THEORY OF EVERYTHING: THE HIGGS, CCC, GRAVITY, DARK ENERGY/ MATTER, RELATIVITY, STRING THEORY, QUANTUM THEORY, HUMAN EXISTENCE

Abed Peerally, Former Pro Vice Chancellor, University of Mauritius

Summary

The topics of Dark Matter and Dark Energy and of the Higgs phenomenon, are amongst the dramatic examples of the universe being to a large extent unknown. Reported in the late 1990's by S. Perlmutter, B. Schmidt and A. Riess, the Nobel Committee in awarding the Nobel Prize to them in 2011 said: Their "*findings have unveiled a universe that is to a large extent unknown to science*". That is still true today and is likely to be so for decades to come. These findings were based on the behaviour of the Type 1a Supernovae which, due to their consistent brightness, have developed the reputation of being reliable standard candles in cosmological research. Perlmutter, Schmidt and Riess found that these supernovae, as earlier workers for decades had observed, are dimmer than what expected, and they concluded that they must be accelerating faster than believed, in their motion. The work of Riess et al proposed that dark energy, must be a kind of energy that could have an anti-gravitational pull, thus explaining the strange behaviour of the Type 1a supernovae as they move away from us, into the infinite horizon of the universe. Now in the late second decade of the 21st century, no dark energy reality has been discovered at all, and the same applies to the dark matter hypothesis that came out of the work that was awarded the Nobel Prize 2011. It appears like there will perhaps never be any proof of the existence of dark matter and dark energy particles, for these are claimed to be unable to interact with normal matter and energy and not to have any radiation. This is a typical example of why perhaps a Theory of Everything is required to throw some light on the mysterious realities of existence, if possible. Actually explaining something that has no material or energy evidence of any kind, makes that something as impossible to explain as God. They do not interact with anything at all. However, if the Theory of Everything can explain how the universe originated, it might surely also provide evidence of whether dark matter and dark energy exist or not. This appears very tricky for they have been claimed as being totally invisible and insensitive to any kind of experimental set up.

The Higgs boson came out dramatically in the work of Higgs, Salam, Weinberg, Glashow and others, that found linkages between the weak force and the electromagnetic force. It is believed in relation to the Higgs boson, even if it is not true, that all particles should have zero mass. Several different eminent physicists thought of rather similar ways of explaining mass and its origin. Generally, it was felt that a new Field that was later called the Higgs Field, permeated the universe, and the property of mass was acquired when particles interacted with this field whose particle was named the Higgs boson, the simplest manifestation of the field. However many physicists believe the Higgs phenomenon and its particle discovered in 2012 should be a more elaborate mechanism, on which further work is ongoing, particularly at the LHC. The feeling is that the phenomenon of mass has not understood in its full reality.

It goes without saying that in the absence of a Theory of Everything, it is not possible to really know, as far as possible, the nature and fate of the universe, mainly because the universe was conceived on a deliberate master plan. The implication is that there could have existed only one such specific plan: the supernatural plan to create our universe, which to humans is the Theory of Everything as far as possible, capable to describe our universe. The fact humans are destined to discover the Theory of Everything, according to Kepler and Whewell, indicates there was supernatural creation of the universe, and therefore finding the Theory of Everything is an astounding perspective.

The scientific/philosophical Theory of Everything will be describes soon, is coming at a historical juncture where several well-known cosmologists are talking about natural creation from practically nothing or based solely on mathematics. Since most intellectuals and members of the public believe the universe had a supernatural creation, a scientific concept of the origin of the universe by a Supernatural Mind or God, would be of enormous interest. It will be the collision of the traditional imaginary Godless concepts of the origin of our universe with a scientific concept that creates an extraordinary historical event in our current intellectual, scientific, philosophical and theological world. Since the Theory of Everything will be really, as far as possible, a universal and metaphysical concept of the universe, it can produce an intellectual revolution in the scientific and philosophical sectors, that will impact on theology in ways not seen before. There whole world will benefit, for the total

confusion that surrounds the comprehension of the realities and origin of our universe would reach a turning point, never seen before. It will demonstrate the power of intellectual knowledge as the torch bearer of humanity. The reason is that intellectual ideas are capable to turn humanity into one collective mind in the universe.

