty space π -graviton or space hole graviton and super entropic graviton
2.	$\frac{81}{256\pi^3 r^{10}}$	r	$\frac{81}{256\pi^3 r^9} \Leftrightarrow \pi r$	Entropy graviton and Black-hole graviton
3.	$\frac{81}{256\pi^3 r^9}$	r	$\frac{27}{64\pi^3 r^8} \Leftrightarrow \frac{4}{3} \pi r^2$	Fourth degree time graviton and push forward /temperature/force graviton
4.	$\frac{27}{64\pi^3 r^8}$	r	$\frac{81}{64\pi^3 r^7} \Leftrightarrow 4 \pi r^3$	Nuclear fusion graviton and first degree energy graviton
5.	$\frac{81}{64\pi^3 r^7}$	πr	$\frac{81}{16\pi^2 r^6} \Leftrightarrow \frac{16\pi^2 r^4}{16\pi^2 r^4}$	EM-wave graviton and 2 nd degree mass graviton
6.	$\frac{81}{16\pi^2 r^6}$	r	$\frac{9}{16\pi^2 r^5} \Leftrightarrow \frac{16\pi^2 r^5}{9}$	Space inversion-space expansion, color graviton of object, and color graviton of EM wave
7.	$\frac{9}{16\pi^2 r^5}$	r	$\frac{9}{16\pi^2 r^4} \Leftrightarrow \frac{16\pi^2 r^6}{9}$	2 nd order time graviton or 2 nd order force or temperature graviton
8.	$\frac{9}{16\pi^2 r^4}$	πr	$\frac{9}{4\pi^2 r^3} \Leftrightarrow \frac{64\pi^3 r^7}{9}$	1 st order mass and nuclear fission graviton
9.	$\frac{1}{4\pi r^3}$	r	$\frac{3}{4\pi r^2} \Leftrightarrow \frac{64\pi^3 r^8}{27}$	Time graviton and X-ray, gamma ray graviton
10.	$\frac{3}{4\pi r^2}$	r	$\frac{1}{\pi r} \Leftrightarrow \frac{256\pi^3 r^9}{81}$	Plasma state graviton and order graviton
11.	$\frac{1}{\pi r}$	π	$\frac{1}{r} \Leftrightarrow \pi$	Order graviton and π graviton
12.	1	r	$1 \Leftrightarrow \pi r$	Enlarged singularity and entropy graviton

STEP 1: The singularity graviton throws out an empty space π -Graviton, to create a space hole. This makes the room for the entropy graviton, to form. The singularity graviton gets enlarged in its size once the said π -graviton is emerged out of it.

STEP 2: The phase inversion occurs of an order graviton, so it transforms from r^{-1} to r and it enters the π -graviton, awaiting the arrival of the incoming r in it. This way, an entropy graviton is formed first. It exists in equilibrium with a left out Black Hole Graviton.

STEP 3: An another order graviton (r^{-1}) again inverts its phase and

adds to the already formed entropy graviton to form a temperature or force graviton. The equilibrium is then established between a gravitational collapse graviton and a temperature graviton.

STEP 4: The Gravitational collapsing graviton then releases another r to form an energy graviton. Equilibrium now does exist between nuclear fusion graviton and energy graviton. The energies are the outcome of the nuclear fusion reactions.

STEP 5: The nuclear fusion graviton then releases a π -hole graviton and again gets enlarged in volume.

STEP 6: The enlarged nuclear fusion graviton then releases an r and which enters the already emitted π - graviton to form entropy graviton and this in turn gets hybridized with energy graviton to form EM-wave graviton. The equilibrium now does shift and exists between EM-wave graviton and the second degree mass graviton or the 3rd degree time graviton.

STEP 7: The second order mass graviton releases another r and an equilibrium is established between a space inverting graviton and space expansion graviton or could be called as an equilibrium phenomena between acceleration and inverse acceleration. This is also the existence of equilibrium between object color and EM-wave color.

STEP 8: The space inverting graviton releases r to form equilibrium between 2nd order time graviton and 3rd order temperature/force graviton or second order energy graviton.

STEP 9: The second order time graviton releases a π -graviton and gets enlarged.

STEP 10: The enlarged second order time graviton releases an r to form a nuclear fission graviton. The equilibrium now then exists between

1st degree mass and nuclear fission graviton. The nuclear fission converts the higher degree masses to the lower degree masses.

STEP 11: The 1st degree mass graviton releases an r and equilibrium is established between time graviton and X-ray/gamma ray graviton or 4th degree temperature/force graviton.

STEP 12: The 1st degree time graviton releases an r to form an order graviton. The equilibrium is shifted and is established between plasma state graviton or 3rd degree energy graviton and an order graviton.

STEP 13: The order graviton releases a π -graviton

STEP 14: The enlarged order graviton then emits an r and an entropy graviton is formed again.

The life cycle of a singularity graviton is completed with the generation of entropy and the universe gets enriched with entropy more and more and as a result the universe goes on expanding and expanding. It will be shown later that this leads to a flattening of the geometrical shape of the universe and the universe tends to flat universe with time.

20.1 ‘Gravitational Waves’ [96] and Representations of the Gravitons in Regard to ‘ThermalExpansion Co-efficient’

Table 20.1.1: Presentation of ‘Gravitational waves’

SL NO.	GRAVITON NAME	DIMENSIONALITY	BREAK-UP OF DIMENSIONALITY TO WAVE FORM AS A HYBRID OF MASS AND ORDER
1.	Order graviton	r^{-1}	$\frac{1}{r^3} x \frac{1}{r^{-2}}$ Mass x (order) ⁻²
2.	Time graviton	r^{-2}	$\frac{1}{r^3} x \frac{1}{r^{-1}}$ Mass x (order) ⁻¹
3.	1 st degree mass graviton	r^{-3}	$\frac{1}{r^3}$ Mass x (order) ⁰
4.	2 nd degree time graviton	r^{-4}	$\frac{1}{r^3} x \frac{1}{r}$ Mass x (order) ¹
5.	Space inversion graviton	r^{-5}	$\frac{1}{r^3} x \frac{1}{r} x \frac{1}{r}$ Mass x (order) ²
6.	2 nd degree mass graviton	r^{-6}	$\frac{1}{r^3} x \frac{1}{r^3}$ Mass x (order) ³
7.	Nuclear fusion graviton	r^{-7}	$\frac{1}{r^3} x \frac{1}{r^4}$ Mass x (order) ⁴
8.	Gravitational collapse graviton	r^{-8}	$\frac{1}{r^3} x \frac{1}{r^5}$ Mass x (order) ⁵
9.	Black-Hole graviton	r^{-9}	In the form of particle Black Hole Mass x (order) ⁶

The EM-waves are ‘Energy-entropy’ hybrids and are dispersive wave in the sense, that these waves are originated from a point and spreads all over the space.

On the contrary, the gravitational waves are ‘mass-order’ waves. These are squeezing waves. These waves are generated from the various pull back graviton interactions amongst themselves, and bounces back to the origin and hence are called ‘squeezing’ EM waves. In Table 20.1.1, the various graviton waves are explained with the break-up of the dimensionalities of the respective parent gravitons.

