

Third Paper:  
Essay on

**Physicists as Lay Theologians:  
Physics at the Theological Frontiers  
*And vise-versa***

by  
Neil Kazen

towards  
Course # TRH2455H S  
“Orthodox Pastoralia 2”  
July 21, 2014

**Introduction:**

Life has never the same since the Christian Titanic hit the iceberg of nihilistic science. The chock threw many of its people off the deck instantly. And with gaping holes in its hull, questioning the very existence of God; and the very foundation of all what Christianity stands on and for, it listed so badly that most of the rest slipped off board into the raging waters. The lucky of them huddled on the dingy lifeboats of New Age “spirituality”, tossed around by the waves of insecurity. The not so lucky had to brave the frigid waters of full-fledged atheism that sucked the life out of them. The few who were still on the ship, the die-hard Christians, barricaded themselves in their airtight chambers in a desperate hope for survival regardless of what happens next. Little they knew, once the merciless ocean claims their ship, they will be crushed hard by the heavy weight of reality ... die-hard indeed.

While the tragedy is unfolding, Reformers are busy shuffling furniture on board as if that would reverse the listing. They don't seem to be aware of the holes in the hull; either they didn't bother looking over the edge or they were too blind to see. At least they saw the incline while the Performers, of traditional rituals, aren't aware even of that. Watching the Reformers and Performers bumping with each other on that slippery sloped deck would have been entertaining if it wasn't so sad.

Luckily, unlike the other Titanic, this one has unexpected help: Brave divers with effective tools are busy bridging the gaps. In their dedication to save the ship, they didn't bother taking permission of its Officers. After all, it was those “in charge” who steered it on that fatal course. Reciprocally the Officers are not aware of the silent salvage, currently underway by the Divers, since they don't even bother peaking over the edge.

Hopefully, this fledgling rehabilitation, will advance far enough to save the vessel; at least keeping it afloat. Some listing will persist; that is when the Reformers shuffling will bear fruit and the Performers will continue their traditional show.

There are at least two ways in which these scientists use Modern Physics to support Faith: First they utilize the uncertainty of Quantum Physics as a window opportunity for the Faith; and they count on the inability of the universe to survive on its own, as a call for the presence of God. With that they help in the removal of major hurdles facing Faith. Second, they show parallels between their science and Theology, i.e. icons of God embedded in scientific discoveries.

With The list if such scientists is growing with the deepening of scientific probing into the cosmos. Attached is a flier of a science symposium, presented by four prominent physicists on “String Theory and the Multiverse: Philosophical and Theological Implications” <sup>(1)</sup>. Of these four, I chose Robert Mann for Part I of this paper as an example of dialogue between science and theology. At first, it was supposed to be the whole essay, as a journal; but later I came across other ideas that could fit within the same framework of theology-science, which I presented as Part II. It is about harmony/ dialogue, between theology and science (including life sciences) in a mystical/ rational integration.

## **Part I**

### **Physics at the Theological Frontiers <sup>(2)</sup>, by R. B. Mann:**

Dr. Robert B. Mann is professor physics at the University of Waterloo and former president of both the Canadian Association of Physicists (CAP) and the Canadian Scientific and Christian Affiliation (CSCA). In his paper “Physics at the Theological Frontiers” (copy is attached) he presented an intriguing description of the latest developments in physics along with insights and challenges that they may raise for Christian faith. In my selection of his topics, I rearranged their sequence taking theological priorities into consideration.

R. B. Mann starts from purely scientific viewpoint; he is careful not to sound like a theologian bending science to fit his beliefs. Instead, he takes a big-picture perspective of science, trying to make sense of data so huge that, quite often, misses the underlining meaning.

Perhaps the most representative concept of new science is that of Quantization, which R. Mann uses with abundance; but he doesn’t stop there; he takes notice of other sciences reaching similar conclusions. He observes that both science and theology confronted similar issues with similar challenges, and sometimes, paradoxes. Both can benefit from a dialogue between the two.

By raising more questions than giving answers, he hopes that will draw the attention of scientists to think about the implications of recent scientific developments for the Christian faith.

He identifies five major points of interface, between science and theology, that have been affected by recent scientific developments: typicality, plurality, reduction, quantization and eternity. The order of these five topics is directed more towards building a gradually increasing interest, among his scientific readers, than to preaching by placing the high-impact topic first. That is not the order I would like to present in a theological paper with a clear preaching intent. For that reason, I took the liberty of the last one first (eternity) then quantization, reduction, typicality and plurality (the last two needed to maintain the order that he used):

#### **Eternity <sup>(2, pp.16-23):</sup>**

##### Plank’s Time:

R. Mann’s view the concept of eternity through an over-all reflection on the subject of “time”. He compares its complexity within both theology and physics in the hope of stimulating a dialogue between the two. But I would rather start with the opposite end of eternity: The question of shortest possible time interval. Is there such an interval? Or can time be infinitesimally small with ever-shortening length?

It is a problem the potential of which was simmering early in the twentieth century. It was ignored for the havoc it might wreck on science as it would expose the impossibility of fitting its two major theories together: The General Theory of Relativity of gravity, describing the cosmos at large; with Quantum Mechanics describing the subatomic world <sup>(2, p.16)</sup>. The former describes the world as a continuum, while the second describes it as discrete quantum leaps. Scientists had an uneasy feeling about it but they managed to use each theory successfully within its sphere

of application. It was a practical approach to what looked like a schizophrenic universe. The moment of truth arrived when the two had to meet each other at regions of the universe that are both of cosmic-scale mass, yet with subatomic dimensions: Black holes and, prior to that, the Big Bang. Gravitational force increases so rapidly with decreasing dimensions that any attempt to measure a distance less than  $10 \times 10^{-35}$  meter (ten to power  $-35$ , or one over a hundred billion trillion trillion) of a meter (also called Plank's dimension), will create gravitational force so powerful that it will collapse into a black hole destroying the device. The corresponding time interval of light trying to cross that distance is in the order of magnitude of  $10 \times 10^{-43}$  seconds (called Plank's time). Any clock that will attempt to measure such an interval of time will collapse into a black hole too (2, p.20). That interval of time can't exist in this universe, even in principle. If the universe can only be observed with quantum leaps of time, like in snap shots, what happens in between these gaps? What sustains the universe while its existence is constantly being interrupted? R. Mann concludes that means a moment-by-moment dependence on the Creator. Not only the universe needed a Creator, but needed the constant sustenance by the Creator as well. *Other scientists might resist such a conclusion leap, but then they would have to assume that our universe is a projection of some higher-dimensional entity where continuity is sustained. In that case, I would look for characteristics of that entity that would point towards a Creator. The path will just be longer. (Italics are mine)*

#### The Arrow of Time: (2, pp. 20-22)

The directionality of time, that time seems to flow in one direction, might not look like a big issue; but it's a mystery for science. The laws of both Newtonian (*and Relativistic*) physics are neutral to the direction of time. They remain unchanged if time was running in reverse. *Take the equations describing a falling and crashing glass, reverse the direction of time and you get a description of glass pieces assembling themselves into a whole glass. Yet no such an event has ever been observed.*

R. Mann refers to seven arrows of time that have been identified by physicists:

- Cosmological: The universe is constantly expanding with no sign of contraction.
- Thermodynamic: Entropy (disorder) always increases, never decreases (*perfume in an open bottle will spread around; the perfume around will not condense itself into the bottle*)
- Radiative: Sound, light and heat always spreads out, never concentrate in.
- Gravitational: Black holes absorb all forms of matter but emit only very limited kind of radiation.
- Metrological: Once a quantum system is changed because of being observed, it will never go back to its original state
- Subatomic: Certain subatomic particles disintegrate slower than their corresponding antiparticles.
- Psychological: Remembering the past and anticipating the future; never remembering the future and anticipating the past.

The above contradicts the time-neutrality of Newtonian (*and Relativistic*) Mechanics; but it is in perfect harmony with the Faith in ultimate purpose that is irreversible. From the Alpha to the Omega, our purpose is charted by God. Each "individual" (*Mann's terminology*) is called according to his purpose (Ro. 8:28).

R. Mann goes further into connecting the above to God's cosmic purpose of love (2, p.21). I think we need to add more links, to the above chain of arguments, before we can conclude that purpose is necessarily that of love.

#### **Quantization:** (2, pp.13-16)

R. Mann focuses on one outcome of Quantum Mechanics:

#### "Entanglement"

Entanglement describes connectedness, between elementary particles, that defy explanation. *For example, to*

*electrons on one atomic shell can't spin in the same direction: one has "clockwise" intrinsic-spin while the other has "counter-clockwise" intrinsic-spin. If one of them is flipped, so that it reverses its spin, then the other will reverse its spin instantaneously. This is called "Pauli exclusion principle" (3, p.11). It just states an empirical fact that has no explanation by any of the known forces of nature. The two electrons are mysteriously "entangled". In this case, the entanglement takes an exclusion form.*

Mann chose another entanglement: Polarized photons (2, p.14). If two photons, originating from the same source are entangled (spined in the same direction), then they will remain entangled even if they were later separated by a large distance. If one of them changed the direction of its spin, the other will do the same instantaneously. That puzzled Albert Einstein who refused to believe that there could be instantaneous transmission of information, even in principle. A verification experiment was performed and Einstein lost the challenge. Entanglement between far-away particles is a fact. It can be used to transmit instantaneous information in totally secured ways, it can be used in quantum computing, and it can offer a parable for theology concerned about connectedness-in-separation.

Entanglement in quantum physics offers invaluable support to our understanding of the Holy Trinity:

The three persons of the Holy Trinity are connected while separate. The Holy Trinity is not just three faces of one God (otherwise, how can we explain the baptism of Jesus); nor it is a committee of three gods. It is three separate persons entangled in infinite love (4). Many heretical ideas can be swept aside by inspiration from quantum entanglement.

#### Duality:

Another quantization outcome, listed by Mann, is the duality of wave/particle that he called: "schizophrenic" (2, p. 13). *Every particle in the universe is also a wave. And the waves of light are also particles. Each is perfectly a particle and perfectly a wave.* While he did not pursue its theological correlation, it is not difficult to see it as a model describing two natures of one entity. I feel that makes it easier to see the two natures of Christ in His one person.

#### **Reduction:** (2, pp. 10-12)

The main purpose of scientific thought is reduction: The belief that disparate phenomena are connected at a deeper level that can be understood through science (1. p.10). Scientists hoped that such understanding could be reduced to concise mathematical equations that unify our understanding of all phenomena. There has been some success in this regard: Newtonian Mechanics unifying earthly with celestial observations; Maxwellian Electrodynamics, unifying electricity and magnetism; four decades ago, electromagnetism was unified with the "weak force" governing radioactivity into "electroweak" theory; then currently attempts are made to unify electroweak force with "strong force" (nuclear force); and finally, "string theory" is trying to unify all of them with the gravitation.