The universe under GRT is expanding, and there was never been any tendency for the universe to contract and collapse into an unimaginable black hole. Penrose's hypothesis of a cosmic crunch and the rebirth of the universe (CCC), is not a possibility, because the uncertainly in science is at the quantum microscale, and not at the macro or universal scale. Gravity was correctly explained by Einstein. He referred to it as pseudo-force, causing the warping of space time, being perhaps a kind of variation of the electromagnetic force. The truth is that the nature of black holes happens to be as misunderstood as is the nature of the universe. Cosmology has been a precariously understood domain, the reason being the lack of adequate cosmological understanding of how the universe came into existence. This is not surprising, as I explain in my coming second book on the origin of the universe, for our world is, historically, at the beginning phase of its modern scientific era, being hardly one century old, if we take the golden age of physics of the first decades of the last century, as marking the beginning of our modern scientific culture.

No wonder we do not know the real nature of forces, particles, space, time, atoms, matter, gravitation, expansion of the universe, dark energy, dark matter, and the origin and fate of the universe, topics addressed in my second book due in late 2018. Our extraordinary universe must have been inspired by a scientifically precise and elaborate design. Gravity remains one of the greatest mysteries of science for it has no quantum particulate physical identity, its imagined particle, the graviton cannot exist, and up to now gravity can only be calculated and described, for instance in the equations of Newton and Einstein. It exists because it arises due to totally natural reasons, which were largely seen in Descartes' belief there must exist a law of the universal conservation of the quantity of motion. The quantum nature of spacetime, if it is not a particle, must have physical realities that are sensitive to acceleration, indicating that spacetime is perhaps fractal in its physical reality or at least mathematically, the reason why Einstein was very precise in his description of general and special relativity. String Theory, a great intellectual exercise, has the weakness of not explaining how exactly the strings acquire their

property of vibration. Any Theory of Everything must incontrovertibly explain the origin of motion and of gravitation. The physics of the universe are intimately fused with the philosophy of existence, not surprisingly, as the purpose of creation must have been for producing a conscious being, not solely the universe.

Introduction

The Big Bang is up to the present time, at least until the author's Theory of Everything is published, the only valid concept of the origin of the universe. The Big Bang showed that under Einstein's GR, the universe seems to be expanding and so at birth it could have been a speck of enormous energy, capable to give birth to the universe.

However, the real narrative of the universe is an extraordinary story, complicated and very revealing of the supernatural properties around our ultimate nature. Because we are still learning how to do science and to understand the world and the universe, we tend to dramatize concepts and ideas, especially if nobody can disprove much of what we claim. That is why a master concept, that puts some of the fundamental governing principles of existence in a nutshell, can be a valid step towards really understanding the how and why of our human existence, in a world, in the universe. The Theory of Everything impinges on practically all major aspects of the universe including human existence. In fact, everything about the universe and its realities are part of a meaningful integrated whole, whose ultimate nature and meaning can only be part of a supernatural act of creation. In this paper we will address aspects of gravity, space, dark matter and dark energy, and the integration of relativity with quantum theory, for they are among the big problems of science and will be dealt with in details in the book being published. Cosmological ideas like Conformal Cyclic Cosmology of Roger Penrose, dark matter, dark energy, antigravitation, and singularity are symptoms of a cosmological culture which, far from being philosophically wrong, might in fact be a reflection of what is the current scientific notion about the ultimate nature of existence, which has been given the image of a natural entity, unlike the Big Bang, which Fred Hoyle said openly invites the notion of divine creation. We are in reality a supernatural whole, and behind the universe and existence there was a super-concept based on metaphysics, which if properly understood, can lead us towards a new horizon of great cosmological discoveries. This paper is quite a brief one, meant to introduce ideas

that will be described in far greater details in the author's second book, scheduled for end 2018, hopefully.

Lemaitre's Big Bang

There was no real Big Bang as the initial event of the manner our universe originated, in the sense there was initially Lemaitre's Cosmic Ovum bearing the entire mass of the universe, which led to a gigantic very high energy explosion, from which the forces originated, followed by particles, mainly photons and quarks, and so on. There was, in fact no cosmic ovum of any kind, neither a singularity, for they are mathematical extrapolations, intellectually dramatic and interesting, but cosmologically outside the realm of reality. There was, however a huge creation event, described in the TOE, from which, in due time, particles, forces, atoms and molecules were produced to lead to dust, matter and galaxies, stars and solar systems.