All the gravitons, we have referred in this article, are very much existing in the nature and we are encountering them or using them in our day to day life. We could not, however, recognize them as gravitons. Now in the light of the unified quantum gravity theory of the universe, they are being recognized and they come up-front.

We will now briefly discuss about the pull-back gravitons:

ORDER GRAVITON r^1 : This could be related to the order of a reaction. When the order of a reaction is 0.66, $n=0.66$, put Eqn. (19.3.5) an order graviton is generated. The opposing potential difference or back voltage, the reverse capacitance called elastance is order gravitons in the form of r^1 .

TIME GRAVITON r^2 : The thermal expansion co-efficient is also a time graviton. The thermal expansion co-efficient is, α

$$\alpha = (1/V) dV/dT \quad (20.1.1)$$

Where V is the volume, T is temperature. If we put the dimensionalities of V and T in the above equation, we get,

$$\alpha = (1/r^3) \times (r^3/r^2) = (1/r^2) \quad (20.1.2)$$

So thermal expansion co-efficient is a time graviton and which is elaborated below:

Force = Mass x Acceleration

$$\begin{aligned} \frac{1}{Force} &= \frac{1}{Mass} \times \frac{1}{Acceleration} \\ &= \frac{4\pi r^3}{9} \times \frac{9}{16\pi^2 r^5} \\ &= \frac{3}{4\pi r^3} \times \frac{3}{4\pi r^2} \times \frac{1}{3} = 3x \frac{1}{V} x \frac{1}{T} \cdot \frac{4\pi r^3}{3} \end{aligned} \quad (20.1.3)$$

$$Time = \frac{3}{Force} = \frac{1}{V} \left(\frac{dV}{dT} \right) \quad (20.1.4)$$

So the thermal expansion co-efficient, tangibly being a ‘Time Graviton’ only.

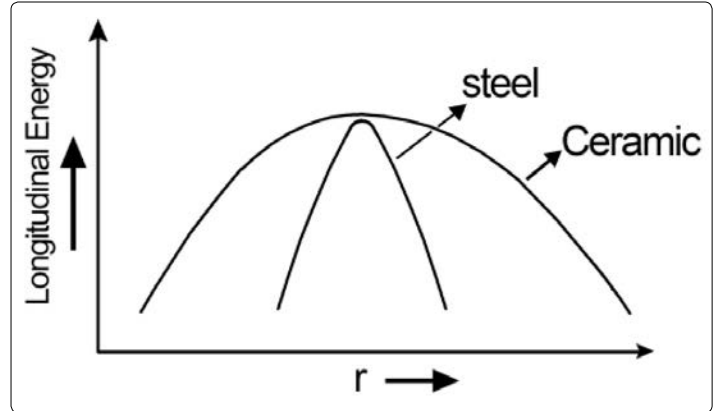


Figure 20.1.1: Longitudinal energy distribution of ‘steel’ & ‘ceramic’

Due to higher level of attractive forces acting among the molecules, the energy distribution pattern of iron/steel is narrower. The ‘energy – r’ curve is sharpened longitudinally. The natural tendency of matter is to homogenize the longitudinal and transverse energy and as a result iron or steel on heating, expands faster, since the transverse energy increases faster and the material elongates faster.

In materials like, for example, ceramic, bricks, the longitudinal energy distribution and transverse energy distributions are more or less equal in magnitude and the ‘energy-r’ curves for such type of materials is already broader and not longitudinally sharpened type, as that of iron/steel. This is the reason the expansibility of ceramic material are lower in magnitude than that of iron/steel. This phenomenon is shown in figure 20.1.1 below in the form of shape of energy distribution pattern of Steel and a typical ceramic material

Mass graviton, r^3 : These are basically the 1st degree masses and can be represented as a hybrid of thermal expansion co-efficient and order graviton or opposing potential difference :

$$Mass = (1/r^2) \times (1/r) \quad (20.1.5)$$

2nd order time graviton, r^4 : It is basically anti-magnetic field and can be represented as 2nd degree thermal expansion co-efficient. So this is a higher level attractive force.

Space inverting graviton, r^5 : This can be represented as the hybrid of mass graviton and thermal expansion co-efficient in the form:

$$\text{Space inverting graviton} = (1/r^3) \times (1/r^2) \quad (20.1.6)$$

$$(81/256\pi^3 r^9) \rightleftharpoons \pi r \quad (20.1.11)$$

2nd order mass graviton, r^6 : These are the third degree thermal expansion co-efficient or condensed masses. Here also the attractive forces are pretty high.

Nuclear fusion graviton, r^7 : These gravitons are the hybrids of the space inverting graviton and thermal expansion co-efficient gravitons or may be better understood as the hybrid of mass and 2nd degree thermal expansion co-efficient, as

$$\text{Nuclear fusion graviton} = (1/r^3) \times (1/r^2) \times (1/r^2) \quad (20.1.7)$$

The very high attractiveness leads to the fusion of the masses.

Gravitational Collapse Graviton, $(1/r^8)$: This is basically, a very high degree of attractive forces and is indeed 4th degree thermal expansion co-efficient.

Black Hole Graviton: These are the 3rd degree masses or can be visualized as a hybrid of 4th degree thermal expansion co-efficient and an opposing potential difference or order graviton.

$$\text{Black-Hole Graviton} = (1/r^2) \times (1/r^2) \times (1/r^2) \times (1/r^2) \times (1/r) \quad (20.1.8)$$

Most of the push-forward gravitons have already been explained. The nuclear fission graviton being r^7 , is a hybrid of power or acceleration or space expansion graviton (r^5) with a force graviton, r^2 .

The X-rays or the gamma rays, r^8 , have already been explained and these are 4th degree force/temperature gravitons. This can also be visualized as the hybrid of power (r^5) and energy (r^3)

The plasma state, r^9 , is very high in energy and is a 3rd degree energy graviton.

What then is the wave particle duality?

If one just has a close look at Table 20.1, the existences of the following equilibriums are found:

$$(9/4\pi r^3) \rightleftharpoons (64\pi^3 r^7/9) \quad (20.1.9)$$

$$(81/16\pi^2 r^6) \rightleftharpoons 16\pi^2 r^4 \quad (20.1.10)$$

Now in equation (20.1.9), equilibrium does exist between the 1st degree mass and nuclear fission gravitons. Nuclear fission gravitons are basically in the form of wave as :

$$r^7 = r^6 \times r = (r^3)^2 \times r \quad (20.1.12)$$

So the nuclear fission gravitons are the hybrids of 2nd degree energy and entropy. As a result, a 1st degree mass is always surrounded by an intense EM wave. This is in fact, what the wave-particle duality is.

Similarly, one finds from Eqn.(20.1.10), that a second degree mass is in equilibrium with 1st degree EM wave. So this is another wave-particle duality.

Lastly, the third degree mass is in equilibrium with a hybrid of zero degree energy and entropy.