This constant reduction is seen by none-theists as a steady closing off any large gaps that believers can use as evidence for the existence of God. In a leap of faith those unfaithful believe that all mysteries will disappear leaving room for any belief in God.

R. B. Mann examined the record of science as a reality check on the assumptions of none-theists. The results don't seem to support their claims; there are too many ad-hock facts that defy explanation. *The percentage of what is scientifically understood compared to what is observed did not increase; probably, it has decreased.* He gives the following examples:

- The "Standard Model" of physics, depends on 27 parameters, each of which has to be determined empirically with no deeper principle explaining their values. *Just ad-hock facts.*
- Further, the Standard Model matter seems to correspond to only 5% of observed mass-energy of the cosmos. "Dark Matter", that does not interact with electromagnetism (and therefore can't be detected by our

telescopes) makes 23% of the cosmic mass-energy. The remaining 72% of the mass-energy of the cosmos is made of “Dark Energy”, a totally mysterious entity that causes the universe to accelerate in its expansion.

- The mathematical equations used in Standard Model (*and more so in String Theory*) are so complicated and even intelligible that they defy the original purpose of science: Reduction

To sum it up:

Our science corresponds only to 5% of the mass-energy of the universe. The rest is fundamentally beyond the possibility of observation. Our understanding of that 5% relies on 27 ad-hock parameters that have no underlying unification that we know off. Further, the equations that describe the little that we know, are anything but concise or elegant. The claims of none-theists are unfounded. There is ample room for believing in God.

### **Typicality and Plurality:** (2, pp. 2-9)

This is a delicate issue that poses a challenge to theology-science dialogue: A “privileged” location for humanity at the centre of the universe vs. a typical location in a plural universe.

The notion that humanity was privileged by God, from Genesis to incarnation of Christ, seemed to be consistent with the Ptolemaic system that visualized Earth at the centre of the universe. No wonder that when Nicolaus Copernicus proposed his theory that the earth rotates around the sun the Church reacted with alarm. The earth has been demoted to a mundane location around the sun like any other typical planet. That was regarded as a demotion of humanity and undermining of Christian theology.

Further “demotions” continued as the solar sun was found to be just a typical star out of billions of stars, at a very humble location of our galaxy, which is just a typical galaxy out of billions of galaxies in our universe. It turns out that even our universe is just one out of infinite number of universes (Multiverse theory). Out of those universes there is at least  $10^{500}$  (one with 500 zeros to its right) of universes that might support life (low energy universes). That means that there are many worlds identical to ours, with possibly many duplicates of each one of us. If that is true, how does our theology deal with that?

On the other hand, the requirements for a life-supporting universe are extremely tight: a small change in dark energy resulting in change in the expansion rate of the universe, or a slight change in the mass of the proton, results in a universe inhospitable to life. *Furthermore, even if the cosmic parameters were not in conflict with life, other local parameters can present an obstacle to emergence of life: If ionized belts around the earth were different, harmful cosmic rays could have zapped life; if it wasn't for the accidental bombardment of earth by water-carrying objects there wouldn't have been water on earth (it was a puzzle trying to explain how did the earth retain water while it was a hot sphere of lava), etc.* So, the availability of other life-supporting planets is not exactly a done deal. There is a tension in science between typicality and uniqueness.

Similarly, there is “a dynamic tension in Christian theology between typicality and uniqueness”. Typicality, as Jesus reminds us that the sun rises on the evil and on the good, and rains on the righteous and on the unrighteous (Mat. 5:45); and uniqueness as our loving Father counts the hairs on our heads (Mat. 10:31).

Here, R. B. Mann tries to diffuse the conflict between theology and science on the issue of uniqueness vs. typicality by showing that both have a tension along that fault-line. While I would agree with him in-principle, I don't think that the current scientific environment is ready to accept that the two have the same degree of tension. In science, there is currently very little support to any concept of uniqueness; it is predominantly a typicality within a huge plurality. In theology, the human spirit remains unique with the typicality reserved for very broad outlines such as the rising of the sun or falling of the rain.

*While it is very hard to defend uniqueness in a deterministic science framework, it is a different matter when*

*science is not as deterministic as it looks. Apophatic holes revealed in quantum science (including life sciences) offers channels for uniqueness of the person and windows for the Faith to come in. That is what I hope to show in Part II of this essay.*

.....

## **Part II**

### **Synthesis of Theology with Quantum Science, my reflections.**

The above was intended to be the full extent of this essay as what was supposed to be a journal; but unexpectedly, new Light experience made it mandatory for me to work on Quantum Physics connection with Theology. Also, coincidentally, it extended to Quantum applications in brain science, DNA, evolution and botany. With no end in sight I had to cut it off at this point, limiting it to physics, as was originally intended, with hints of other sciences connectivity with Theology which will be topics for future essays.

For the past several months, the Light experience was intertwined with studying and reflecting on Quantum Physics, presenting me with the dilemma of how to present it: Writing it chronologically would be confusing to the reader, as the flow of both lines would be constantly switching from one to the other, interrupting both of them; while listing them separately would result in long stretches of seemingly two unrelated topics. Rejecting the former as an impossibility, I settled on the latter with hints of connectivity to the other line. In the end, both were fused together in a closing prayer.

#### **The Motivation and Guide: Light experience:**

The lesson I learned from my loss of the True Light, on Aug. 12, 2013, was that it should have never been approached lightly, but with reverence and fear. "The fear of the Lord is the beginning of knowledge" (Pr. 1:7). So, in my prayers for the return of the True Light, I vowed not to miss any of it should it return: Keeping a diary of even the slightest hint of it, whether it made sense to me or not; after all who am I to judge it? Should I fail to understand it, that would be my problem not the Light's problem; I should pray for understanding it rather than throwing it away. But whether I ever understood it or not, it should stay in my diary.

The following is my Light diary since I made that vow:

#### **Light of Hope:**

Shortly after grieving the loss of True Light, and vowing to do every thing possible to regain it, I was given hope, on Aug. 17, by whitish-yellow-green light like the rising sun. It wasn't strong enough to spoil me again, but it was just barely sufficient to be a ray of hope. For the next two weeks, I kept praying for the return of the Light, going through all possible soul searching while emphatically stressing my vows that no sacrifice will be too big to regain a sight of it. Then a chain of light visions started to appear: none was strong enough to spoil me again, but were just clear enough to imply the presence of some message. The shapes and colors gave a feeling of some mysterious meaning that kept me preoccupied in trying to decipher their meanings.

#### **Mystery Lights:**

On Sept. 3, I saw beads of violet, red and green lights filling a shape that looked like a triangle turned upside-down, with the base on top and the sides lightly curved <sup>\*</sup>(a crest-shaped shield of lights will be sketched and added). Was that the light of the Holy Trinity? I wondered. If that was the case, then it would support the filioque! Could the filioque be right and our Church be wrong all the way along? No, the last time I saw the True Light, was a flash from an upright triangle (immerging form the intersecting corners of two half-circles that were emitting defused light of two different kinds). Even though the True Light will not appear in the same shape twice, it will never contradict itself. Besides, the curved sidelines don't fit with the Trinity shape. Another mystery was the multi-colors: What would all

those colors mean: Do they represent some sins deforming the True Light into color lights? Why are they in dots?

With so many unknowns, I just recorded it as was with the hope of understand it one day. That day came on Dec. 13. It was a response to a challenge at the Theology class on Dec. 2 that resulted in widening my Quantum mechanics research to include life sciences.

One particular light of the above, the violet light, was puzzling as it was that light that was appearing repeatedly for many years (probably 7 or 8 years) without me having a clue of what it was. It was that violet light that finally it faded away leaving me in distress. Why is it re-appearing now? Once again, I was at loss.

Where is this Light experience leading me? Is it really about Christianity, or is it about some other cosmic New Age horizon. As my son noted, the closest symbol I got to Christianity was the symbol of the Holy Trinity (the flash out of a triangle) but aren't there other trinities? The Hindu trinity of Brahma, Vishnu and Chrisna; the Moslem trinity of Mecca, Medina and Jerusalem; trinities of political parties "Unity, freedom, socialism" of the governing Baath Party of Syria; "God, nation and family" of the Falangist party in Lebanon; etc ... How come there has never been a cross among all those visions? My son argued

### **The Cross:**

Six days later, on Sept. 9, the violet light appeared again, this time in full force: Beads of violet light filled a shape that looked like a diamond skewed forward, up in the sky. Then, the violet lights started migrating to cluster at the edges and at centre diagonals: At the centre diagonals, they made a cross as they transformed gradually into white dots; a cross of white light dots. Other lights migrated to the boundary forming a string of violet lights connecting the corners of the cross, while maintaining their violet color. It was a majestic and mysterious view that left me with a feeling of awe and bewilderment. \*(three sketches of violet and white colors on black background to be added)

So, finally, I saw a cross in Light; that settled my concern about the Christian connection, once and for all. Further, that must be my cross that I'm so willing to carry. But what was it? What service to God am I supposed to provide or endure?

- Missionary work?
- Help at food banks?
- More involvement in the Church?

I wished I knew what it meant. Perhaps the answer was in what surrounded the Cross and seemed to "support" it: The violet light, the skewed diamond shape and the strings. That led me to the questions:

- Since the violet Light is so close to the Cross, doesn't it imply that it is something good; but what is it? It was that light which kept my company every other night for several years, possibly over one thousand times, without giving me a clue of what it signified. I took it for granted until it faded away, much to my distress. Now, it comes back but with something new: connectivity to the Cross!

- What is that skewed diamond shape that started the vision? It must be representing something important, but how can I find out what does it symbolize?

- Is there a Theological reference about such shapes?
- Can I Google it?
- But how do I Google its description?

After feeling at loss for several days, suddenly, on September 12, I remembered that I vowed to reboot my journey as a three-year old child. So what would that shape mean to that child?

- A KITE! How did I miss that?!
- But what does the kite mean to the child? SOARING HIGH of course!

So, with the Cross as the back-bone of the kite, the message is: "The Cross is the back-bone of what makes you soar high". I felt so delighted at the certainty of this conclusion. But the integration of the Cross with the kite suggests a complementary statement: The kite is what carries the Cross high in the sky. The Cross strengthens it and it carries the Cross. Finally, the boundary was like strings stabilizing the cross; but what were they? And why was the Cross of Light dotted rather than solid?

Day and night, I kept wondering about the kite and strings of violet lights which are clearly so integral with the Cross, yet are totally beyond my comprehension. Seeing how important they were to the Cross, I couldn't ignore them, yet I had no clue of what they were.