As explained by the author in his exponential inflation paper, there existed an infinitely high energy condition, in the early stages of the origin of the universe, which the Lorentz equation shows. That condition occurred at a time when the enormous high temperatures and high-energy conditions caused space-time to be contracted, but *not* infinitely contracted. If there were a condition of infinite contraction, the universe would not have inflated, to start with, and there would not have been any formation of particles and forces. That initial universal birth condition was instantly followed by a period of rapid creation of forces and of particles in quick succession that produced the exponential inflationary epoch, at the start of creation, in an orderly manner. There was no uncertainty of any mishap, for there was no scientific reason why that should have been the case. There was not the slightest possibility the baby universe had any risk of total collapse, as the TOE will explain. Every event, as from the very beginning, occurred in an orderly preplanned fashion, a trend so well orchestrated that it would progress along only one pathway, that never changed and would not until the total disappearance of everything material. However, what the ultimate property of the remnants of the matter in the terminal stage of the dying universe will be like is, in our still early scientific and comparatively poor cosmic knowledge, a total mystery, which even a TOE might not be able to predict, unless decades and centuries follow up on the TOE, to reveal new knowledge. Scientific knowledge will come drop by drop, and any impatience can only create lots of science fiction.

One thing is clear: there can never be a state of nothingness, following the total collapse of the universe. However, philosophically and scientifically, the law of conservation of energy is possibly an infinite truth, in the sense there could be a metaphysical or supernatural law of conservation of existence, or even of consciousness, eternally. Our own world has laws of nature like Newton's mechanics, Einstein's relativity and quantum mechanics that cannot be ordinary realities for they are replete with supernatural values. They are impossible to fully understand, especially in our current period of history. Our responsibility to posterity, in science, is to study the realities of existence as impassionately as possible, in an integrated manner, patiently, to refine our knowledge of the Theory of Everything of the Universe, and to see how we can thereby communicate real science and philosophically to our posterity, who surely will judge our performance in their increasingly sophisticated ways, sooner or later.

Penrose's Conformal Cyclic Cosmology

The eminent mathematician and cosmologist Roger Penrose's well-known work on the quantum nature of consciousness, singularities, and the CCC is bound to impact on the progress of cosmology and physics. Under the CCC, he recently formulated an extension of his views of the creation of the universe, based on the possibility that our universe has remnants of blackholes that belonged to another universe, before ours. Thus, in the CCC the gist of the concept is the cyclical regeneration of universes, each of which will in due course produce the initials of a subsequent universe. Apart from the fact it is next to impossible to substantiate this hypothesis, the concept is an interesting philosophical and spiritual notion of existence, for if the universe regenerates itself, meaning it possesses a consciousness of regeneration, maybe human existence too could do so, as believed in some religious theories. As we know we are mortals. The Theory of Everything, being published in due course, will demonstrate that the origin of universes is a very thoughtful, elaborate and complicated mechanism, and whatever the merit of Penrose's cyclic universes, the TOE makes it clear it is impossible for the remnants of a previous universe to regenerate a universe like ours. This view has been wisely expressed in an analogy, by the famous atheist astrophysicist Fred Hoyle, who pointed out that the accidental creation of universes is as unlikely as the possibility a tornado sweeping across a junkyard would assemble a Boeing 747.

The Theory of Everything, in an elaborate discussion, substantiates that the creation of our universe, incontrovertibly, necessitates a metaphysical mechanism. However, the creation mechanism, far from being simplistic as the CCC, is so complicated, scientifically and metaphysically that universes cannot simply become defunct, regenerate, and so on and so forth, for then, our science and the Standard Model too would have been of a totally different nature. The rigidity in our laws of nature evidently shows that our universe has extraordinary qualities, which the atheist writer Ray Bradbury brings out in his immortal statement as follows:

"We are an impossibility in an impossible universe."

Gravitation

We know of Einstein's determination in the last three decades of his life to unify the electromagnetic force with gravitation, or with the gravitational field. Einstein's concept of space and gravity significantly evolved after he formulated the special relativity theory in 1905, and subsequently in his general relativity concept presented a decade later. There was a dramatic evolution of what gravity, acceleration and space meant to him. Initially he found space to be flat in his special relativity, which must be correct. He found space to be curved in his general relativity, which is also very correct. In special relativity, one is in an inertial frame of reference, in which Lorentz equation shows how the resulting relativistic effects accompanying acceleration/deceleration impact on space or space time linearly. That was why Lorentz predicted, and Einstein confirmed, that with acceleration, there arise changes to linear space length, and to time, with the corresponding changes to mass and energy.