The 3 different wave-particle duality phenomena as is arisen from the pull back and push forward gravitons is shown schematically shown below

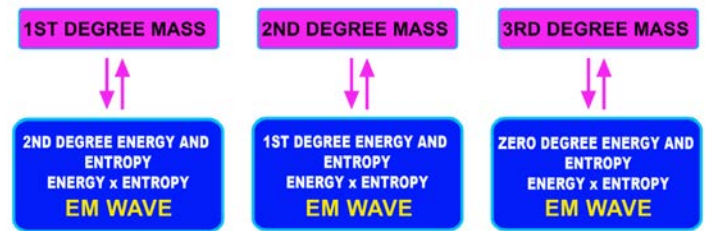


Figure 20.1.1a: “MASS-EM WAVE” equilibriums of the universe

21. Transition of the universe from a coiled state to a flat state (or from an integrated form to differential form)

In many scientific articles it has been cited that the universe is a flat type universe. This is in fact a true surmise and this will be explained now :

The singularity graviton is in the form of r^{-10} and the order of the universe is 2.33). Once this said graviton disintegrates to form entropy, the order of the universe does pass on to 1.33. The change of order of the universe against the development of push forward gravitons is shown in Table 21.1.1.

21.1 Order of the Universe and the Origin of the 'Push Forward' Gravitons

Table 21.1.1: Order of the Universe and the Evolution of Push Forward Gravitons

SL NO.	DIMENSIONALITY OF PULL-BACK GRAVITONS	ORDER OF THE UNIVERSE	DIMENSIONALITY OF PUSH-FORWARD GRAVITONS	EVOLVED PUSH-FORWARD GRAVITONS	ORDER OF THE UNIVERSE
1.	r^{-10}	-2.33	r^0	Super entropic	-2.33
2.	r^{-9}	-2	r^1	Entropy	1.33
3.	r^{-8}	-1.66	r^2	Force or temperature/charge	1.66
4.	r^{-7}	-1.33	r^3	Energy	2.00
5.	r^{-6}	-1	r^4	EM wave	2.33
6.	r^{-5}	-0.66	r^5	Acceleration or space expansion	2.66
7.	r^{-4}	-0.55	r^6	Photoelectric or 2 nd degree energy	3.00
8.	r^{-3}	0.00	r^7	Nuclear fission	3.33
9.	r^{-2}	0.33	r^8	X-ray, gamma ray	3.66
10.	r^{-1}	0.66	r^9	Plasma state	4.00
11.	r	1.33	r^1	Entropy	1.33

The order of the universe in the integrated form in super entropic/singularity gravitons being - 2.33, is the singularity. From the singularity, it does pass on to a state of 1.33 and with the evolution of the other gravitons one after another, the order is being peaked in the plasma state (order is 4) and then again falls back to the original entropic graviton and which is again 1.33.

This explains most satisfactorily, the Black-Body radiation or the UV catastrophe phenomena. The intensities of the Black Body radiation curves have to fall back to the origin. The value of r decreases reaches a maximum and then again falls back to the origin. The said entropy-entropy cycle and the variation of order of the universe are shown in Figs.21.1.1 and 21.1.2 respectively,

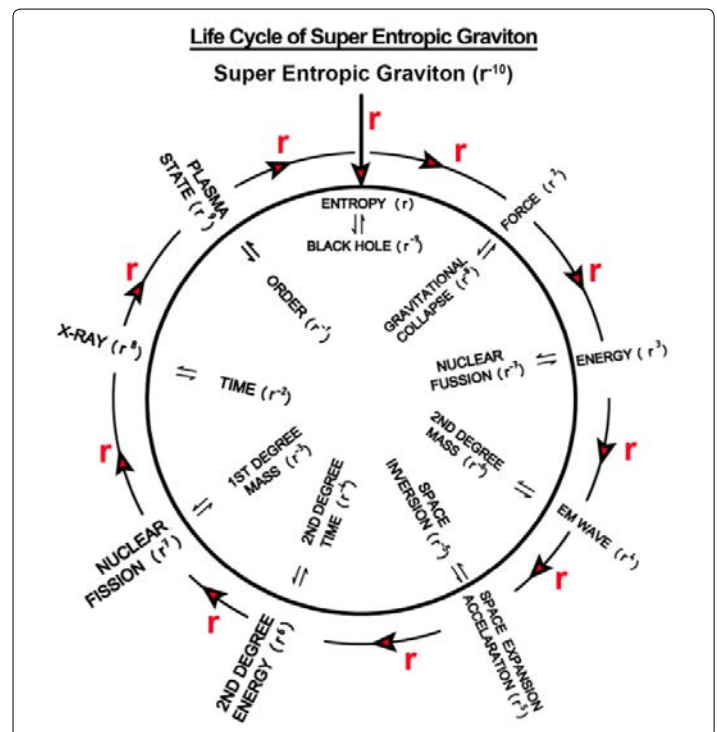


Figure 21.1.1: Life cycle of a super entropic graviton

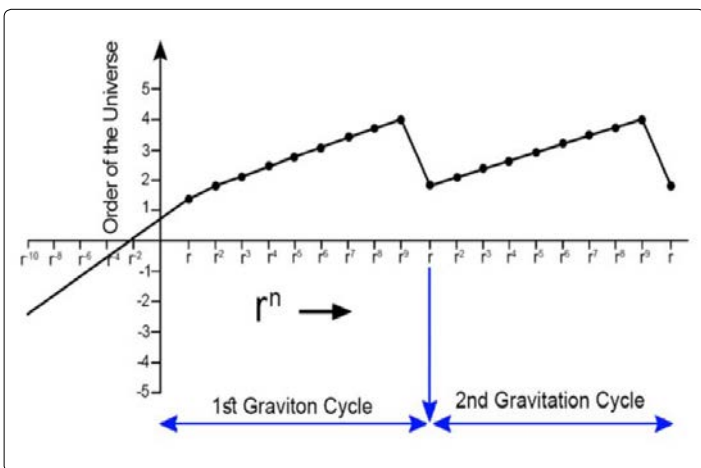


Figure 21.1.2: Graphical presentation of Graviton Cycles vis-a-vis order of the Universe

The universe at the instant of its birth was in a very much integrated form. All the dimensions were being coiled up to a so called ‘SINGULARITY’.

This can be compared with the form of a random coil polymer chain. This remains in a coiled form and when it is being un-coiled by applying shear forces, slowly and slowly, the chain gets uncoiled or gets straightened up. From a very much integrated and coiled geometry, it does pass on to a linear form.

