

# PHYSICS BEYOND THE COSMIC HORIZON M-THEORY REVEALS THE PHILOSOPHY OF THE UNIVERSE

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## ABSTRACT

*The universe is an expression of the deepest basic laws of nature. Natural philosophy defines Physics as the ultimate unified framework from which its mechanical principles can be scrutinized. These foundation laws and principles of nature, express the nature of the universe and hence the universe itself. The universe "suffers" from 'naturalness'- It can only be itself. The fundamental study of the universe can easily pass casually as complexity. I herein discuss how M-theory uses longstanding problems in classical physics which when invoked serve as solutions to a singularity theorem. From these, the form and function of the universe can be known, ultimately solving some stubborn, questions that linger on in Western cosmology. I examine some of these laws and principles that in my opinion... the universe is in no hurry to amend and how they shape the properties of the universe.*

## WHAT IS THE UNIVERSE?

The universe is totally of existence. In layman's term it is everything that is around, to a physicist the cosmic microwave background is fundamental proof. Nature too is the universe. If nature at basic levels describes the universe, and the universe is unity (D.W sciama, The unity of the universe -1954. The natural philosophy axiomatized in physics, depicts that a fundamental Theory of everything (ToE) is inevitably plausible for nature thinks and works as a bloc, in drawing the following conclusion I have worked M-theory in cosmology using Brane cosmology (M-theory on a Brane) to yield a surface that I have called M-Brane is a hypothetical structure to which all matter, energy and Quantum information reside, as such - it theoretically mimics the universe. That the universe is in no hurry to amend without much ado I examine these conundrums in classical physics the conclusions they arrive at and the eventual fate that they hold for Western cosmology's taken knowledge on the universe. Without much fuss lets begin.

- The second law of the Thermodynamics.
- The Tri-Body system in Newtonian Mechanics.
- The concept of Entropy.
- The conservation law of energy.
- Mirror symmetry, action and reaction.
- The Hilbert space.

## **THE SECOND LAW OF THERMODYNAMICS**

The universe dictates laws to Theoretical mathematics physics through the entities being studied, not the other way round. These laws of nature teaches mathematical physics how to behave in order to describe reality. Nature does not violate these laws. A physicist is thus bound by these and to fully describe nature must invoke them to the letter and totally for they are invariant, irrespective of the symmetries they are subjected to. The second law of thermodynamic States that Energy cannot be created neither be destroyed but can only be converted from one form to another. The universe in physics can only described in terms of energy, matter and Quantum information. These three obey to the letter the second law of thermodynamics. Energy and mass are related via the Einstein's energy mass equivalence principle. Quantum info in blackholes is totally indestructible. The universe describe in terms of its foundations cannot in reality be created neither be destroyed. Empodocles (490-430 BCE) in his universal system concluded 'Nothing comes to be or perishes, but elements in the universe suffer continual arrangement. The universe cannot be created neither can it be destroyed.

## **PHYSICS MEETS UNIVERSE**

Physics at fundamental levels in highly brittle. Thermodynamics forms the conceptual basis of any theory attempting to describe the universe. If we flout any of these fundamental laws of thermodynamics the postulated theory becomes rickety. This places the theory in an uncomfortable (suicidal) region. The theory can easily falsify itself. In the reality it tries to describe. The Big-Bang theory talks about the creation of the universe- Ekpyrosis (genesis) all matter/energy from a 'tiny' hot dense state into a primordial fireball some 19 Billion years ago. This is a hypothesized account that attempts to explain how all matter/energy were created. This is sheer philosophical violation of the second law of thermodynamics, and renders a theory lack predictive power - for it cannot talk anything about what 'banged', why it 'banged' and the eventual fate. It in fact does not explain why Quantum mechanics works the way it does. The universe cannot be created or be destroyed, the universe necessarily exists by its own wish.

A case in point in day to day life is the water cycle - so fundamental to life. The interconversion of the three Biologically plausible states ad infinitum. This is recycling of these three states –ice(solid) water (liquid) and steam (gas) though dynamic processes, they describe the same entity H<sub>2</sub>O. Such a process is infinite. The water we use today was the same one inside the gut of a dinosaur, or an ancestor partook in a meal. The same will be available for our descendants and other life forms- a drop more or less not. The water cycle is universal (a wter molecule will display such behaviour even when subjected to existence elsewhere), such highly conservative describe the universe – as such a carnot engine, whose minimal entropy is sufficient for eternal (infinite) sustenance (operation).