In linear motion it is question of pseudo-force or gravitational changes due to kinetic energy, while in general relativity it is the issue of potential energy creating gravitational pull. The reality of acceleration, gravitation, and space and time, in causing relativistic effects, is fundamentally parallel in special and general relativity, which is logical and self explanatory. The mathematical models are simple in special relativity and complex in general relativity. The reason is due to the nature of space, which is flat in special relativity and curved in general relativity, although quite simple to picture mentally. Both space and time are mathematically linear in a 2-D flat surface in SR, and in a curved surface in GR. In the author's TOE, the space flatness in SR is visualisable

as the superposition of an infinite number of abstract quantum level flat spaces, while in GR, there is the superposition of an infinite number of abstract curved spacetime. In SR the ultimate structure of space is a flat construct of quantum geometrical forms that change linearly, in the direction of motion, in proportion with changes in the quanta of acceleration (or velocity). In fact, it is acceleration that impacts on the space construct in both SR and GR. The quantum nature of gravity is not a particle (graviton does not exist), in both SR and GR. It is merely the construct of space that gets modified, contracting or dilating, in both SR and GR, under acceleration. The energy affecting SR is kinetic and in GR it is potential. Both kinetic and potential energy are basically, with regards to their ultimate physical effects on gravitation or on modifying space, exactly identical, but mathematically and geometrically occurring in two different ways. However, as the author's publication of 2008 shows, there is a universal correspondence of 1:2 in the relativistic effects of SR to GR for objects in Keplerian orbits, since the space/time construct in SR is flat geometry, and curved geometry in Einstein's GR. However, the quantum construct of curved space, in GR, is possibly a superposition of curved quantum units of space, each one being, like for instance, the quantum size equivalent of the iris/pupil of the eye. The diameter of the pupil, in the analogy, corresponds to the amount of contraction or dilation of space, due to acceleration. The greater the gravity the more contracted is the fractal of space, or for the eye picture, the greater the pupil contracts with increasing light source. So, space is like a collection of iris/pupils, that contracts under gravitation, which in the case of the eye, contracts due to light intensity. These quanta fractals, when completely obliterated, whether in SR or GR, means that the acceleration/gravity is total, i.e. occurring at the equivalent of acceleration/gravity at the speed of light, in theory, at least. One can appreciate how impossible it is for the LHC's specialised accelerators to push particles to the speed of light for, in the analogy given above, the ultimate limit for the fractals of space to contract is zero, which is an impossibility, for the speed of light is practically impossible to attain, in laboratory experiments. As Roger Penrose says, there are structures, like singularities, whose mathematics are infinite. The only infinite physical reality we have in existence is natural light, whose speed is something of a contradiction in the context of the laws of nature. The photon tells us, in a manner of speaking, that it is what it is due to its space-time, which must be an incredible physical, or metaphysical, reality.

Finally, we need to again ask what could be the nature of gravity? As Einstein himself said, gravity is a pseudo-force, and gravity itself is not something physical, but an effect caused by a potential, for instance a pull or an acceleration. Gravity, as Einstein said, is in fact a pseudo-force, which can be felt by something accelerating, whether in the context of SR or GR. It is the backward pseudo-force you feel in an accelerating vehicle, due to SR and to the acceleration of the car, or to the pull of gravity in a fall, or as you walk downhill. Gravity is the pseudo-force that is created by acceleration, so that acceleration in one direction, is equal to the pseudo-force or gravity in the opposite direction. The proportionality of relativistic effects, in the author's 2008 SAJS paper, for say a satellite in a Keplerian orbit, is due to the fact there is a 1:2 proportionality between the relativistic effects due to linear motion (or acceleration) of the satellite and the effect of gravitation pull of the Earth on the same satellite. The reason why kinetic and potential energy, in Keplerian orbits, shows the well-known proportionality of 1:2, and why this correlation of gravity and acceleration in satellite relativistic effects exists, is fully discussed in this paper.