### **Awakening at the Pantokrator icon:**

A week later, on Sept. 19, while gazing at the Pantocrator icon above my bed, a gaze that lasted longer than my usual glance, He seemed to be declaring more than His divinity: He was an instructor charging us with the purpose of our lives. I could hear Him saying (without sound ... like a feeling within): "It's every one's duty to link Heaven to Earth" and He confirmed it with His hand jester, downing His finger to touch His thumb. The point of contact is us and the circle formed by the two fingers was to emphasize perfection: "Do it perfect like the perfection of the circle and do it with precision like the sharpness of the point where two fingers touch each other".

As to you, He "said": "This is your lot". I saw the cross/ kite emerging from His fingers \* (icon with cross of white dots and violet strings to be added). It was a perfect fit like an absolute command. I felt happy for the confirmation of my cross, but I wondered what was it? And what the violet dots of lights had to do with it?

In a trance I could feel His voice:

- "Remember the Ultraviolet Catastrophe!"

-- "The Ultraviolet Catastrophe that lunched Quantum Physics!", I said in my mind. How did I miss that?! The dots of light represent the dots of quanta and the violet light is the closest visible light to the ultraviolet light! It became so obvious now! How did I miss it over a thousand times, seeing it every other day for over seven years, yet never comprehending it?!

- "It was because of your interpretation of the Schrodinger equation's disappointing light"

-- Yes, the first Light vision, 30 years ago, was contrasted by the artificial and deceitful neon light by which that equation was written. So isn't that an indication that the truth is not in science?

- "The truth of the world is not an equation. Observe the world"

-- Indeed, when we observe the world, we see how broken it is: quanta = broken. A broken world, represented in dots, cries for Your salvation. But the equation was not dotted: it was continuous which is a claim of perfection that no human thought deserves. It took me 30 years to have it explained to me; why didn't it happen earlier?

- "You didn't ask"

-- How wrong was St. Augustine's assertion that only the human will is corrupted, but not the reason (reference to be added). Without Your revelation, I could have never realized the difference. That is the general state of affair in the whole scientific community. Now, I see that my cross is in searching for Your image in the broken world pictured by Quantum Physics. It's a pity that I abandoned it three decades ago and almost totally forgotten it, making it so difficult for me to use it again... But a cross is a cross.



-- One other question: Why did the violet lights migrate to the boundary into a string-like formation?

- "The String Theory"

-- (In horror) The String Theory?! But I know nothing about it! That theory started just as I was finishing my study of Quantum Physics. I know nothing about it! I only hear that it is very difficult, with very complicated mathematics that is over my head! It will take me decades to catch up with the science of the last 30 years. How long I'm going to live?

- (No answer)

-- I feel like that cat in the joke of someone who moved the fridge upstairs by loading it on a cat ... under the whip. I don't have a clue of how am I going to create a synthesis between Theology, Quantum Physics which I forgot and String Theory which I know nothing about. But rejecting that cross after all the vows that I made for regaining the Light, is unthinkable; on the other hand, asking for an alternative cross is impossible as beggars are no choosers. I will comply.

-- But why the String Theory? Wouldn't it have the same fate as Schrödinger theory with a false claim of perfection?

- "Look for the brokenness in it"

-- So, that is why the strings were dotted, representing some brokenness in it.

-- One last question: Why was the cross dotted too?

- "Because it is your cross. It is a cross in a broken world"

-- Implying that I can't hold it together alone. I will have to seek Your help in staying on its track. I will start immediately and I will report to you daily.

Wondering how am I going to do it: where do I start? What references? Where? How? What? I don't even know what to ask. Then, still gazing at the Pantocrator icon, I saw the Big Bang launching the cosmos from the point where His fingers met: They were barely touching, which is why the cosmos started from such a miniscule point. It was a point of radiation of the same nature as light (only shorter wavelength). <sup>\*</sup>(icon with sketch of the Big-Bang cosmic start, superimposed on it). In the beginning there was light (Gen. 1:3). That would be a good start.

Since that date, Sept. 19, I have been faithful to my vow to Christ submit to Him, together with my prayer by end of the day, my daily report about my study and research. It includes either a new point about His presence in the cosmos, or a new question seeking His help. A summary of those reports is what makes the scientific part of this paper.

Within the two days following that experience I dug out enough references to update me on Quantum Physics, String Theory and Quantum applications in life sciences. That helped me see the task with more clarity, albeit with awe and apprehension. I was mobilized into a crusade mode ... of putting in the utmost effort with no holds barred. With all hesitation gone, the following seems fitting:

### **Quest for Purity/ Transfigured Sky:**

Two days later, on September 21, while contemplating the essence of chastity, I dozed off and saw a vision:

All the sky was lit with white and light-blue light that, somehow, originated from a hidden source. It was not blinding light but it was comforting and trust-worthy. The transparency of the sky was visible in three dimensions, all the way to infinity. Its transparency meant that the light was not reflected on it, yet it was in it. Suddenly its name popped up in my mind: "Quest for Purity". A feeling of bliss downed on me. It was the most beautiful entity I have ever seen: A transfigured sky that was out of this world.

I felt the need to preserve it by drawing it, but soon I realized that it can't be drawn because of its three paradoxes:

- Visible in three dimensions even though perfectly transparent; entities that are perfectly transparent, can't be seen at all, let alone be seen in 3-D.
- The 3-D was visible to infinity; nothing can be seen in 3-D beyond a certain distance, let alone a transparent entity.
- The light was originated from somewhere else, and certainly it couldn't be reflected on it because transparent entities can't reflect anything within their 3-D volume (only on their surfaces). Yet it was there: a light obtained from another light without being reflected on anything; just, light from another light ... somehow. .

I wondered if it could be represented, at least in principle, by a 3-D model of some transparent, jelly like, material; or perhaps by some 3-D movie tricks. After reflecting on it for several days, examining all possible model-building scenarios, I couldn't find a way to have any visual representation by any scientific or artistic means that preserve the three paradoxes ... the very same paradoxes which gave it its utmost beauty. I had to settle for the conclusion that the only way left for preserving the vision of the Transfigured Sky was to keep it alive in my memory. But how fresh can I keep it that way? And for how long? Not for too long, I'm afraid, unless I keep visualizing it all the time; but even with that, what will guarantee me that its impact won't dull out with the passage of time?

Next, was my worry about its applicability in real life. It was clear that this can't coexist with any violation of "Purity", not even with the mere thought of temptation. But how can the attraction to a woman be replaced by a vision of a certain sky? Isn't it like comparing apples and oranges? Yes, but one can still choose between the two even if they couldn't be compared intellectually. So, in choosing between what I want to have and what I can't afford to lose, I chose the later: the Transfigured Sky, and I braced myself for sadness over the expected sacrifice. To my surprise, it turned out to be no sacrifice at all:

Whatever was not transparent and luminous turned out to be not attractive at all. That included all the women, that in the past, I would have considered attractive. The beauty contest between them and the Heavenly Light ended before it started. The front-line of temptation attack, physical attraction, was nabbed in the bud. How about other forms of beauty? Searching for earthly beauty, other than external appearance, I could recall seeing it the transparent spirit of some; but it was obvious within seconds that they couldn't be compared to Purity. Only one particularly graceful lady was an exception: I could visualize her almost-transparent spirit and sunny personality as being an earthly version of that special Sky. Over several days, I visualized various aspects of her noble spirit as images of transparenance and light, but only to find that she falls short of the new bench mark. It was not a fair comparison to start with, but I had to try.

In the beauty contest, was there anything in this world that measure up to the beauty of the Transfigured Sky? Reflecting on what only a few days ago, I considered beautiful: Scenery of forests, mountains and oceans; castles and cathedrals; luxury cars and sparkling diamonds; harmony in solid geometry and lively dance; ... all were lacking by just being opaque and finite! All looked like desperate attempts of a fallen world. After exhausting all possibilities of finding anything comparable to that limitless beauty, by December 4, I considered getting married to that vision... to the beauty that can't be surpassed... What a feeling of peace and bliss! Thanks to God.

At the Pantocrator icon, I prayed for its preservation, with all my heart, begging Him to keep it alive. In my prayer

I reflected on how wonderful it was to see Light as universal as the True Light, yet not blinding ... a light that can stay with me, not just a blinking flash ... a light that, after a month and a half of living with me, makes me feel that I am going to be married to It. But then, wouldn't I need to know more about It? For example, why was it not made out of dots.

I could feel His response:

- "It is Light out of this world"

-- So, that is why it is not made out of dots.

-- Can I still keep it while in this world?

- .....

To my sadness, I found that it was beyond my ability to maintain that vision indefinitely, not only because it was very hard to adhere to "purity" in this world, but because the Transfigured Sky itself, when it was latter connected with String Theory, on December 25th, revealed a truth about the frenzied love of God, which was too intense for any creature to endure.

### **The Star/ M-Theory/ Reality check:**

I was getting concerned about putting so much effort into a plan based on visions. What assures me that they were really from a higher authority? What if they were all just unconscious dreams representing nothing but my internal concerns? Objectivity demands a proof to the contrary. Soon, I got the assurance I needed:

On Sept 30, I saw a star made of violet beads of lights in the darkness. At the centre of it there was a dark block or a book. I felt it was a very important entity, but there was one thing puzzling about it: It wasn't clear whether it was a five-poke star or six-poke star. <sup>\*</sup>(a pencil-sketch to be added)

A few days later, I read about the "M-Theory" (the "Master-Theory") in String Theory that is believed to be the ultimate theory in Quantum Physics (the beads of violet lights), unifying five string theories with an option of adding a sixth one ("11-D Super gravity"). The M-Theory is represented as a 5-poke or 6-poke star where each poke represented one of the five or six theories. <sup>\*</sup>(figure from ref. 5 to be pasted). The ultimate truth, scientists believe, is at the centre of the star. From that truth, all 5 (or 6) theories emerge as special cases. Currently, the central truth is not known. That mystery is a black block at the centre. It can double as a book of revelation at some point.

It was a perfect match between an internal vision and external entity that I knew nothing about, especially that the match was extended even to its peculiarity (5 or 6 pokes).

With objectivity concerns put to rest, I continued my daily study and reports to Him.

### **The Cosmic Cross:**

Oct. 3: A large cross of a cloud of violet lights appeared up high in the darkness. <sup>\*</sup>(pencil-sketch to be added) It looked like a cosmic cross that can be described by Quantum Physics. But that didn't make any sense until Dec. 25, when the vision of the Transfigured Sky merged with String Theory vision of space to reveal the enormity of God's frenzied love and His Cosmic Cross.