This universe is also like a polymer coil too. Along with the decay of the gravitons, or the decay of time, the universe from a spherical shape is continuously passing on to a flat and flatter shape. This is equivalent saying “The universe from a very much integrated form is slowly attaining differential or flat shape with decay of time”. The concept is shown below in figure 21.1.3

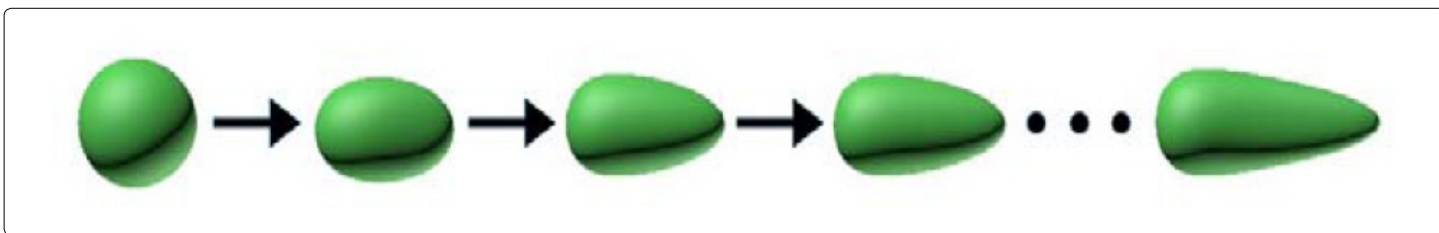


Figure 21.1.3: Concept of formation of the flat Universe

The enormous entropies are being generated and at the thrust of the entropy, the universe expands, but become flat too.

The following figures are self-explanatory and reveals the cosmic mysteries of the universe

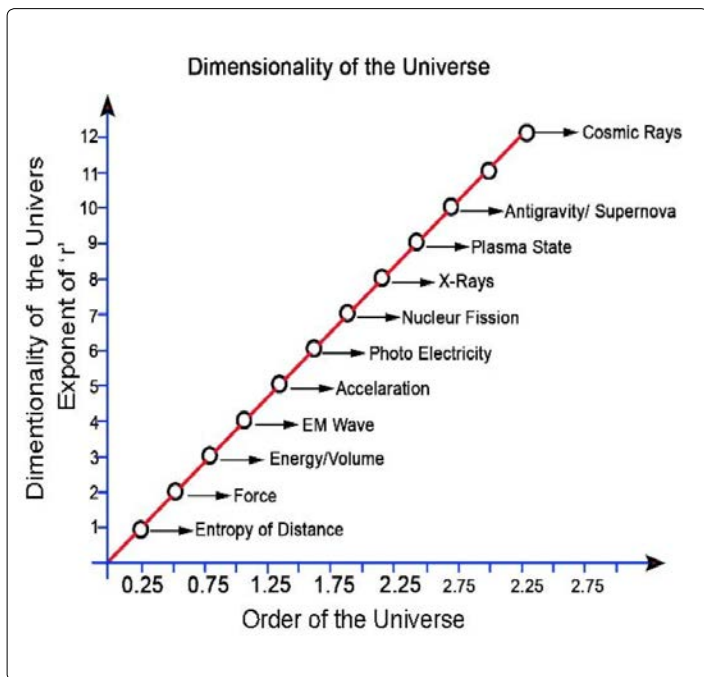


Figure 21.1.4: “Graviton- Order of the Universe” correlation diagram

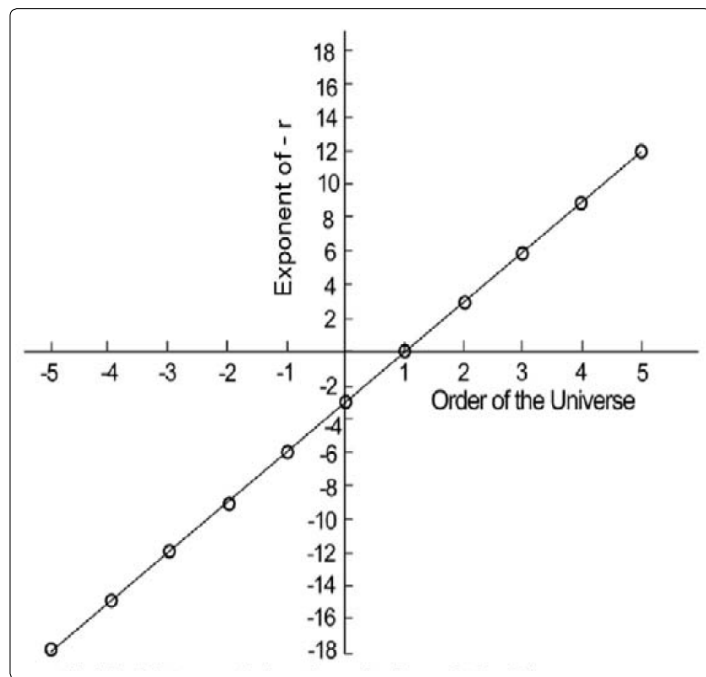


Figure 21.1.5: “Entropy- Order of reaction” correlation Diagram

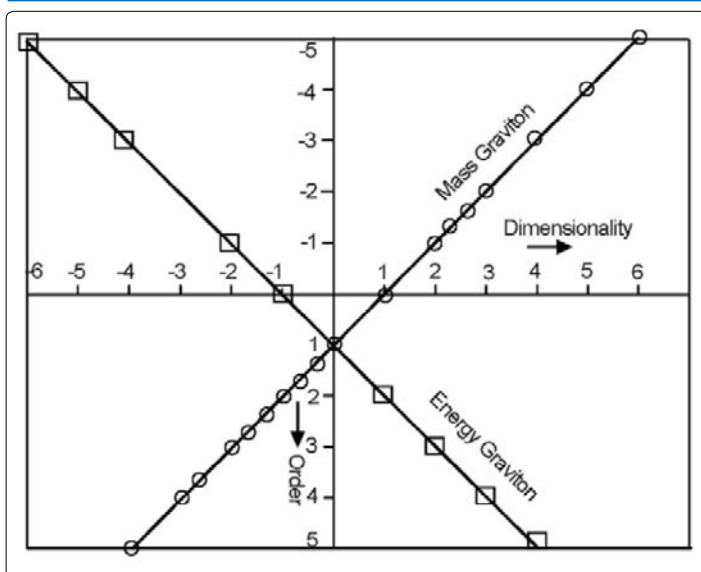


Figure 21.1.6: Order and Dimensions of Mass/Energy

A very good analogy can be given regarding the evolution of the universe to a spray painting process.

In a spray application of Paint, the paint particles (in the liquid form) are mixed with air, first. This is similar type as that of the blending of π -gravitons with the other gravitons as already explained.

During a spray painting process, the liquid paint being in a small spray cup (as like pull back gravitons) is forced out of the cup (by opening a valve) due to the gravity. As soon as the paint flows out of the spray cup, it is being mixed with pressurized air to form smaller and smaller 'Paint-air droplets'. This process in the terminology of paint is called 'atomization' and the innumerable paint-air droplets are spread over all the directions in space.

The gravitons, the pullback ones being in the state of blended with anti π empty space gravitons, upon phase inversion are being sprayed all over the universe. As if someone invisible to us, is standing up and are continuously spraying on to us (the universe) the gravitons, in the form of push forward from a 'PULL- BACK GRAVITON – ANTI π -BLEND SPRAY CUP'.

21.2 Gravitation and Forces of the Universe

We would like to emphasize the fact, that there is no need to consider separately a variable as 'gravitational force'. All the forces of the universe are it attractive or repulsive are originated from the gravitons only.

Near a Black-Hole the attractive pull is pretty high, while near a plasma state, the attractive pull is quite, quite low. The repulsive or the dispersive forces are very higher in magnitude in plasma state.