Dark energy and Dark matter

Dark matter and dark energy are two universally well known, and unbelievable realities of cosmology mainly because no one has physically observed or identified them, but also because some physicists and cosmologists are adamant they must exist, although there is no scientific study that can ever demonstrate they are physical realities. Considering the rather poor level of our knowledge of the fundamental nature of the realities of the universe and of existence, one can see that there would be mysterious issues or simply unknown issues about our ultimate nature. As a result, this section talks about various details, around the nature of gravity and of dark matter/dark energy, for they are related to gravity and antigravity. Under these circumstances, we need new concepts to attempt to fully explain nature. As Charles Taylor argues, reality can be a very elusive phenomenon, and the solution is to seek more and more refined "*understanding".* That is why perhaps a Theory of Everything is the kind of cosmological or scientific tool indispensable for our current period of scientific and intellectual development. A Theory of Everything in our current scientific era might be the only tool capable to understand the universe, and it might, if it exists, increasingly develop in the decades, centuries or millennia to come, due to the enormous progress science would subsequently be making.

It has been realised, since a century that the universe consists predominantly of three particles: protons, neutrons and electrons. The protons and electrons are the particles of matter, for they are the positively and negatively charged particles, which when coexisting in say an atom of hydrogen, make the atom neutral. So, in principle all atoms must be neutral. This scientific reality is amazing for everything material has the same basic particles, and there must be an extraordinary explanation why our physical realities should be like this. Fundamentally, every bit of matter, is identical with one another, in terms of neutrality, indicating that neutrality is a fundamental reality, perhaps having interpretations we are not yet aware of.

Protons and electrons are bound together by the electromagnetic force, which is so powerful that the cohesion between oppositely charged particles is what is behind the solid structure we see in existence, like our own bodies and wood, bones, rocks, metals and everything that is solid. The electromagnetic force in atoms and molecules causes our ultimately flimsy physical realities, the wave packets in electrons and protons, to acquire an apparently solid nature, that is unbelievable, when you realise that the completely solid stuff we all are, is ultimately bundles of waves. In fact, there is no real solidity in anything that exists, since for instance a hydrogen atom is over 99.9999999999996 % just empty space. Some minds might even speculate that the soul, if it exists, would be a packet of pure waves, which physics tells us is what our human body also is, particularly considering the fact we do have the property of consciousness, a phenomenon that science is still trying to elucidate. Now if you wonder about the ultimate nature of forces: that is even more surprising, for they are pure waves, something that cannot be directly viewed, such as looking at water waves, for instance. Therefore, the whole universe is an impossible entity, of incredible size and nature, made up entirely of energy, which is of wave nature. At this point it is fascinating to simply ponder on the following remark made by the Jesuit paleontologist Teilhard de Chardin: *"Surely we are not human beings having a spiritual experience, but spiritual beings having a human experience."*

Some readers will perhaps notice, as I said earlier, that gravity is not a tangible physical reality like atoms and marbles. Gravity, Einstein said,

is a pseudo-force, perhaps a physical expression of the electromagnetic force or energy, and in recent decades gravity has turned into a much more dramatic feature of the universe. The reality of dark matter/dark energy, linked to the reality of gravity, has become one of the most sensational aspects of physics and cosmology, producing numerous scientific papers every year.

The physicists, astrophysicists and cosmologists of the last century believed that the universe is make up of electrons and protons, and no one ever felt, seriously, that that could be a very wrong perception of what the universe could be. It seemed to most physicists that electrons and protons, with neutrons, very much did sound like a good recipe for constituting the matter of the universe. Abruptly, a certain perception of how the neutron stars seemed to behave, and the mathematics of the expansion rate of the universe, based on certain viewpoints, has created an intellectual commotion that has been gathering an awful lot of momentum, with the result that our traditional belief that visible matter of the universe represents 100% the total matter of our universe, has now dwindled to a mere 4%. The supposed 4% matter that we know is still the source of most of the research conducted in the world and probably in the whole universe. The 96% of invisible dark energy/matter is the subject of huge research efforts by various groups of physicists, a research effort viewed as very challenging and a top priority at the planetary scale, demanding a lot of investments around the world.

The race to solve it has produced a few false alarms. Naturally, science must concert to elucidate the dark matter/dark energy mystery of our world. However, an ultimate Theory of Everything, could very possibly explain whether dark matter and dark energy really exists. Discovering the Theory of Everything must be something many physicists would welcome, for it could explain the mystery of dark matter/dark energy. Some reputed scientists have been insinuating, since the early decades of the 20th century, that the strange behaviour of some galaxies and stars, intimately connected with neutron stars, is such that it is impossible to explain their rates of motion, without new physics. Subsequently other eminent groups of workers made critical studies of galaxies and neutron stars and found their rotations to have unbelievable features, that could not be explained by any known physical laws. The whole topic of dark matter/dark energy blew up when reputed scientists went as far as to confidently propose that dark energy could behind the acceleration of galaxies and neutron stars.