### **Bolt of Light/ God reaching out to the world:**

Oct. 13: A bolt of white Light whizzed down from Heaven striking the Earth (from top right to bottom left) <sup>\*</sup>(pencil-

Sketch to be added). Is God about to reach out to the world in a more visible way? ... Opening out our minds and hearts to receive Him? Only time can tell.

"He looked down from the height of His holy place" (ps. 102: 20)

### **More Lights:**

More light visions continued in parallel with my study and reflections on QM & String Theory. Most of them were like puzzles to me, but I wrote them down anyways, just in case they made sense later.

Nov.1: An arrow of white light piercing the sky from left to right. \*(pencil-sketch to be added)

Nov.2: A bundle of violet lights.

With no ability of finding a meaning to the above two visions, and with a feeling of loss as my reading of physics branched into a labyrinth of unclear paths, my enthusiasm for this project was waning; I was struggling in keeping my vow to the Pantocrator icon of finding a meaningful daily reflection on His presence in the world. The brokenness of my cross became clear; I wondered if there was any help on the way.

### **Invigorating Light:**

On Nov. 13, I saw a vision of a red-flame light, flickering like a lively dance. Remembering Acts 2:3, I took heart from this vision; some new awareness must be around the corner. This was my protector from the waning of the heart.

### **None-intersecting Lights/ The Science of Brokenness:**

Nov. 17: A vision of four lines of white dots of lights intersecting at one point. A zoom at that point showed that it was not a perfect intersection. \*(pencil-sketch to be added). It reminded me of a statement by Stephen Hawking that the universe was born with a broken symmetry. That is what caused its quantization. I.e. the universe was born a broken universe, right from the beginning.

So, I would say, Quantum physics should be called "The science of the brokenness of the World!"

Inspired by that, I wrote the "Apophacy, in Science, is on the Increase" below. Once that was done a new challenge came from the most unexpected place: Our theology class!

### **The Shield of Lights:**

There was a challenge at the Theology class on Dec. 2 when it was mentioned that Chimpanzees share 98% of human genes. The way it was mentioned sounded as if implied that they are 98% humans. The distinctiveness of humanity was reduced to a simple numerical advantage; and even that was not much: only 2% advantage over apes.

There must be something terribly wrong in that line of thought. I could hear the alarm bells wringing; because unless we can refute that thought categorically, we shall kiss the human spirit goodbye. For the next 10 days, I was on high alert searching for a protective shield against that kind of mechanistic thought. Then, suddenly, on Dec. 13, the vision of mystery lights (Sept. 3) made sense: That shape was a "shield" like two "shields" that I have at home: the symbols of "Alarm Force" (home alarm system) and the "American Society for Civil Engineers" logo\*(pictures to be added). How fitting! A shield for the home-security of our Faith, and a well-organized plan like an engineering project. The multi-color lights were the shield and the plan. If the violet lights represented quantum physics, what did the red and green light dots represent? Quantum applications in other sciences?

Divine help came swiftly through two unlikely sources: Two scientific- atheists, with whom I shared the "Apophacy Increasing" thought (mentioned above), stepped forward with papers on Quantum thinking, Comparison between humans and chimpanzees, and on quantum photosynthesis in plants. Those papers settled it nicely. Even the two atheists couldn't stand the thought that humans are not categorically distinguished from other creatures.

Was the quantum biology what the red light dots meant? And quantum photosynthesis what green light dots meant? I don't know, but that seem to fit well.

I was flooded with papers to read, about other sciences; too much information for me to absorb but a great testimony to the glory of God. It felt like a celebration.

### **Celebration:**

Dec. 18: A vision of a burst of violet lights, like fireworks.  
"Hallelujah! For the Lord our God the mighty reigns" (Rev. 19:6)

### **The merging of Transfigured Sky with String Theory**

Dec. 19: A vision of the Transfigured Sky as an expression of the REAL fabric of space. What we perceive as sky is the sky of the blind; very much as the "empty space" is the space of fiction. What I just read in String theory, was that what we call empty space is actually very rich in detail: It is made up of six dimensional tiny curled shapes, called Calabi-Yau shapes <sup>\*</sup>(a figure from ref. 5 to be inserted), as small as Plank dimension located at every point in our 3-D space. Those shapes are not made of matter; they are just abstract mathematical structures that carry loops of vibrating strings. Those strings are not matter that we can detect, but it is their vibration that is the matter of our world. Our world is the "sound" of the invisible "strings" of the 6-D invisible "violins". If we don't see that structure in empty space, it's because we are like fish in the water which don't know that water actually has molecular structure.

That led me to the question: What activity in the fabric of space corresponding to the vision of the mysterious luminosity in the 3-D Transfigured Sky? Certainly, it is not the vibration of "strings" because that would be our world, while that Light is out of our world. So what else could it be?

Soon after, I read about an activity that seems to be what I'm looking for: Those 6-D curled tiny shapes suffer tears that threaten to wipe out the cosmos if it wasn't a for loop of string shielding the rest of the cosmos from that tear <sup>\*</sup>(copy of figure from ref. 5 with string-loop added). But counting on an infinitely thin string to shield the tear is like you counting on a hoola-hoop to protect you from the bombardments of cluster bombs (5, p.279). The hoola hoop has to be at the right place on the right moment in order to intercept the first shrapnel coming your way; then it has to move with lightening speed to intercept the second shrapnel before it reaches you and so on and on; protecting you ceaselessly. What moves the hula-hoop in its ceaseless dedication to protect you? As we will see later, in the scientific section, there is no convincing scientific explanation; only God can use infinitesimally thin hoola hoops to shield every point in space from being torn apart.

No wonder, the Transfigured Sky is so luminous: It is the shining of the ceaseless protective activity of God everywhere in the cosmos. Finally, I have a worldly model of that vision: In String Theory's fabric of space.

### **The explosive outcome of the merger: The Cosmic Cross:**

Christmas night, Dec. 24-25, just after Christmas caroling at the Church: Reflecting on the matchless beauty of the Transfigured Sky, as I have been doing for the past one and a half months in my struggle to keep it alive; this time, it was in-avertedly connected with my reading about what is going on in the fabric of space as described above.

God's energy in His ceaseless preservation of the fabric of space, IS the Light that shines in the Transfigured Sky. All that beauty was an expression of God's frenzied love in His eternally shielding us from destruction. And to that love, I'm indebted for the blessing and joy that I drew from the vision of the Transfigured Sky. My heart was filled with such overflowing gratitude that I felt it was about to break at the seams.

But, how would He feel about a world that never holds up on its own? ... A world that, in order for Him to keep it in existence, He has to keep moving those hoola-hoops at the right place at the right time, every where and all the time! I don't know how would that feel in God's measure, but in my measure it is a cross beyond imagination ... a cross spanning the cosmos as long as there is a cosmos ... It is the Cosmic Cross that I saw on October 3rd!

Suddenly, I realized that the joy and blessing that the Transfigured Sky has given me was drawn from the Cosmic Cross ... from God's eternal suffering in His unimaginable effort in constantly shielding us from raptures of the fabric of space. I burst in tears for the suffering of God... horrified that it is God's suffering in mending our brokenness, is what gives us joy in the perfection of His Light... It's impossible to describe my grief for the suffering of God, as I visualized the Cosmic Cross as vividly underlying the infinite 3-D light... It was a runaway empathy for a cross spanning infinity; and I'm just a finite being... Alas, I was caught off guard: My usual shield, of cold exponent numbers that describe near-infinity with detachment, was down... It was that Light that kept me off guard as I was absorbed in its beauty, keeping me in a state of pure-feeling; only to be hit with the vision of the infinite cross of God... the infinite suffering of God. As I empathized with God in His suffering, I felt as if the full weight of Cosmic Cross is downing on me ... It was an emotional overload that was impossible to bear; I had to stop the whole meditation and pull back into this small world. The Light, with its underlying Cosmic Cross, is too big for me to internalize.

Shocked by the infinite suffering of God, I vowed never to add any burden to His, already, unlimited load; I should never ask Him for anything other seeing His Light (Not to be confused with "Quietism" as was suggested by somebody in our Theology class!) ... Just be grateful for His perpetual saving of our world... Don't keep asking for this and that, like a spoiled brat, who is always nagging, demanding and never grateful or empathizing... Be only praising in gratitude.

If the 6-D curled shapes could sing, they would be chanting hymns of gratitude for receiving His unlimited love and care; without which we wouldn't exist. Alas! How similar that is to the 6-winged Seraphim! Body-less creatures with four curled wings (and the other two would have been curled too if it wasn't for their need to fly). Angles that chant ceaselessly: "Holy, holy, holy, the Lord God the Almighty ..." (Is. 6:2 and Rev. 4:8). Finally, I can see where the ceaseless chant of the Seraphim, came from! Chanting on behalf what they mirror: The 6-D mass-less curled shapes.

For me, the Light gave way to the chant... the chant of the broken world. And, in order to honor my promise to the Pantocrator, I have to re-gain my composure so that I can see His presence in the world. Suddenly, in a flash, It all fitted together: The Cosmic Cross, the Transfigures Sky, String Theory, The Creed, Jn. 1:1-5, and a prediction for Cosmology in one harmony.

Long before the Original Sin, there has been the brokenness of space and time; and long before Christ carried the cross on Earth, the Word has been carrying the Cosmic Cross throughout all creation. His frenzied love is what shines in the Transfigured Sky; it was Light that came from a hidden source of Light, the Light of the Father: "Light of Light" (the Creed).

"In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through Him and without Him not one thing came into being. What came into being in Him was life, and the life was the light of the people. The light shines in the darkness, and the darkness did not overcome it" (Jn. 1:1-5).

If the Word has always been carrying the cross of creation, and since God doesn't change, then the cross of creation

has been since eternity and will always be. But that necessitates that creation has always been; an apparent contradiction with the finiteness of our universe unless there are infinite universes! Indeed, that is what the science has reached very recently: The cosmic inflation theory, according to which, new universes sprout from older ones perpetually <sup>\*</sup>(add fig. 11.2, ref. 9, p.321). Yet, the arrow of time (and with it, God's purpose) is preserved by the fact that the new universes are different from the older ones (Entropy keeps increasing as new universes emerge). (6, p.321). This time, Theology predicted a scientific theory!

But the ever-increasing entropy, according to cosmic inflationary theory, means ever accelerating deteriorations and raptures; which means an ever-growing need for God's intervention, an ever growing Cosmic Cross. It is very unsettling to think of an ever accelerating death and resurrection throughout creation.