The Graviton waves are spread all over the universe in the form of squeezing 'mass-order' waves. Standing at a certain distance from the surface of the earth, one would experience an impact of an average attractive pull towards the earth surface, since the said

mass-wave pull back waves are averaged out all over the space surrounding the earth.

The decay of the gravitational pull of the pull back gravitons is enormous. The dimensionality from the order of r^{10} reaches to the order of r^1 , once a phase inversion of an order graviton takes place in a pullback graviton, the graviton increases in its size. Whenever an anti π -graviton is thrown away, the increase in size of the graviton is considerably higher. Higher would be the size of the pull back gravitons; lower would be the pull back efficiency or capability.

Pull back power of a pullback graviton

$$\propto [(1/\text{size of graviton})]$$

$$\propto [(1/\text{index of } r)] \quad (21.2.1)$$

So, all through the life cycle of a super entropic graviton, the pull back efficiency/force starting from a very high level, drops down to a very low magnitude of entropic gravity.

The reverse is true for the push-forward gravitons. Higher be it in size, higher is the repulsive or dispersive forces, the dimensionality starting from r^1 reaches to r^9 . In case of the push forward gravitons,

Push forward efficiency of a push forward graviton

$$\propto [(\text{size of the graviton})]$$

$$\propto [(\text{index of } r)] \quad (21.2.2)$$

So the gravitons in fact cover, all the forces of the universe starting from very low to very high. All the following forces do come, under the umbrella of gravitons:

Weak Nuclear Forces

Strong Nuclear Forces

Electro-magnetic Forces

Gravitational Forces.

This article now comes to an end. By considering the 1st degree super entropic gravitons, one cannot, however, explain the 12-dimensional phenomena, like Supernova or Anti-gravity. If the second degree singularity gravitons are being considered, which will in the form of $(1/r^6)$, or r^{20} , the said antigravity phenomena can, however be explained.

21.3 Infinite Dimensionality [97] of the Universe

If we consider one after another the 2nd, 3rd, 4th, 5th,..... degree singularity gravitons, we will land up to a state of infinite dimensionality of the universe, and we can never come to know the limit of it. The Table 21.3.1 in connection with the said fact can be looked into.

Table 21.3.1: Emerging Infinite Dimensionality of the Universe

SL NO.	STATE OF DEGREE OF SUPER ENTROPIC GRAVITONS	MATHEMATICAL FORM OF THE SUPER ENTROPIC GRAVITONS/SINGULARITY	EMERGED DIMENSIONALITY	ORIGIN OF THE SUPER ENTROPIC GRAVITONS
1.	1	$(81/256\pi^4 r^{10})^1$	10	Interactions among 1st degree masses
2.	2	$(81/256 \pi^4 r^{10})^2$	20	Interactions among 2nd degree masses
3.	3	$(81/256 \pi^4 r^{10})^3$	30	Interactions among 3rd degree masses
4.	4	$(81/256 \pi^4 r^{10})^4$	40	Interactions among 4th degree masses
5.	5	$(81/256 \pi^4 r^{10})^5$	50	Interactions among 5th degree masses
6.	6	$(81/256 \pi^4 r^{10})^6$	60	Interactions among 6th degree masses
7.	7	$(81/256 \pi^4 r^{10})^7$	70	Interactions among 7th degree masses
8.	8	$(81/256 \pi^4 r^{10})^8$	80	Interactions among 8th degree masses
9.	9	$(81/256 \pi^4 r^{10})^9$	90	Interactions among 9th degree masses

So from Table 21.3.1, it turns out that the universe may be viewed as an entity of infinite dimensionality. So when 1st degree masses are considered for the evolution of gravitation and the associated singularity, this universe is 10 dimensional. So it can be concluded that the universe is pseudo -10- dimensional if the singularity is considered to be inverse 10 dimensional.

22. CONCLUSION:

The proposed theory of “Unified Quantum Gravity Theory of the Universe”, why is being called a unified theory, requires no explanation. It has brought the following Branches of Science under a single umbrella and have given altogether new shapes and identified the inconsistencies therein:

NEWTON’S LAWS OF MOTION;

EINSTEIN THEOREIES OF GENERAL AND SPECIAL RELATIVITY;

THE PHOTOELECTRIC PHENOMENA AND THE BLACK BODY RADIATION;

PLANCK LAWS OF HARMONIC OSCILLATOR AND PLANC UNITS;

QUANTAM MECHANICS AND HISENBERG’S UNCERTAINTY PRINCIPLE;

CHEMICAL THERMODYNAMICS;

ALL TYPES OF FUNDAMENTAL FORCES OF THE UNIVERSE;

THE DIMENSIONALITY OF THE UNIVERSE;

WAVE-PARTICLE DUALITY;

TRUENESS OF THE COLD NUCLEAR FUSION PHENOMENA;

COLOR PHYSICS

At the same time, it has opened up a new horizon and the world science will take a new turn holding the hand of “UNIFIED QUANTUM GRAVITY THEORY OF THE UNIVERSE”.

This theory has discovered the universe in a newer way, in the absolute forms of the physical variables. As of now, the physical variables are all in the form of either relative ones or in a state of being undefined, as for example the mass and the time. As a result of this, many miss concepts are persisting in Science. Now the opportunity has come to rectify the miss concepts and redefine length, mass and time in a newer way in the forms of:

LENGTH - multiple of entropy graviton

MASS - multiple of mass graviton

TIME - multiple of time graviton

The measurement scales, have to be changed for all the physical variables of the world and it is being expected that the world scientific community will sit together and finalize.

The essence of this bit lengthy article is that the universe is taking the human race, the animal kingdom, the trees, the rivers and the oceans to pass on to a subtle existence or thinner existences. Since the universe is pushing up to flat geometry, the masses would get thinner and thinner in their depths.

A subtle or spiritual existences of the living animals of the universe are being foreseen, thousands and millions years from now.

This proposed theory does, however, needs no proof since the physical variables/gravitons discussed in this article are very much existing in front of us, very much alive. Unfortunately, we could not recognize them as what they are in reality.

The researchers are running from one end, to the other end of the world or the universe rather, in the search out of 'GRAVITONS' but they are existing in the very next door step.

The entropy gravitons have a difference in potential at its two ends and that's the reason they are 'voltage gravitons'. The one end is carrying the positive potential of the nucleus, and the other end is carrying the negative potential of the electrons and these are the entropy gravitons only, from where all the sub-atomic particles have been emerged.

The authors are preparing an article entitled "THERMODYNAMICS OF THE EVOLUTION OF THE SUB-ATOMIC PARTICLES, THE DARK MATTER, THE DARK ENERGIES AND THEIR KINETICS – AN UNIFIED QUANTAM GRAVITY THEORY APPROACH" to be published.

The two questions, very relevant to the subject matter, might be raised and those are :

Can we view our past happenings?

Can we foresee our future?

The authors sound very positive to the first question. Yes, we can possibly view our past.

The dark energies of the universe carry the finger prints of all the past happenings of the universe.