Dark energy was predicted to produce an antigravitation that accelerated the expansion of the universe. Dark matter is believed to make stars and galaxies rotate much faster than what calculations of their masses would dictate, and their excessive speeds have therefore been attributed to a new but invisible matter, dark matter, because it is apparently invisible. Thousands of papers have been published on these topics and we are not even an inch nearer to finding the answers. It has even been speculated that there could be different kinds of gravity, the ones governing our worlds being different from the large-scale gravity operating at the macro scale of the universe. Dark energy is believed to be a repulsive force that is generating quantum fluctuations in empty space, a force that seems to grow stronger, with the expansion of the universe. These extraordinary views by seasoned physicists do indicate a huge mystery, and one can suspect that their studies have perhaps been speculative, but they have influenced thousands of the younger physicists, thereby creating a maze of speculative research.

The belief that dark matter creates huge gravitational fields, while dark energy produces anti-gravitation that increases the rate of expansion of the universe sounds attractive and convincing enough. Increasingly more sophisticated installations, all over the world, are naturally contemplated, by both public and private bodies, to get to the bottom of what these mysterious phenomena are. The fact a Theory of Everything seems to be coming, is perhaps a happy coincidence, and in fact it may be coming at the right time, for it could show that most probably dark matter and dark energy, as numerous physicists think, might exist or not.

The dark matter dark energy problematic is not surprising for physicists work with the most difficult natural phenomena in the universe, which include things that result from the manner of the origin of the universe, perhaps, arising from the supernatural. It is very possible that the creation of the universe required a higher science, called metaphysics, that is quite impossible to figure out, but which did lead to the supernatural creation of our realities and existence. All attempts to regard our universe to have arisen accidentally or otherwise naturally, will sensibly obstruct the march of science, for humanity seriously requires science to be exactly what it is meant to be. Our current period of scientific development, overall, does seriously require a Theory of Everything of the universe and of existence, even from the point of view of the social sciences, as the monumental book of Charles Taylor, *"A*

Secular Age" attempts to suggest, for the universe is both physical and philosophical.

In fact, whatever be the ultimate nature of the universe, we can see that it is a steady state mechanism that can ensure the stable future of the universe, as it has been in the last 13.8 billion years.

The Higgs phenomenon

Not much is known about the Higgs phenomenon and of the manner the property of mass is generated, and it is very likely that the current views, based on the Higgs phenomenon and the gluey nature of the Higgs field and boson are seriously incomplete or over simplistic, and that the forces and particularly the Weak interaction may be incomplete concepts. The Theory of Everything being proposed in the author's coming book will also deal with this elusive topic and will show that the Higgs phenomenon could cover a much wider scheme of scientific realities. All together the physics of the universe could be far from understood and the views of many physicists about the Standard Model and the physics of forces and of particles having possibly a lot more to divulge, are perhaps correct.

Einstein's Relativity and Quantum Theory

It is realised that integrating the two primary laws of nature, Einstein's relativity theories with quantum theory, could reveal the secrets behind the ultimate nature of the universe, philosophically and scientifically, but there is no formula that tells us how to have their most effective integration into super concepts of the universe. Newton achieved his eminence by turning the force of gravity into a mathematical phenomenon by relating it to mass, in remarkable ways. Einstein's used the mathematical equation of Lorentz to turn his special relativity theory into universal metaphysical and scientific phenomena, which show that it is impossible for any object to move at the speed of light, for that will require infinite energies, a reality which is not scientifically meaningful. For instance, that would make it possible, as the talk goes, you would live eternally, without ageing if you travel at the speed of light. Einstein's general relativity concerns the complex issue of sorting out how cosmologically gravity functions in situations where objects move under gravitational pull on planets like earth and generally in the macroscale of the universe. Cosmological motions require a source of gravitational pull; usually that comes from cosmic bodies like galaxies, neutron stars, black holes, suns, planets which are so massive, that they