A thought not coherent with the philosophy (operation/working) of nature easily falsifies itself, and in essence cannot hold much ground. A physicist is a natural philosopher who employs mathematics as a tool to derive and Quantity nature. Physics is intellectual democracy whose legitimate and ultimate rules are autocratically decided by nature (universe).

### **THE 3-BODY SYSTEM**

In classical Newtonian mechanics-which of course is universally drawn. The simplest system in which Newtonian motion as such can be depicted is a 2-Body system. The most complex system at levels is a 3-Body system. If the universe is at unity (exhibits coherence and globally emulates Quantum non-locality). It is a system. A system is instrumentality that combines interacting entities designed to work as a coherent entity. The universe simultaneously displays both complexity and simplicity at any instant. The universe is as such. Complex simplicity, so to is it simple complexity.

Being fully Quantum mechanical, the universe satisfies this three-body system. In Quantum mechanics, no real one particle system exists – (p.weisskopf). The universe is as such described by this paradox – in its complexity yields three fields as a solution.

**The zeroth law is derived from this; that states that if, two bodies in thermal equilibrium with a third body, then the first two bodies are in thermal equilibrium with each other.**

The universe is as such. The 'bending' of space by time and vice versa. To extended postulation the universe bends time too. Being a three body system, so too is time structured (warped) as to the universe's structure into three. Fundamentally time is a scalar quantity defining an event. We can only define an event in the universe relative to its past, present or future. The universe thus must have histories that play along this at any instant/singularity. These are primary attributes (graduations) that time too mimicks (borrows) from the universe. So too are fundamentals-energy, matter & Quantum information. '

### **THE CONCEPT OF ENTROPY - THERMODYNAMIC ENTROPY MEETS SHANNON ENTROPY.**

The universe is a non-generic computer. A computer is basically a transducer. A transducer is any entity responsible for interconverting these fundamentals, energy, matter or Quantum information, while obeying the fundamental law of conservation of energy. The simplest and most basic communication (exchange) system exists, no physical system is 100% efficient as some of its energy, matter or Quantum information cannot be accounted for.

Assuming the M-brane is a highly efficient, isotropic (same in all directions) information system cycling matter within itself. Assuming the observed 2.7k read out on the cosmic microwave background radiation is the 'shanon entropy' of the universe at present

expressed thermodynamically. Instantaneously any two photons located strategically on opposite ends (D-P brane junctions) in the universe communicate (stay in touch) a concept whose effect is extolled as Quantum non locality. The cosmic background radiation persists as both as 'The Thermodynamic and also as Shannon entropy of the universe. It as such depicts the photonic background of the universe.

The Zeroth law applied thermodynamically as such to a 3-Body system gives 2 suprising results- That of a Tri body system with at 0.9 K giving a total readout of  $(0.9 \times 3) = 2.7$  K. the universe is ultimately possible of using the computational products be it energy, matter or Quantum information as its own 'heat' sink hence continue operating infinitely at minimum entropy levels.

If the basics- energy, matter & Quantum information were to be visuaised as a camp fire made of wooden sticks,then entropy exists as smoke. The sight of smoke signify the presence of a fire. If energy, matter & Quantum information are indestructible so too is the concept of entropy. Any physical system (even a black body) must display a certain degree of entropy.

### **LAW OF CONSERVATION OF ENERGY**

The total amount of energy in existence does not change because energy cannot be created or destroyed. We may talk about needing energy, using it but in fact we can show that from one form to another, when this is done after the change as before. We call this the conversation of energy. (J, AVISON, world of physics). The universe consists of pure energy, matter or Quantum if one of these obeys one rule, all too do flow suit. The principle of conservation of energy is not an exception. The universe is thus of conservative body which caches these fundamentals applying Holography to ensure Quantum information, matter and Energy can be retrieved at any instant regardless of the time it was coded even when it encounters an event horizon (Beckenstein bound) a sort of firewall ensures, a sorting algorithm applied enables us to recover the data as it is indestructible.