With that unsettling feeling, comes the need for taking refuge in a world with no entropy or death... reversing the arrow of time to the beginning.. to the entity that gave birth to all the universes: The zero-entropy entity that started it all. In zero entropy, space and time have no meaning. It is timeless, yet for ever; space-less, yet everywhere. It doesn't die, yet, it is alive as it gave birth to all. It has the essence of everything that followed... those created entities are fragmented, therefore have no chance of any internal connectivity, correlation or meaning, except by tracing their fragments to their origin that is in the zero-entropy entity where all is connected in oneness. That is where we look for refuge: "Abwoon d'bwashmaya" in Aramaic (10, pp.10-13) which is translated loosely as "Our Father who art in Heaven" (Mat. 6:9-13). Going beyond that shallow translation, back to the original Aramaic words: "A" means "the Absolute, the Only Being, the pure Oneness and Unity ..." (10, p. 13), that is the "Father" in the Holy Trinity; "bw" means "a birthing, a creation, a flow of blessing from the interior of this Oneness to us" (10, p.13), that is the "son" in the Holy Trinity; "oo" which is pronounced in a breathy way, means the breath or spirit, the "rukha d'goodsha", the "Holy Spirit" in the Holy Trinity; "n" a sound that echoes the earth. So, I see that "Abwoon" means the "Father" and the "Son" and the "Holy Spirit" all together echoing on earth; "d'bwashmaya" too has multi-layered meanings that include "You that create all that moves in light", "Creator of the Shimmering Sound that touches us" (10, p.12). Remarkably, the spirit that emerges from String Theory, is an echo of the spirit of the actual words of Jesus.

Praise the Lord, now His words can be read in the cosmos!

### **"Stitching" the Scripture to the cosmos:**

Christmas morning, Dec. 25: A bunch of beads of all-color lights. An implied statement accompanied them: "These are the stitches that stitch the cosmos to the scripture. The multi colors represent the many applications of Quantum Physics in various sciences". By that time, I had enough scientific material to convince me that a synthesis between science and Scripture is inevitable. The old synthesis between Biblical Christianity and Greek thought, which still dominates our Church until this day, is to be superseded by a new synthesis between Biblical Christianity and today's quantum science. That includes not just quantum mechanics but other applications spanning virtually all science:

- Quantum photosynthesis in plants.
- DNA resonance with light quanta, Quantum Thinking that results in "consciousness" <sup>\*</sup>(graphic representation to be added)
- Quantum Leaps in Evolution.

In every case, quantum processes have apophatic components that beg for the presence of God. That synthesis will not be continuous, but will be focused at pivotal points in the scripture that are enough to create a convincing correlation between the two with Faith bridging the rest.

### **Down-to-earth/ Recapping my experience so far:**

- The blinding Light is the ultimate reality and meaning that renders all earthly entities as mere shadows.



- The Light of the Transfigured Sky is the ultimate beauty and security that eclipses all beauty and goodness on earth
- The Cosmic Chant overrides all songs and hymns on earth.

By Dec. 19-25, I wondered how would that fit with my original aim of preaching Christianity, or at least its core principles, in down to earth language of the day.

Alas, I ended up going to such abstractions, like the merging of Transfigured Sky with String Theory and reaching its explosive outcome: The Cosmic Cross which was too big for me to internalize. What an irony! What credibility can such abstractions have in down-to-earthiness domain?

Yet, the truth was solidly embedded in the highest abstractions of both scripture (especially in its Aramaic origin) and quantum science; so that can't be abandoned. It should be made credible even in a down-to-earth presentation. Leading by example, I should earn the utmost worldly credentials I can attain. Then, and only then, I can have a hope of bringing the Scripture-quantum science synthesis down-to-earth. I had to break the moratorium, I put 19 years ago, on accepting any corporate position so that I can put a limit on my ego that threatened my Light experience. Now, I have to take that risk to my spirit in what might be an ego-infested environment. So, on Dec. 24, I applied for the highest-profile down-to-earth engineering position I could find; surprisingly, I got it almost instantaneously. I took that as a good omen, signifying God's acceptance of the plan.

Now, it is a struggle tri-balancing Scripture/Light experience, quantum science, and engineering/management worldliness; but it is the cross that I accepted; beggars are no choosers.

Sadly, as I feared, once that high-profile position started in late February, all Light visions ended: Ego and Light don't mix; but it was the dark tunnel I chose to go through for the sake of giving earthly credibility to my Light visions.

### **Double-lined cross:**

Dec. 27: A cross of violet lights in the dark sky. It was made of two lines of dotted lights. Its corners were connected by two strings of violet light dots as well. \*(pencil-sketch to be added)

Given its violet lights, it seemed to relate to the Cosmic Cross; the double lines suggested that it has two origins:

- Theological: If Christ has suffered as God, then God is eternally suffering (since God doesn't change)
- String Theory: If the fabric of the cosmos (space-time) is always broken and is in need for God's intervention, then God is in constant suffering, mending it.

The double lines of strings, connecting the apexes of the cross, suggest double support to the Cosmic Cross:

- The rips in the fabric of space
- The quantization of time

Both need constant mending by God, therefore providing double proof on the existence of the Cosmic Cross.

### **Eight-poke star:**

Dec. 30: An eight-poke star of multi-color lights in the dark sky. Its pokes stretching into infinity while getting thinner and thinner, asymptotically. At its core, it was a perfect fit; no broken symmetry here. \*(pencil-sketch to be added)

It looked significant, yet for several months I couldn't figure out any meaning to it. Only now, I feel it could be a hint that God's creation, in its entirety, is symmetrical. That necessitates that there should be several universes that are symmetrical to each other, while each one of them is asymmetrical. God's perfection shows in His whole creation, but not in any singular part of it.



For six weeks, following Dec. 30, there were no light visions. I hoped that it was because such visions have achieved their goals for now; I would shedder of the thought that they have abandoned me for ever. However, as long as I kept my daily reports to the Pantocrator, the daily blessing that comes from the dark continued; a feeling of blessing even without Light. Was that a watered-down version of blessing, or was it another stage of blessing? I wish I know!

However, another Light vision came, seemingly, in response to a question that we wrestled with in the Theology class: "Can the rational mind recognize God?"

### **Light in the heart:**

(This was the last Light vision: As I feared, once my high-profile position started, all Light visions ended. No matter how hard I tried to avoid pride in my new position, some of its ego-poison would seep into my spirit. My consolation is that it is a temporary mission: Just enough to win earthly credibility to my preaching. With the Grace of God, I hope to cleanse myself of its poison once this mission is accomplished)

Feb. 12, 2014: A beam of intense light, from the right side, aimed at the heart of a man (a generic man) who was facing the light, pashing him back (to the left). His heart area glowed so brightly that I couldn't see any features in that area; but a trickle of the light reached the rest of his body all the way to his head and feet, the features of which could still be seen as the light in them was minimal. \*(pencil-sketch to be added)

God connects with us only in the heart. A trickle of that reaches the reasoning mind (head) and the objective mind (feet on the ground). The heart is totally absorbed in God, to the degree of losing its individual identity; while the mind, both reasoning and objective, retain its individual identity as it receives only a trickle of faith. Faith is a total commitment in the heart but a compromise in the mind. "Knowledge puffs up, but love builds up" (1Cor. 8:2); "Avoid the profane chatter and contradictions of what is falsely called knowledge" (1Ti. 6:20); "He has made known to us the mystery of his will, according to His good pleasure that He setset forth in Christ" (Eph. 1:9)

That is why, science had to wait until it matured in apophasis, before it can participate in the Faith. Here is the story of its growing apophacy:

## **The Harmony of Theology - Science:**

### **Apophacy, in Science, is on the Increase:**

Apophacy in science seemed to be dead by the end of the nineteenth century.

Science was perfected, or so it was thought, into deterministic, clockwork view of the universe. That was optimized by the French mathematician Pierre-Simon de Laplace who asserted that the perfect determinism of Newtonian mechanics means that, in principle, everything in the universe can be predicted if enough data was available. There is nothing that can be uncertain. (5, p.341). Late in that century, Maxwellian electrodynamics seemed to complete the picture by incorporating electricity and magnetism into an equally deterministic framework. By the end of the century, it seemed that science had it all known: Nature follows its own rules that are all embedded in this world; that leaves nothing for free-will, which is the essence of Faith, and there would be no need for God either, since everything is perfectly understood. God is pushed away.

Leaving nothing for Apophacy, that science, became like a brick wall separating the longing for Faith from the respect for one's own mind. No wonder, atheism became an indication of one's sophistication and thinking-out-of-the box". No wonder that Carl Marx who came in that era, adapted its atheism as a pre-requisite for being "illuminated". So was liberalism that was even ahead of its time such as in the French revolution.

But, as we will see, that fools-paradise came to an abrupt end with the "Ultra Violet Catastrophe" of "blackbody" radiation in 1900. The intensity of ultraviolet radiation was drastically less than what was predicted by classical science; throwing its credibility into question. The name given to it: "catastrophe" highlights the panic that classical science went into; as if it sensed that its end, as a teller of fundamental truth, is near. Indeed, what came out of that catastrophe stripped classical science from any claim to the ultimate truth; reducing it to serving only as applied science.

With the first successful mathematical representation of blackbody radiation, quantum mechanics was born and, with it, apophacy-in-science. More to that in the QM Introduction, below.

Being too attached to the past, or perhaps too proud to concede Apophacy, physicists called it "quantum weirdness" (5, p.112). They hoped that this Apophacy, or "weirdness" as they called it, would go away with more research; but they ended up with new Apophacy/ "weirdness" that was increasing. They were not just kicking the can down the road; they were rolling a snowball down the hill. Apophacy has been increasing for over a century. It reached a point where failure to acknowledge it is plain "absurdity", in Feynman's word (5, p.111). To reach that conclusion, I summarized the evolution of physics, for the past 113 years, in a way that is comprehensible to none-physicists.

1- Year 1900, Max Planck succeeded in finding mathematical equations that described blackbody radiation accurately, including the problematic ultraviolet radiation. But that came at a price: He had to use summation (of discrete wavelengths) instead of integration (of a smooth continuum of wavelength). This was to say that not all wavelengths are allowed, without giving any reason for it. This ad-hoc assumption was a total mystery that ran contrary to known science of that era. Quantum mechanics was born. (QM, Introduction, below). He was awarded Nobel Prize in physics in 1918.

2- To explain that mystery, Albert Einstein proposed, in 1905, that light comes in lumps that he called quanta. (5, p.94). Beyond the fact that it worked, there was no explanation for it; no answer to "how" light is lumped, just another ad-hoc assumption. The new mystery seemed to exceed the preceding one by adding a dual nature to light: mass and wave at the same time. He earned Nobel Prize in physics in 1921.

3- To explain the lumps mystery, Niels Bohr proposed, in 1913, that light is emitted when an electron jumps from one orbit to a lower one, and further, that those orbits are discrete with nothing in between (6, p.83). Once again, it was another ad-hoc assumption which, other than that it explained the previous one, has no explanation to it. The new mystery seemed to exceed the previous one. He won Nobel Prize in physics in 1922.