have gravitational pull that can vary form weak forces to unimaginably huge forces, as with black holes, and neutron stars and suns. In spite of the work of Newton, Einstein, Hawking, Penrose and a whole range of eminent physicists, nobody knows what exactly the force of gravity is. In fact, gravity, is correctly not included in the Standard Model of Particles and Forces, unlike the electromagnetic force, the weak and strong forces, in all of which there are specialised particles that are constructed to have the capacity to attract, repel or exert influence in deliberate and predictable ways. Meaningfully, the Standard Model of Particles and Forces, does not comprise gravity within its ambit, for good reasons, but that has not deterred large numbers of researchers to engage in mathematical concepts of gravity as a force, which it is not really. It certainly is evident that gravity does meet most descriptions of forces, although it does not have the specific particulate quantum explanations associated with quantum realities, that some physics concepts are attempting to elucidate, quite naturally.

It is possible that the universe may not be a totally a materialist entity, for it has features that appear to be mysterious, although in the Theory of Everything described in the author's coming book, gravity is shown to be something that has no physical reality in terms of waves and particles. The Nobel prizes recently awarded for gravitational waves discoveries, did not concern what the ultimate nature of gravitation might be. Gravitational waves are disturbances in the fabric of space, due to intense gravitational attraction. The waves in the Ligo experiments, were in a manner of speaking, gravity waves, for they were disturbances in space due to intense gravitational ripples, which however are made up entirely of *"electromagnetic energy"*. Therefore, they consist of electromagnetic energy, and the various pictures of the Ligo waves are pictures of electromagnetic phenomena, associated with, gravitational pull, potential energy and kinetic energy. This conclusion is supported by the author's 2008 article published in the South African Journal of Science. The data published showed that, in Keplerian orbits, relativistic effects due to special relativity and to general relativity are governed by a proportionality of 1:2, which is not strange. The 1:2 relationship also exists between kinetic energy and potential energy of the moving satellites.

Therefore, the conclusion about the nature of gravitation is that it is a disturbance of space fabric, whereby gravitational effect and kinetic energy and potential energy have the natural capacity to cause ripples in space, and this happens even as you walk around your office or in the

town. Everything that moves disturbs the fabric of space, irrespective of where that occurs, and irrespective of what is it that moves, from the slightest motion to the highest. So, you can see that anything which moves needs a cause to move, that will have to be a real physical force, that carries kinetic or potential energy. When Descartes was inspired to declare there is a universal law of the conservation of motion, he must have been inspired by an ingenious brain-wave of inspiration, for he in fact discovered there was a law of motion, throughout the universe, that had to obey the universal law of conservation of energy. The proportionality of relativistic effects in Keplerian orbits shows that you maintain your orbital freefalling trajectory due to the combined effects of relativistic motion and centrifugal/centripetal forces, all in combination. Without the natural pseudo-force of nature, nothing moves. String theories should attempt to insert in their mathematics some additional ideas about gravitation, without bringing in the graviton, for gravitation does not have a particulate nature.

The whole dynamics of planetary and cosmic bodies in orbital trajectories throughout the universe is a naturally sustainable universal system of motions. Within that universal reality of cosmic dynamics, gravity is a pivotal actor, and one can gather why it is a phenomenon that has no particulate nature. Gravity occurs throughout the universe without hassle and obstruction, due to the natural phenomenon of centripetal and centrifugal fictitious forces, precisely of natural occurrence meant, as Descartes noted, to produce the notion of the existence of a cosmic order based on the conservation of the universal quantity of motion.

The overall conclusion regarding gravitation, centripetal and centrifugal pseudo-forces, is that there is gravitation, for where there is energy/mass there is acceleration, and their interaction produces a pseudo-force proportional to the mass of the concerned massive bodies. It is not difficult to see the reason why gravitation is proportional to mass and gravity in the inverse/square equation, which also applies to electric, light, sound, magnetic and radiation. The inverse square equation shows that space is a kind of physical fabric, a real physical medium or aether and should be an important reality and component of existence and of the universe, which hides complicated deep secrets, that would perhaps be understood in the decades and centuries to come. That could be important for understanding consciousness, for instance, and the metaphysical aspects of existence, about which a Theory of Everything cannot effectively intervene in our

current state of knowledge. The ultimate reality might well be an issue of energy and dimensions, motion, acceleration, speed in which consciousness is the ultimate reality, whether in physics or metaphysics, whether in the universe or the beyond.