### **MIRROR SYMMETRY, ACTION REACTION AND HOLOGRAPHY.**

The universe is fully symmetrical, symmetry means Balance. Newton third law states that for every action there must be an equal and opposite reaction. Newton was the first person to realize that forces always come in pairs and that a single force is an impossibility. (AVISON 1983, The world of physics). Cartesian mirror symmetry (balance) in a holographic model puts real as positive. A real object (divergent beam) gives rise to a virtual image, in the later a virtual object gives rise to a real image in each case the image object are equidistant from the mirror. Assuming the mirror position (say we live in a 'middle' world. The photon and graviton exist as their own antiparticle, mixing the two scenarios yields a Kaleidoscopic view varying relative to observer's view. Fermio-Bosonic symmetry is as such inevitable. If the

photon is a Fermion (force carrier of Electromagnetic force) then the graviton would hitch a piggyback ride as the Boson (particle). The reverse is also true.

### **GRAVITY MEETS ELECTROMAGNETISM IN A SCALAR FIELD**

If we live in either the real or virtual scenario. At any instant the photon & Gravitation must display this Fermio - Bosonic symmetry. The selection Bias largely due to the observer. For example in our world, Newtonian symmetry would apply. The photon symbolized by light whose tendencies are to travel outwards (from source) to balance the graviton symbolized by gravity which tend, to act on itself (towards source). Experiencing one side of the story due to our Biological limitation. The brain selects on its own Bias. The photon (light) is experienced as the Boson, we in turn experience the graviton (feel gravity) as the force Fermion.

An observer in another frame might observe the graviton as the boson and feel light as the 'fermion' force. This would portray why gravity is weak, our biological mind is able to perceive while maintaining symmetry. This leads us to conjure a parallel universe.

### **PARALLEL UNIVERSE NEXT**

If we live in the virtual (image) then the other end has the real (object) part of the symmetry. The reverse is also true. Quantum superposition allows the above scenarios to exist simultaneously. With our Biological resolution consciousness restricting us to one. We live in a situation as such. Chan paton factors would give rise to opposite charges (ionization in each of these two environments which in turn exist cosmically as Branes. This act as an exchange channel, energy, matter and information would cycle (intercycle) between these two branes. An existence in one Branes is Holographically preserved in the alternate. Anything coming into conscious form in one of these branes must be delivered from the opposite leaving behind a Hologram(virtual) copy when consciousness ceases. In the particular environment, as such is the physics on an M-Brane.

### **THE HILBERT SPACE**

The Hilbert space is the fundamental space in which Holonomic transformations can be done in Quantum fields. The Hilbert space is Isomorphic, global and its elements are well defined by the ratio  $\pi$  ( $\pi$ ). The Hilbert space is able to generate a plethora of product space whose physical diversity is descriptive of all scenarios in the universe.

## DEDICATION

This paper is exclusively dedicated to celebrate Nelson 'Madiba' Mandela. A great son of Africa who stands tall- strong as the Baobab tree in the African Savanna. Our African philosophy-Ubuntu (umundu), the care, compassion of having each other always at heart - existing beautifully as our ancestors lived. Before continental drift kicked in, all humanity lived together, we shared a grand supercontinent, the remnant of which still remains – Africa. The heart of the world. Though the continents have drifted the geographical jigsaw fit still persists. So too does a lot.

The old wise man always knew, we must share all we have in love truth and forgiveness bringing out the subtle beauty and diversity of our planet and hence the universe. Madiba went into struggle knowing very well the war had to be won but the victory-outright human dignity, had to be savoured by all. Freedom came and thus co-existence. The sun never set on such a warrior king as you Madiba. We will always keep you close. We must continue on with what you the vast intellectual riches you have left, no matter the hardships we can encounter, for the future depends on us. To make the world a better place for prosperity of all mankind and nature.

$$H=C=G=K=I$$

H-planck's constant  $6.634 \times 10^{-34}$  j/s.

G-  $6.672 \times 10^{-11}$  NM/Kq.

C= $3.0 \times 10^8$  m/s.

$\gamma = \infty$ .

Ls = string length.

Lp = plank length.

When  $\gamma = \infty$ , string length Ls is thus  $=Lp/r$ .

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### **GLOSSARY**

- i. M-Brane – Hypothetical surface, epithetically coined. The prefix M is that from the M as in Witten's M-Theory or string theory. The later Brane is from Brane cosmology. The M-brane is simply M-Theory on a Brane, giving M-theory an aesthetic appeal to cosmology hence derive the Hypothesized eleven dimensional universe in M- Theory.
- ii. TOE – Theory of everything.