4- To explain the mystery of Bohr's orbits, Prince Louis-Victor de Broglie proposed, in 1923, that electrons are accompanied by waves that have to fit around the orbits in whole numbers. That forces the orbits to be discrete. (5, p.103). Other than explaining Bohr's orbits, there was no explanation as to why or even what are those waves. The new mystery seemed to exceed the one it replaced by adding the puzzling wave behavior to a mass. He won Nobel Prize in physics in 1929.

5- The wave behavior of electron was verified by George P. Thomson and by Clinton Joseph Davison, separately in mid 1920s, using diffraction through a crystal. (5, p.110). The mystery of dual behavior of electron was confirmed but not explained. They shared Nobel Prize in physics in 1937.

6- The wave/ particle mystery deepens. Waves of what? In 1927, Erwin Shrodinger developed equations for probability waves. That the electron is "smeared out" everywhere and distributed around the cosmos according to a probability wave: So, we don't really know where the electron is! The mystery continues to deepen. (5, p.105). He won Nobel Prize in physics in 1933.

7- The ambiguity of the probability wave, was even widened further by Richard Feynman, in 1948, by showing that

...19

a particle "sniffs" all possible paths everywhere in the cosmos, each with its own probability. The sum of all those paths with their probabilities, produces the observed wave behavior. (8, p.24 & 5, p.110). This mysterious "sniffing" concept became a pillar of quantum mechanics, and as we will see later, played a very important roll in String Theory. However, with Feynman himself describing it as an "absurd" feature of nature (5, p.111), Apophacy became official. He won Nobel Prize in physics in 1965.

... Apophacy continued to snow-ball with every new frontier of our vision of the cosmos.

Since so much of this essay relies on Quantum Mechanics, a brief introduction is warranted.

## **What is Quantum Mechanics?**

### **1- Introduction:**

QM is what describes the atomic and subatomic world (let's call it "small-scale world") (5, p.86). While the world around us looks continuous in space, time and energy, the small-scale world is not. It is made of discrete jumps: First, energy was observed to come in lumps; later, String Theory (ST) added discreteness in space and time. With these jumps come uncertainty starting with the "Uncertainty Principle" that was the first indication ever, of a fundamental Apophacy, even though limited, in science. Later that uncertainty showed manifestations in wide range of areas, some of which are related to life.

It all started by the curious experiment, in late 1800's, of "The Blackbody Radiation" (6, pp.43-44; 7, p.3). "Blackbody" is defined as a mass that absorbs all electromagnetic radiation applied on it. It can be made of a cavity in a bloc, such as carbon, with small hole connecting the cavity to outside the block. If the hole is small enough and if the cavity is lined with material that absorbs all incident energy, then the hole will look perfectly black, and acts as "blackbody".

When this block is heated to high temperature (900 K to 1650 K), it radiated energy. The energy within the cavity takes the form of waves bouncing back and forth within the walls like in a harmonic oscillator (like waves on a vibrating string). Some of that energy escapes out of the hole, as "blackbody radiation" carrying with it the outcome of harmonic oscillation within the cavity (very much like the music from the string of a violin). Vibrations of violin strings can be analyzed and predicted accurately by classical mechanics. So, it was thought that blackbody radiation will do the same (with classical electrodynamics, Maxwell's equations, and statistical mechanics added to classical mechanics). Based on that, Rayleigh and Jeans derived, in 1900, the expected distribution of blackbody radiation spectrum. It turned out to agree well with experimental results for long-wave radiation (like the red light) but disagreed violently for short-wave radiation; in particular, their analyses expected high intensity of ultraviolet radiation (wavelength shorter than that of the visible violet light) (7, p. 5 & 6. pp.43-44), but experiment showed much less value. The discrepancy was so huge that it dealt such a heavy blow to classical physics that it was called "the Ultraviolet Catastrophe" (6, p.46).

That was a rude awakening that ushered the downfall of what is now called "classical physics"; the time has come for a new science, with a totally different frame-of-mind that humanity has never seen its like before. Indeed, in that same year, 1900, Max Planck made an inspired guess by replacing integration (representing assumed continuity in radiation wavelengths) by the unthinkable summation of discrete wavelengths; the resulting predictions matched experimental results. With that Quantum Mechanics was born. Today, Planck has several entities called after him: Planck Constant (a proportionality factor that was included in his original work), Planck Dimension and Planck Time (the smallest possible distance and time interval according to String Theory).

## 2- The New Truth:

QM offers a radical departure from the deterministic, clockwork of classical science which was behind the death of Faith. Just when they thought they knew it all, by the end of 19th c, their science was facing three fundamental anomalies:

- Speed of light seemed to be constant regardless of the motion of its source. That was a contradiction to Newtonian Mechanics.
- Electromagnetic laws seemed to be vulnerable to variation resulting from the motion of the experimental device relative to the observer.
- Blackbody radiation and the "Ultraviolet Catastrophe".

God must have been laughing at them

But they didn't give up. The first two anomalies were resolved, in 1905, by Albert Einstein through his Special Theory of Relativity. He showed that the laws of electrodynamics remain unchanged with the condition that space and time have to be integrated together into a four dimensional constant. Further he showed in his general theory of relativity, in 1915, that space-time integration, when applied to gravitation, resulted in a more complex structure of space and time that curves by the presence of mass (5, pp. 56-76). Shocking as it seemed to some at that time, that was nothing compared to the "catastrophe" that will come from the third anomaly: The blackbody's ultraviolet radiation. At least, the theory of relativity maintained the continuity of space, time and energy with no fuzziness involved. Its equations are perfectly deterministic, once the location and motion of the observer are factored in, leaving no room for Apophacy. In retrospect, it looks like a refinement and integration of classical physics. On the other hand, the "Ultraviolet Catastrophe" as it was called, lived up to its name: a catastrophe to classical science, and I hope, to the atheism that came out of it. Its result, Quantum Mechanics (QM), is so different from every day experience that even 65 years later, it still looked out of this world; not only to a layman but to one of its own greatest scientists, Richard Feynman. This Nobel Prize in physics laureate said in 1965: "... a lot of people understood the theory of relativity in one way or other, certainly more than twelve. On the other hand I think I can safely say that nobody understands quantum mechanics". I say Amen ... unless you look at it through the lens of Faith: as an indication of the mystery of creation. Like the fingers of Pantokrator barely touching; an indication that God meets creation at an infinitesimally small point. That was the origin of the discrete points in QM.

The lesson we learn from QM is that the fundamental workings of the universe are vastly different from our day-to-day experiences. (5, p.108)

While QM has been around for more than a century, the prevailing frame of mind in science and in society at large is still built around classical determinism. Many prominent modern physics scientists, like Hawking, are atheists even though they unwittingly produced work that can help the faith. It is a mirror image of the early classical scientists like Newton and Pascal who were devout Christians, yet produced a science that was later used for atheism. As I see it, QM and the findings that were built on it, provide great help for our Faith. By changing the angle from which we examine those findings, we can see glimpses of the Faith where others might not.

## 3- Quantum "Weirdness" (in the words of the renowned Theoretical Physicists Brian Greene (5, pp.112-116) and Elmer E. Anderson (6, pp.62-64))

Uncertainty Principle (The primary Apophacy in QM):

In our everyday experience, the position of any object around us can be determined with infinite accuracy, at least in principle. That is not the case in QM, according to the "uncertainty principle" noted by German physicist Werner Heisenberg in 1927: The accuracy of determining the position of any object is limited by the wavelength of the radiation that is used to detect it. When we apply that to an electron, the wavelength needed to detect it has to be equally small. But that corresponds to a radiation with a large photon mass that will result in large change in the electron's momentum. To reduce the disturbance to the electron's momentum, we can use radiation with small photon mass; but that corresponds to a radiation with long wavelength, resulting in a large error in determining its position. To have both position and momentum determined accurately, we need a radiation of short wavelength and small photon mass as well. Sadly, that entity doesn't exist: either short wavelength but with large photon mass, or small photon mass with long wave. Tough luck; that is what is given to us. With that, we have to live with a minimum error that can't be reduced regardless of how good our equipment are. That was shocking even to Albert Einstein who argued that in principle, the electron has a well determined position AND momentum. But physicists John Bell and Alain Aspect showed experimentally that Einstein was wrong. The uncertainty principle was confirmed and is described by:

The error in determining position times the error in determining momentum can't be less than a finite quantity called Plank's constant.

By similar reasoning: The error in determining time times the error in determining energy can't be less than Plank's constant.

The later leads to another QM weirdness:

#### 4- QM Tunneling (and the Virgin Birth of Jesus):

Can you walk through a wall?

In QM, yes if your particles are coordinated enough and if you can move fast enough: A particle trapped behind an "energy wall" can borrow energy from the universe provided it can repay it back within the time period determined by the uncertainty principle. Once out of the well, it can pay the borrowed energy back. But for you to walk through the wall, you need to have ALL the particles of your body borrowing energy at the same time, then moving through in full tandem. That has very low probability that is nearly impossible, but not exactly so. For a cosmic event like the birth of Jesus, that very small possibility can happen so that He can still be born from a virgin who remains virgin all through the birth. He has QM tunneling available to Him if He wished so.

#### 5- Dual nature: Is it a wave or is it a particle?

Strange things happen in QM:

- Light, which shows every sign of being a wave, was found to have properties of particles (called photons) with all the impact that comes with it. (5, pp. 97-103)

- Electrons that are well known to be particles, surprised scientists by behaving like waves (the double-slit experiment) \*(Diagram to be added, 5, pp.103-105)

In the end, it was found that all matter in the universe have wave character while being made of particles too. How can matter have dual nature?

Feynman's statement that "nobody understands quantum mechanics" clearly applies here. But for a Christian, who believes in the dual nature of Christ, that is easy to understand: matter is simply an image of its Creator carrying the fingerprints of His dual nature.

## 6- The weirdness of "sniffing":

The wave-like behavior of the electron, as discovered by the double-slit experiment, raises the question: Wave of what? It was found to be a wave related to the probability of finding the electron at a certain location at a certain time. Feynman showed that this probability comes from the electron "sniffing" all possible paths from its starting location to its final destination ... that is "sniffing" all possible paths all over the universe \*(5, p.110. fig. 4.10 to be added)

But how can the electron "sniff" all possible paths around the universe before even starting? Feynman would say it's one of the weird features of quantum mechanics. But would it be so weird if we look at our universe as a projection of a higher existence that "sees" everything in this world at once? From Christian point of view it is not weird at all; in fact it should be expected: The Exaton sees everything at once all the time; our matter gets direction from Him. Once again, our world relies on Him for direction all the time

## 7- The mystery of "Entanglement" (as shown above under Part I):

Entanglement describes connectedness, between elementary particles, that defy explanation. For example, two electrons on one atomic shell cannot spin in the same direction: one should have "clockwise" intrinsic-spin while the other should have "counter-clockwise" intrinsic-spin. If one of them is flipped, so that it reverses its spin, then the other will reverse its spin instantaneously. This is called "Pauli exclusion principle" (3, p.11). It just states an empirical fact that has no explanation by any of the known forces of nature. The two electrons are mysteriously "entangled". In this case, the entanglement takes an exclusion form.