Conclusion

It is likely that the Golden Age of Physics, of the early 20th century has not yet been emulated. We might however be at moving towards a new Golden Age of Physics and of Science. The ultimate Theory of Everything is a master concept of the basic nature of the universe, that tells us what the original creation plan was, based on which the universe was conceived. However, formulating the Theory of Everything, from current cosmological knowledge has been generally seen as nearly impossible, for several basic realities of existence have been inadequately described. One gets the impression the universe could have been more comprehensively appreciated if only we had historically been analysing its realities in a holistic approach, by attempting to associate physical explanations with philosophical interpretations. Whatever we have achieved in the formulation of first universal Theory of Everything, to be published soon, is a critical stepping stone, that can stimulate further research and explanations about the how and why of existence.

It is not possible to have an Ultimate Theory of Everything for a universe that is described as having either accidental or natural causes. That is due to the simple reasoning that there must have been a supernatural metaphysical mechanism capable of creation in which there are explanations that humans can understand. There is a theoretical and philosophical compulsion to have to explain from where the original cause for existence arose, and why and how. Where there is metaphysics in the creation of a universe, there will be science in that universe. Universes which, in theory, arise by accident impose serious intellectual limitations on the capacity of humans to ponder about the scientific parameters as well as the philosophical ones, that make sense in an integrated approach.

The fact we can produce a credible Theory of Everything in our world, from knowledge we have produced over the last twelve decades, in which supernatural creation was not ignored generally, is a strong signal there was a metaphysics behind existence and our universe. Inventing origin of universes mechanisms based on mathematics, to produce the

physics of the origin of our universe can be a hugely problematic exercise, for you leave yourself to the whims and fancies of writers, most of whom have far too much of a materialist approach. The possibility of being able to associate philosophy with science is an important indicator that there was a metaphysical plan for creation, one that could only produce our universe, for any variations in the various aspects of the creation mechanism could not have led to a viable universe. The mathematical constants that occur in our laws of nature would not be what they are if there were variations in the manner the metaphysics that initiated our universe was even a little bit different, so as for instance to produce a range of universes, as believed under the Anthropic Principle.

The Theory of Everything of Science and Cosmology, based on science and philosophy, can lead to significant new perceptions of the universe and to a reformulation of the Standard Model of Forces and Particles, and to dramatic advances in the manner we understand physical realities. The concepts of nature will evolve are likely to evolve in leaps and are likely to have new philosophical interpretations of existence.

Related publications by the author

Peerally, A. (2008). A law of time dilation proportionality in Keplerian orbits. *South African Journal of Science*, 104, 221-224. Reproduced in vixra: Relativity and Cosmology: **viXra:1710.0087**

Peerally, A. (2009). Astronomy and the ultimate culture: Elucidating the origin of the universe will spell the integration of science, philosophy and religion. Relativity and Cosmology: **viXra:1710.0085**

Peerally, A. (2013). Relativistic particles dynamics and entropy produced the exponential inflationary epoch. vixra: Relativity and Cosmology: **viXra:1309.0152**

Peerally, A. (2016). Theory of Everything = Philosophy of Everything + Physics of Everything. Part 1(22 pages). Vixra: Relativity and Cosmology: **viXra:1709.0071.**

Peerally, A. (2017a). Theory of Everything = Philosophy of Everything + Physics of Everything. Part 2 (21 pages). vixra: Relativity and Cosmology: **viXra:1605.0239**

Peerally, A. (2017a). Theory of Everything = Philosophy of Everything + Physics of Everything. Part 3 (29 pages). vixra: Relativity and Cosmology: **viXra:1605.0211**

Peerally, A. (2016). Poster: Consciousness and the theory of everything of the universe. Poster Exhibit: The Science of Consciousness Conference, Tucson, Arizona.
Peerally, A. (2017). Poster: Towards elucidating the nature and origin of consciousness. The Science of Consciousness Conference, Tucson, Arizona.
Peerally, A. (2017b). In Search of Consciousness and the Theory of Everything. Book, 474 pages. Printed in the US by Ingramspark.

ISBN

INGRAM SPARK:

978-0-99517-496-2

978-1-77302-480-6

978-1-77302-246-8

978-0-99517-495-5

978-0-99517-490-0

AMAZON
978-1-977501-769 (Black and white; soft-cover: CreateSpace)

00000000000