If the technology can be suitably developed to analyze them, yes we sit in the chair of a theatre, we can view all the past in front of

us upon a white screen, for example, the past historical incidents starting with the dissidence of Jesus Christ, the fall and rise of Roam, the American revolution, the renaissance.... etc... and etc.

The answer to second question will be given in another article yet to come "SEARCH FOR THE EXTRA CELESTIAL INTELLIGENCE AND THE FUTURE OF THE UNIVERSE", which is to be published.

To the end, the authors would like to comment, that this article is not the end of the beginning, of a long awaited amazing theory of quantum gravity. This in fact, is the beginning of a new era in science. Though the each and every beginning does have an end mostly, but this beginning is going to be unique and endless in reality.

Innumerable mysteries of the universe will be revealed, one after another, holding the hand of the proposed theory of quantum gravity, through the sustained, vast and intensive research activities throughout the entire world.

The authors also presume that, thousands and millions of questions would be raised too, from the different corners of the globe. The authors are fully geared up to put forward the answers of each and every question very firmly with 'logic and philosophy' of the maiden "UNIFIED THEORY OF QUANTUM GRAVITY"

Parameter ' π ' and the mass-volume and mass-energy equivalence of the universe:

In Fig.19.4.4, how 'time-gravitons' are being formed from 'force-gravitons' have been presented. On the contrary, in Fig.19.4.5, how the 'force-gravitons' are formed from 'time gravitons' have been presented.

Now, if the Figs.19.4.4 and 19.4.5 are being considered in 3-dimension rather than in 2-dimension, then the circles in the said figures will be replaced by spheres (to represent volume) and the 2-dimensionioal saddles would be replaced by 3-dimensional saddles(to represent mass) .

From Fig.19.4.4, it is found that from 4 quanta's of volume gravitons, 3 quanta's of volume gravitons and 1 quanta of mass gravitons are formed. So, 75% is retained as volume and 25% of the volume is inverted to form mass and that is (1/25)

$$\text{So, mass x volume} = (1/25) \times (75) = 3$$

Now, since energy, $E = 3V$, one can write, $m \times E = 9$.

Similarly in Fig.19.4.5, it is found that from 4 nos. of quanta's of mass gravitons, 3 quanta's of masses and 1 quanta of volume are formed. So 75% is retained as mass and 25% is inverted to form volume and which is (1/25)

$$\text{So, mass x volume} = (75) \times (1/25) = 3$$

Again for the same reason of the energy-volume equivalence as cited above, one can conclude

$$mE = 9$$

So, the mass-volume and mass-energy equilibrium as derived at the very beginning of this article, is fully supported from geometrical and mathematical angles.

This piece of work is like the garland of a necklace, with the most precious pearl pointers, collected from the novel vast work of the renowned scientists, the champions of the champions, namely Sir Isaac Newton, Sir Max Planck, Sir Albert Einstein and Sir Stephen Hawking.

This work is being dedicated to the above said Godly geniuses.

APPENDIX – 1:

Table A-1: Growth pattern of positive numbers

BASE POSITIVE NUMBERS	INCREASED POSITIVE NUMBER	MAGNITUDE INCREASE	PERCENTAGE INCREASE OVER BASE POSITIVE NUMBER
1	2	1	$(1/1) \times 100 = 100\%$
2	3	1	$(1/2) \times 100 = 50\%$
3	4	1	$(1/3) \times 100 = 33.3\%$
4	5	1	$(1/4) \times 100 = 25.0\%$
5	6	1	$(1/5) \times 100 = 20.00\%$
6	7	1	$(1/6) \times 100 = 16.66\%$
7	8	1	$(1/7) \times 100 = 14.44\%$
8	9	1	$(1/8) \times 100 = 12.5\%$
9	10	1	$(1/9) \times 100 = 11.1\%$

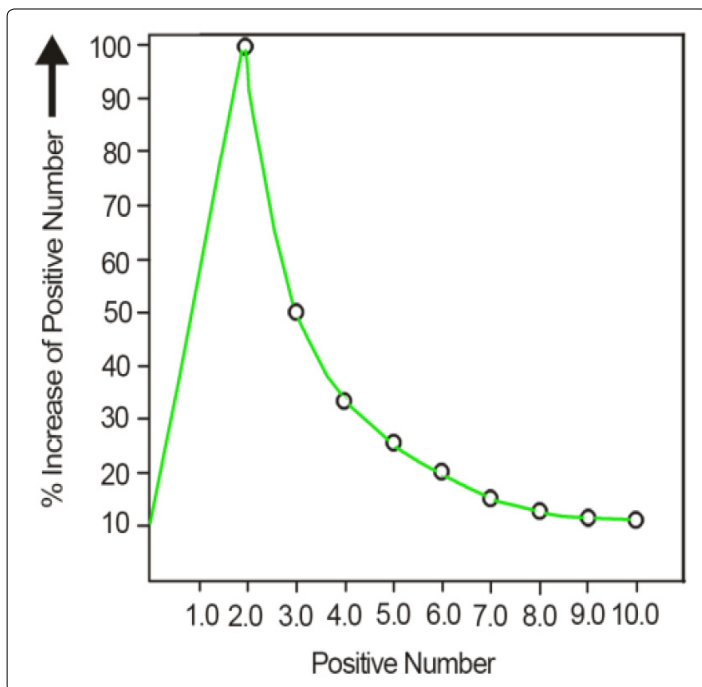


Figure A.1.1: Percent increase of positive Number 1 to 10

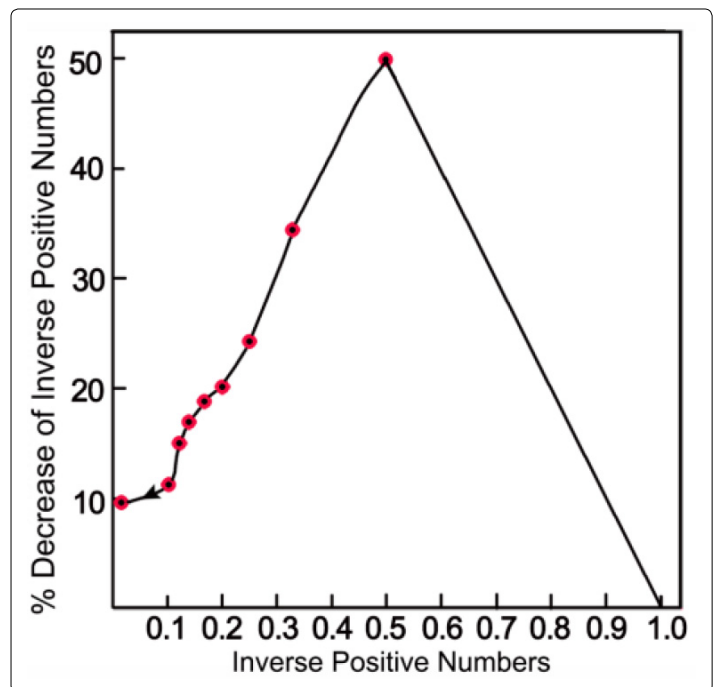


Figure A.1.2: % Decrease of Inverse Position Number

APPENDIX – 2:

Table A-2: De-growth pattern of inverse positive numbers

BASE POSITIVE INVERSE NUMBERS	INCREASE POSITIVE INVERSE NUMBERS	MAGNITUDE DECREASE	PERCENTAGE DECREASE OVER BASE POSITIVE NUMBER
1	0.5	0.5	50%
0.5	0.33	0.17	34%
0.33	0.25	0.08	24.2%
0.25	0.20	0.05	20.0%
0.20	0.167	0.034	16.5%
0.167	0.143	0.023	14.37%
0.143	0.125	0.018	12.5%
0.125	0.111	0.015	11./2%
0.111	0.10	0.011	9.9%

APPENDIX – 3 : Geometry, Mathematics and Physics of Circle to 2-Dimensional Saddle Formation

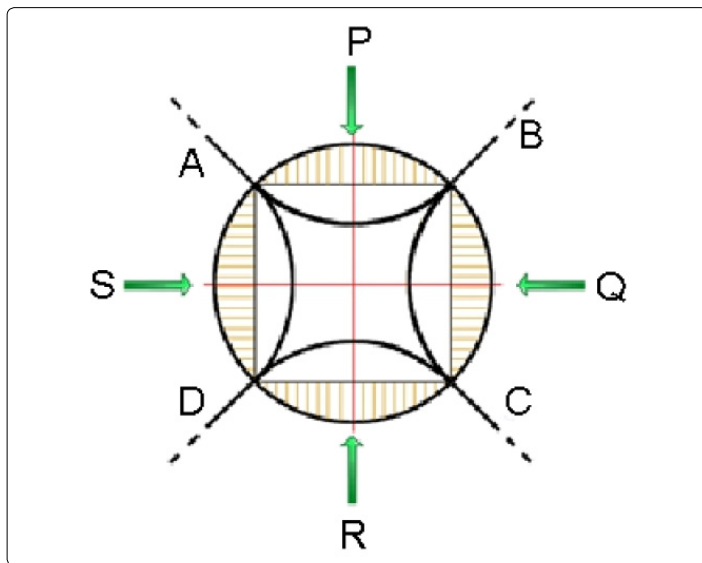


Figure-A 3.1: 2- Dimensional Saddle ABCD

In the above figure, how a circle inverts to a 2-dimensional saddle, has been shown geometrically. A circumscribed circle (C) of the square ABCD, inverse the curvatures at point A, B, C & D respectively, and as a result, a 2-dimensional saddle (IC) is formed. In the figure please note that,

$$\text{The area of the lined portion} = \text{AREA P} + \text{AREA Q} + \text{AREA R} + \text{AREA S} \tag{A.3.1}$$

So, if the area of the lined portion can be obtained mathematically, the area of the saddle IC, would be obtained upon subtracting the sum of (AREA P + AREA Q + AREA R + AREA S) from the area of the square ABCD since the area of the unlined portion around the saddle is same as the area of the lined portion.

Let us consider that the radius of circle C is, equal to 1 Planck length.

$$\text{So the area of the circle, } C = \pi(1)^2 = \pi. \tag{A.3.2}$$

If the length of each side of the square, ABCD is k, then from geometrical point of view

$$1^2 = \left(\frac{k}{2}\right)^2 + \left(\frac{k}{2}\right)^2$$

$$\text{So } k = \sqrt{2}$$

So the area of the lined portion = $\pi - (\sqrt{2})^2 = (\pi - 2) = 1.14 =$ unlined portion surrounding the saddle.

So the area of the saddle = $(2 - 1.14) =$ reciprocal or inverse of the sum total area $(1/1.14)$ of lined sections = 0.86

Now, if the area of the saddle, it is expressed in inversion dimension as $(1/\pi R^2)$ (where R is the Planck length in inverse 2-dimension), then one can write,

$$\text{So } \frac{1}{\pi R^2} = 0.86 \tag{A.3.3}$$

So a unit Planck length in 2-dimensional inverse world is 60% of the Planck length in normal 1-dimension.

APPENDIX – 4 : GEOMETRY, MATHEMATICS AND PHYSICS OF 3 DIMENSIONAL SADDLE FORMATION :

Progressing with the same arguments and logic put forward for 2-dimensional Planck length in Appendix III, one can write

$$\begin{aligned} &\text{Volume of sphere (with radius of 1 Planck length)} \\ &= \frac{4}{3} \pi (1)^3 = \frac{4}{3} \pi = 4.18 \end{aligned} \quad (\text{A.4.1})$$

The length of the each side of the cube, k' (in 3-dimension, the square ABCD as shown in Fig A.3.1 of Appendix III, would turn into a homogeneous cube), would be $(2/\sqrt{3})$

(since the geometrical relation between the radius of a sphere (r) and the length of each side of its inscribed cube (k'), is, $k' = 2r/\sqrt{3}$ and the radius, $r = 1$)

So the volume of the lined portion would be in 3-dimension

$$= \frac{4}{3} \pi - (2/\sqrt{3})^3 = 4.18 - 1.52 = 2.66 \quad (\text{A.4.2})$$

So, volume of the 3-dimensional saddle will be $= (1/ 2.66) = 0.37$

The total volume of the sphere (4.18) would have to be the sum of the following three variables

Volume of the sphere = (volume of the lined portion + volume of the non-lined portion around the saddle + volume of the saddle) = 4.18

or $4.18 = \text{Volume of the non-lined portion} + 2.64 + 0.37$

So the volume of the non-lined portion = 1.15

In fact, in this case, there are space contractions along the each 4 sides of the inscribed sphere of the cube and that is the total volume of the unlined portion outside the volume of the 3 dimensional saddle. The figure A.3.2 is being referred in this context, along the line AB in this said figure the coexistence of expanded and contracted spaces have been shown.

While inverting, the expanded space in Figure A.3.2, contracts and is passing on to the opposite side. On the other hand, it might also be stated that the contracted space when is inverting and passing on to the opposite side is being expanded. This is the phenomenon of “ MUTUAL SPACE EXPANSION – SPACE CONTRACTION”.

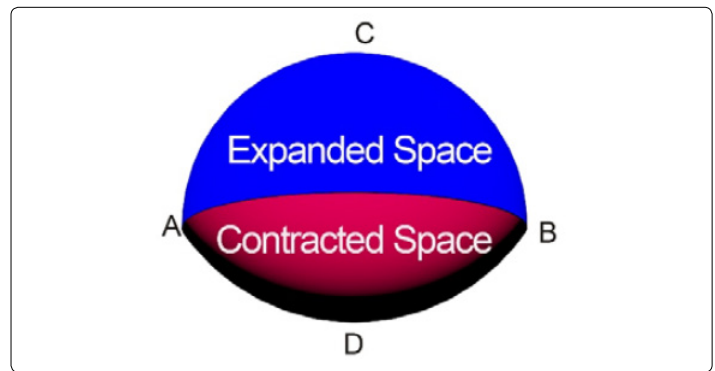


Figure A.3.2: Space Expansion, Space Contraction equilibrium

The time graviton in its attractive form of $(1/\pi r^2)$, in fact acts on the volume in the form of, $\pi(r)^3$ and the volume contracts. From the consideration from the other side, the force graviton being the push forward graviton acts on the contracted space and the volume expands.