Mann chose another entanglement: Polarized photons (2, p.14). If two electrons, originating from the same source are entangled (spined in the same direction), then they will remain entangled even if they were later separated by a large distance. If one of them changed the direction of its spin, the other will do the same instantaneously. That puzzled Albert Einstein who refused to believe that there could be instantaneous transmission of information, even in principle. A verification experiment was performed and Einstein lost the challenge. Entanglement between far-away particles is a fact. It can be used to transmit instantaneous information in totally secured ways, it can be used in quantum computing, and it can offer a parable for theology concerned about connectedness-in-separation.

Entanglement in quantum physics offers invaluable support to our understanding of the Holy Trinity:

The three persons of the Holy Trinity are connected while separate. The Holy Trinity is not just three faces of one God (otherwise, how can we explain the baptism of Jesus); nor it is a committee of three gods. It is three separate persons entangled in infinite love (4). Many heretical ideas can be swept aside by inspiration from quantum entanglement.

## 8- Too much unconnected data:

The number of fundamental particles exploded with diverse properties that defy explanation (5, pp.7-12), and QM principles seem to be nothing more than ad-hock collection of statements that are not connected to each other. That led to great unifying effort that resulted in String Theory.

## 9- String Theory:

### 9.1- "Strings":

\*(5, p.14, add Fig. 1.1)

Matter is made of atoms, which are composed of electrons spinning around a nucleus. The nucleus is made of protons and neutrons (only the hydrogen atom has no neutron). Electrons and neutrons (called nucleons) are made of three quarks, of almost equal mass that are bound together by a very powerful "Strong Force". Both quarks and

electrons are the excitations of vibrating strings. These strings are of finite dimensions in the order of magnitude of Plank dimension (mentioned earlier). This finiteness of dimension, rather than being point-like particles, solves the problem of infinite gravitational force at a point-particle and replaces it by a manageable force. However, in doing so, it creates a demand for extra dimensions: six tiny curled space dimensions at every point in our three dimensional space. Both their size and spacing is in the order of Plank dimension.

## 9.2- The Fabric of Space-time:

Common wisdom tells us that empty space, is just that: Empty. If there is nothing in it, then there is no meaning to the three coordinate system (up-down, left-right, forward-backward, or simply x, y & z). That was changed as scientists started ascribing existence to empty space. Isaac Newton visualized it as x, y, and z reference coordinate system spanning the universe that can be used to define positions of matter. Albert Einstein developed it further by showing that it curves around matter which results in altering the movement of other masses in what ends up being called "gravitational field". Both of them visualized it as infinitely smooth, whether it was curved or not.

QM showed that the apparent "smoothness" of space is only approximate: While it is almost perfectly true at large-scale space, it is drastically different at ultramicroscopic dimensions scale: At that scale "smoothness" is destroyed by the violent fluctuations of the quantum world. At Plank length scale (the smallest possible dimension), space becomes very unstable \* (5, p. 128, Fig. 5.1). That is where Superstring Theory comes into the picture.

However, early String Theory, in 1968, was not interested in the fabric of space; it was only about matter. It was observed that some "elementary particles" with what seemed like ad-hock properties, can be unified if looked at as vibration resonances of some virtual strings (5, pp. 136-137). While the different vibrational modes of a violin string gives different musical notes, the different vibrational pattern of such strings gives different particles (masses and force charges) (5, p. 143). I wonder, who is playing the violin, the music of which is our world?

In 1974, String Theory was able to include gravity within quantum physics, a feat that was impossible by the Standard Model (Gravitation according to Einstein's General Theory of Relativity when combined with QM at ultramicroscopic dimensions produces infinite forces that are an indication of fallacy).

Later, as frustration over the explosion of elementary-particles physics into an unruly zoo of particles, huge effort was put into abstract mathematics in tandem with theoretical physics to create the first Superstring Theory revolution in 1984-1986 (5, p.139) resulting in more agreement with already established physics (Called Standard Model) but without the above-mentioned problems of that model. However, the resulting mathematics was so complicated that only approximate solutions could be found. That was partially solved by ushering the second Superstring Theory revolution in 1995 (5, p.40). The "Super" in "Superstring Theory" refer to its quest for unifying "everything": All known mass particles and forces (messenger particles). String Theorists like to call it "Theory of Everything" (T.O.E). However, the harder they work, to bring it closer to observed results, the more complicated it gets. Strings had to be accommodated on additional curled up tiny dimensions. Initially, it was thought that one extra space dimension would suffice, but work progressed, more dimensions were needed until it reached six dimensional spatial entities called Calabi-Yau shapes. These shapes, of Plank length, are located at every possible point in our 3D space (so they are spaced apart by about the same Plank length) \* (5, p. 208, Fig. 8.10).

That leads us to Quantum Geometry where the very fabric of space becomes the frontier of Superstring Theory. Mathematical spaces become entities of real existence that carry strings, the vibration of which is our world. (Think of the six-winged angels that sing ceaselessly) (Is. 6:2 & Rev. 4:8))

For those string vibrations to generate the three known families of particles (Electron, Electron-Neutrino, Up-Quark, Down-Quark; Muon, Muon-Neutrino, Charm-Quark, Strange-Quark; Tau, Tau-Neutrino, Top-Quark, Bottom-Quark) (5, p.9), the 6D Calabi-Yau shapes needed to generate three groups of resonances. That requires them to have three loops within \* (5, p.257, Fig. 10.4). These three loops have independent characteristics, yet are they all of the same essence: A unitrinity (like an image of the Holy Trinity).  
...24



### 9.3- Tearing the fabric of space/ The “Cosmic Cross”:

The fabric of space can tear if it was stretched to the limit. Black holes are possible examples; however, their cosmic "singularity" is believed to be shielded from the rest of the cosmos by the "event horizon"(the outer limit of the zone of no return). Tears also do happen in the Calabi-Yau 6-D shapes as they undergo transformations (5, p. 266). Unlike black holes these shapes have no "event horizon" shield; yet we don't see any catastrophic consequences to the fabric of the universe. Two explanations were proposed:

- Brian Greene (the author of ref. 5) with his team, were able to explain it by showing that the torn shape happens to have a mirror image that is not torn, and that both shapes are coupled, in that they give the same results. So, they concluded that the torn shape has been spared a catastrophe (5, p.276-278). That is reassuring, but it doesn't tell us why that coupling works. It was like an empirical result without any fundamental explanation.

- A more detailed answer was proposed by Edward Witten) whom Greene considers as the world's greatest living physicist). He showed that the tear within Calabi-Yau shape is actually surrounded by a shield created by a string \* (5, p.279, Fig. 11.6). But how can a string, being an infinitely thin loop, would make an effective barrier? It is like you are trying to shield yourself from a cluster bomb by hiding behind a hula-hoop! Witten answered that the string places itself at the right place at the right time, by "sniffing" all possible trajectories. It's the same "sniffing" principle proposed earlier by Feynman to explain the behavior of electron in the double-slit experiment. Here, the only explanation is the "sniffing" principle.

If you were bombarded by cluster bombs, while having a hula-hoop as your only shield. And if the hula-hoop actually managed to protect you by positioning itself at the right spot at the right time as to deflect every shrapnel of the bombs, would you believe that:

- The hula-hoop was "sniffing" all possibilities and acting on its own to protect you? Or:
- God's hand was moving it as needed?

There is nothing scientific about either answer as neither one of them tells us "how" did the hula hoop know how to move, but at least the second answer places the mystery where it belongs, and is consistent with the belief in a caring God. Further, the first scenario has nothing to say about why “sniffing” would be concerned about our safety; while the second answer has that automatically covered by a loving God.

The enormous and eternal effort needed to keep shielding the fabric of space from tearing apart all the time is like a cosmic cross carried by God since the beginning of the universe.

### 10- Delicate balance:

The existence and survival of the universe as we know it hangs on a very delicate "calibration" of matter and force particles. Some of the examples:

- The stability of atomic nuclei (composed of protons and neutrons, collectively called nucleons) rely on delicate balance between the forces that bind them together: Electromagnetic forces try to repel protons apart, while "strong forces" binds nucleons together (This strong force originates within each nucleon where it combine its three-quark constituents together). Should electromagnetic forces be slightly stronger, they would rip the nuclei apart, resulting in a world without atoms and without anything that we call existence (5, pp. 12-13). Should the strong force be slightly higher, nuclear transformations from one element to another, would be very different, resulting in a very different universe.

- Should the mass of electron be slightly larger than what it is now, then the electron of the hydrogen atom will



bond with its proton to form a neutron, thus collapsing the hydrogen atom into a single particle. With the disappearance of hydrogen, there will be no stars (including our sun) and no complex elements (that originate from hydrogen fusion) (5, p.13)

- Should the gravitation be slightly stronger, stars will burn much faster. Our sun would have burned so fast that there would have been no life on earth. A change in the opposite direction, slightly weaker gravitation, would hinder the formation of stars; our sun wouldn't have even existed. (5, p.13)

- Should there be a change in either the mass of the proton or in the "dark energy", the rate of the expansion of the universe would be so different rendering it inhospitable to life. (5, pp. 7 & 11)

And the list goes on and on.

Even, on earth alone there are many factors, essential to life, that rely on delicate balance. To give one example: Should the ionized zone around the earth be a little different, life would have zapped by harmful rays from the sun and from the universe at large.

With so many factors in delicate balance (the list could possibly grow infinite) one would ask: "Why" do all these entities have these exact properties? Some suggest that science has no answer for that (5, p.7); others suggest that String Theory provides an answer by predicting the existence of an infinite number of universes ("Multiverse" theory). With infinite number of universes, covering all possibilities, there has to be a universe like ours (even with all the delicate balances in it), and possibly many universes like it.

As we have seen earlier, if String Theory is true, while it answer the delicate-balance question, it creates an even stronger indication of the presence of a Creator: The very fabric of space is in constant need for mending as it keeps ripping itself apart. That raises the question: "Who" is mending it?

None-theists would ignore the questions like: "why" and "who" and focus on "how" things proceed from these given parameters. The assumption that the "why" and "who" questions would lead to the suggestion that there is a creator is irrelevant to them because such a creator, if really existed, is so cosmic that we will not be able to communicate with Him anyway.