If the volume of the 3-dimensional saddle is being considered in the inverse field as $\frac{3}{4\pi R'^3}$, then,

$$\frac{3}{4\pi R'^3} = 0.37$$

$$R'^3 = 0.6$$

$$\text{or } R' = 0.87 \quad (\text{A.4.3})$$

So, a Planck length in normal 1-, 2-, or 3-dimension reduces to 0.87 in inverse 3-dimension, or the Planck length in inverse 3-dimension is 87% of the normal Planck length.

CONCLUSIONS OF APPENDIX 1, 2, 3 & 4:

The conclusions of Appendix 1, 2, 3 & 4 are summarized below -

1. In a normal 1-dimension, the positive numbers (or the variables, increasingly go away from 1 and approaches infinity exponentially (Figs.A.1.1 and A.1.2) and in inverse 1-dimension the inverse positive numbers (or the variables) go away from 1 decreasingly, and approaches zero exponentially, but never attains zero in reality. This is the concept of “SINGULARITY” of the QG theory. In the figure A.1.2, one can notice, how intensely the inverse dimensions tend to “ SINGULARITY” . So the singularity is the point we use in differential calculus as we call the ‘LIMIT TENDS TO ZERO’ .
2. The decreasing magnitude of the positive inverse numbers (or the variables) in inverse 1-dimension, is basically the squeezing of the Planck’s length. On the contrary, in normal 1-dimension, the increasing positive numbers (or the variables) is Planck’s length elongation. So ‘1-dimensioninverse 1-dimension’ is basically an ‘expansion-squeezing equilibrium’ of Planck length. Neither the Planck length attains infinite value in 1-dimension, nor do the inverse Planck lengths attain 0 value in the inverse 1-dimension.

All the geometric and mathematical logics of inverse dimensionality as shown in Appendix I, II, III & IV, are very much related to the pull-back gravitons described in this article and is very much linked to the geometry and shape of the Black-Holes.

The following figures are very much related to understand the concept of ‘Theory of Quantum Gravity’

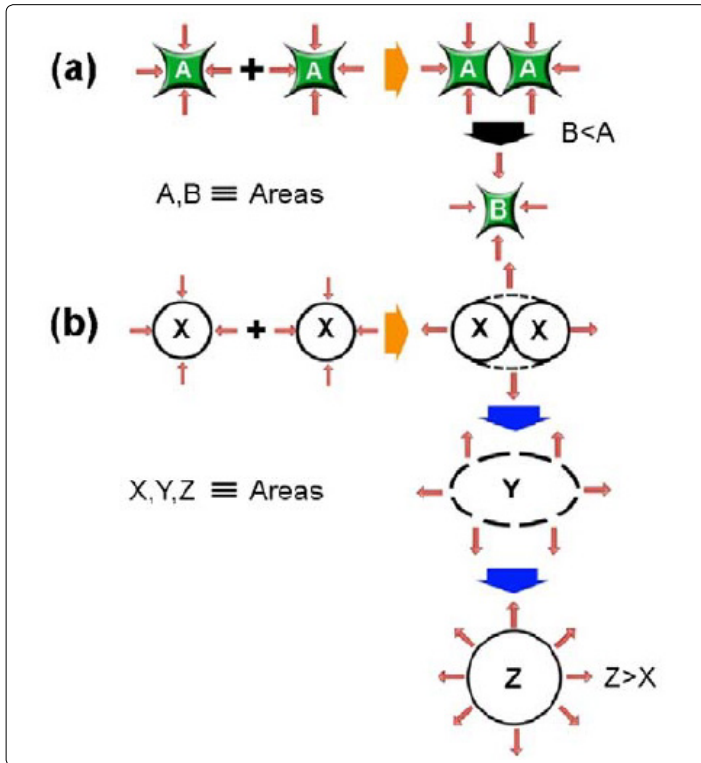


Figure A 4.1: Representation of (a) Decreasing inverse Positive Number and (b) Increasing Positive Number

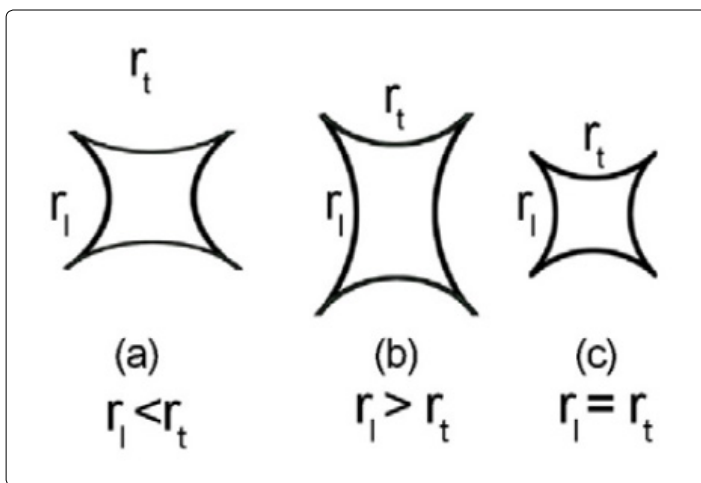


Figure A 4.2: Type Mass Gravitons (a) Longitudinal Mass > Transverse Mass (b) Longitudinal Mass < Transverse Mass (c) Longitudinal Mas= Transverse Mass

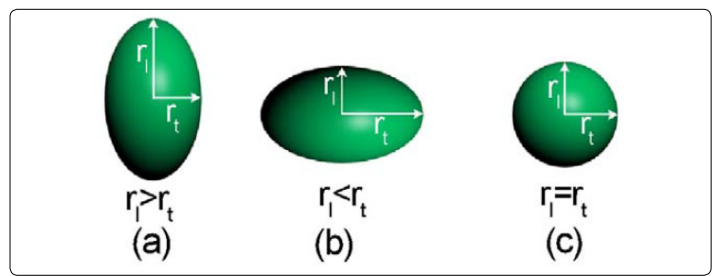


Figure-A 4.3: Different type of Energy Gravitons
 (a) Longitudinal Energy > Transverse Energy
 (b) Longitudinal Energy < Transverse Energy
 (c) Longitudinal Energy = Transverse Energy

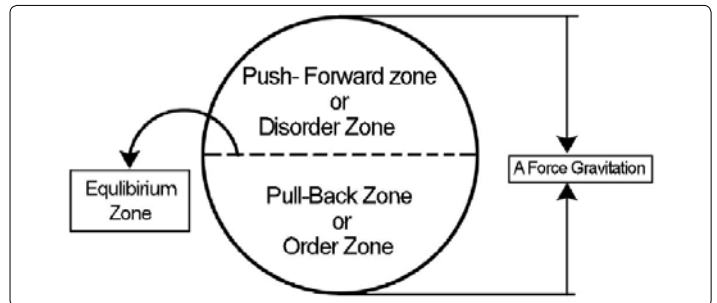


Figure A 4.5: Presentation of a Force Graviton as a sum total of a ‘Disorder Zone’ and an ‘Order Zone’

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