My response to them is that the Creator cares about our very sustenance: His constant mending of our very fabric of space that continues to rip apart; and His ceaseless kick-starting our universe as it keeps disappearing all the time, are indications of His love and care.

## 11- Theory of Everything?

"Could God have made the Universe in a different way?" Pondered Einstein (5, p.283). Would the necessity of logical simplicity leave any freedom at all?

Einstein spend the last three decades of his life pursuing the Unified Field Theory, the ultimate theory, that will describe the universe objectively without running into any internal inconsistencies or logical absurdities. Even though he did not achieve his goal, he inspired many others, to pursue it. I was one of those who dreamed of it, and geared my graduate study in physics towards that goal. So far, reality check went against that dream: Not only no elegant theory was found, but inconsistencies and "weirdness" has been on the increase ever since. QM didn't fit with his General Theory of Relativity. When String theory managed to unify the two, it created very complicated mathematical equations that are far from the simplicity Einstein dreamed of, and it was not one theory but five (Type I, Type II, Type IIA, Type IIB and Heterotic-O). They differ in the geometry of their 6-D curled -up shapes and in the string vibrational patterns that they support (5, pp.284-288, 314).

In their quest for unification of all theories, string theorists discovered correlation's between the five theories, that gave them a hint for a unifying grand string theory called M-Theory (Master-Theory) \* (Fig. 12.2, p. 287). This "Second Superstring Revolution" required adding another spatial dimension to become 10 (our familiar x, y & z coordinates + the six curled dimensions + another unifying dimension), for a total of 11 dimensions with the addition time. (5, p. 287). Further, the M-Theory added more vibrating objects to the strings: vibrating membranes and vibrating blobs increasing the mathematical complexity much further. Yet, all what they are getting from it were just ballpark results. Complications continued, with the addition of a six theory to the M-Theory: 11-D Supergravity \* (5, p.315, Fig. 12.11).

That is a far cry from Einstein's dream of an elegant and accurate ultimate-theory. All what we are getting is more and more complexity with no accurate results. Isn't it time to recognize that "Anyone who claims to know something does not have the necessary knowledge; but any one who loves God is known by Him" (1Cor 8:2, 3)

## 12- Black Holes and Free Will:

With Laplacian determinism the belief of free will was at its lowest point (5, p. 341).

Heisenberg's uncertainty principle placed limits on determinism at the small-scale world by proving that there will always be a small uncertainty regardless of the accuracy of measuring devices. In principle, that alone should be enough to put an end to Laplacian determinism since a none-perfect determinism is no determinism at all. But, somehow, determinism survived albeit in a softer form. In particular, it was felt though, to be almost perfectly preserved at the large cosmic scale. But, in 1976, Hawking noted that even at cosmic scale, determinism is violated by the presence of black holes (5, p.342). When any matter is sucked into a black hole, its information is irreversibly destroyed. The fabric of space-time is not smooth as was assumed by Einstein's theory of general relativity; it is filled with creases and knots that destroy information (5, p.343). That is destruction of information at a new level in physics above the level of usual uncertainty of quantum mechanics.

Determinism is dead; free will lives on.

## 13- Humility/ Faith:

With science growing up out of its juvenile years, it sounds today more like a mature person reflecting on his naive-bravado youth.

"The history of science teaches us that each time we think that we have it all but figured out, nature has radical surprise in store for us that requires significant and sometimes drastic changes in how we think the world works", B. Greene (5, 373)

Isn't it about time to realize that our failing in understanding the universe means that we would better focus on reflecting on what is observed rather than trying to put it in an even more complicated theory that would lead to no where? (5, p.385 and "Awakening at the Pantokrator icon")

As Brian Greene wrote: "May be we will have to accept that certain features of the universe are the way they are because of happenstance, accident, or divine choice" (5, p.385). So, here we are now: We see 100,000 times further away than what we did a century ago and we see one billion time deeper into subatomic dimensions; a total widening of our observation range by 100 trillion times since Einstein's general theory of relativity, only to feel that we are chasing a mirage in the desert.

That brings us a full circle to the Bible: "Avoid the profane chatter and contradictions of what is falsely called knowledge" (1Ti. 6:20)

"He has made known to us the mystery of his will, according to His good pleasure that He sestets forth in Christ" (Eph. 1:9)

## Summary and Conclusions:

It has been a long journey since the human race ate the forbidden fruit believing the evil promise of reaching the ultimate knowledge; to be just like God. For thousands of years, humanity worked hard chasing that dream; quite often mistaking the dream for a reality; giving a blind eye for any glimpse of reality pointing to the contrary: The Pythagoreans demonized the only member of their group who saw an irrational number... so far for seeking the truth.

No wonder, the synthesis they created with Biblical Christianity, carried the seeds of its own destruction, right from the beginning. The Devil was cleverer than what many thought; but God's patience paid off: Humanity reached the end of its leash. Now, wisdom calls for recognizing our limits; or be strangled by a leash that is stretched to the limits.

In everything around us, from the Sun-shine to the green leaves and human consciousness, the science of brokenness is unavoidable; and at its core is un-know ability, un-calculatability, like an upright stick balanced on the palm of a hand with constant attentiveness by the hand's owner: God.

### ... And to God I offer my closing prayer:

I feared the cross You gave me, would be like a fridge loaded on a cat;  
Instead I ended up like a child lifted by a kite, a kite of Your Light.

But lest I think I flew too high, you showed me that I am at just a hair above hell, for which I'm grateful... given that my quest for purity is as broken as my cross is ... a cross in a broken world.

Yet, even this brokenness gave me a hint of Your cosmic cross:  
Unlimited and all encompassing... as You ceaselessly mend the countless worlds of Your creation... for all eternity, healing their innumerable ruptures and re-bringing them back into existence as they keep slipping away into oblivion...  
And they all sing for your glory:

Like the six-winged angels singing "Holy, holy, holy, the Lord God the Almighty, who was and is and is to come" (Rev. 4:8), the six-dimensional curled spaces carry your energy strings... (String Theory)  
With their vibrations, they give voice to the Word, and the voice of the Word is our world... (String Theory)  
"... For He spoke, and they were made ..." (Ps. 148:5)  
Our world, just by existing, sings your glory... (My interpretation of string theory)  
Like the Seraphim chant: "Holy, holy, holy is the Lord of hosts; the whole earth is full of His glory." (Is. 6:2)  
"... praying without ceasing" (1Th. 5:17)  
Every point in space testifies to your salvaging it from rapture (my interpretation of String Theory)  
"Praise Him, you heaven of heavens" (Ps. 148:4)

Like the vision of Transfigured Sky, Your glory shines everywhere ... with utmost purity ... crystal-clear transparency, yet perfectly visible for those who want to see... an unsurpassed beauty, all the way to eternity. (Vision of "Quest for Purity/ Transfigured Sky")

But none of that would have been possible without your incomprehensible sacrifice: Your Cosmic Cross.  
"... to reconcile all things to Himself, by Him, whether things on earth or things in heaven, having made peace through the blood of His cross" (Col.1:20)

Nothing in this world can be an end by itself: I pin my hope on seeing, once again, Your True light; the Blinding Light of Abwoon d'bwashmaya, our originator, the one with no entropy and no time arrow, yet who mysteriously lives on... I take refuge in the memory of Transfigured Sky Light (Sept. 21), the Light of the Word who takes care of this broken world; who balances the world like an upright stick on his hand, the Light that illuminate my way of the broken cross.....And, in the face of what looks like an overwhelming task, I feel protected from the waning of the heart, by the invigorating dance of the Red Flame lively Light (Nov. 13).

But sadly, by falling to temptations, again, I lost sight of Your Light; and like the blind, I searched for it in the dark, by hand and ear. I could touch/ read about it in Brielle language ... the dots of the quanta of the broken world told me about your constant mending of our ruptured space.

Brielle-reading what it takes to repair every point in our ruptured space, makes me shedder of the enormity of your sacrifice.

Then visualizing it all being repeated innumerable times in every second, overwhelms me with empathy to Your suffering.

No measure of gratitude would suffice to thank You for the innumerable times, in every second, You brought us back into existence.

Singing Your glory for eternity, falls woefully short of thanking you for even one second of Your love.

With words hopelessly crippled, an overwhelming feeling of gratitude and empathy sweeps all over me, as I see Your unlimited sacrifice and suffering.

Every tear I shed at the memory of your earthly crucifixion, turns into uncontrollable tears at the thought of Your Cosmic Cross.

With sweeping passion filling my heart, I bow to your unimaginable pain that you endure out of Your love to us...

The memory of seeing Your Cosmic Cross transcends me into melting in Your Cosmic Love ... I can hear nothing but the ceaseless Seraphim chant ... it keeps buzzing into my ears ... filling me with painful joy ... the joy of getting closer to You is painful for the impossibility of reaching You while I am in this broken world. No wonder the Seraphim cover their eyes! (Is. 6:2)

What a far cry from the awe of seeing the True Light...which is all that matters... from the pure joy of seeing the Transfigured Sky Light... joy with no pain in sight; purity out of this world... from the invigorating sight of the lively dance of the Red Flame Light.

Would I ever see Your True Light again?

That is what I pray for; but for now it's the chant of the blind in the darkness of the broken world... which is all what I can hear; the Brielle/quantum story of the chant, is all what I can touch; and memory of the three mysterious Lights, in the darkness of his broken world is the closest I can draw to You.

With that, I vow to carry my cross to the best I can: Searching for Your image everywhere.

**References:**

1. “String Theory and Multiverse: Philosophical and Theological Implications”, Science Symposium, Department of Physics, Wheaton College, Wheaton, Illinois, March 26-27, 2008
2. “Physics at the Theological Frontiers”, R. B. Mann, draft invitation essay on Perspectives on Science and Christian Faith, Canadian Scientific & Christian Affiliation, June 25, 2012.
3. Elements of Nuclear Physics, by Walter E. Meyerhof, McGraw-Hill book Company, 1967
4. Article by J. Zizopoulos in “The Trinity and an Entangled World:”, Ed. J. C. Polkinghorne (Eerdmans 2010), p.146
5. Brian Greene, *The Elegant Universe*, Vintage Books 2003
6. Elmer E. Anderson, *Modern Physics and Quantum Mechanics*, W. B. Saunders Company 1971
7. Robert H. Dicke and James P. Wittke, *Introduction to Quantum Mechanics*, ADDISON-WESLEY PUBLISHING COMPANY, INC.1960
8. Leonard I. Schiff, *Quantum Mechanics*, McGraw-Hill Book Company 1968.
9. Brian Green, *The Fabric of the Cosmos*, Vintage Books 2005
10. Neil Douglas-Klotz, *Prayers of the Cosmos*, HarperCollins Publishers, 1990