Will science know The Truth?

"Islam and The Quantum Theory"

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It is amazing! When you find that the God of modern civilization, science, is collapsing as a "God", in its own hands. It is saying, loud and clear: “I give up, find your true God!” And here is how I found it. Just follow the logic.

I will try to use layman's terms to make the read easy and enjoyable.

How science perceived the Universe before:

The wisdom, until the first quarter of the twentieth century, was based on Newton’s Laws of Physics, which stated that patterns repeat themselves, under the same conditions, exactly. A linear relationship between the cause and the result was how scientists dealt with the world phenomena. Apply a force to gain speed or acceleration; otherwise, things stay static. Simple and straightforward. In a nutshell, Newton’s mechanics is completely deterministic. What goes in, comes out.

However, in the first quarter of the twentieth century, Einstein opened the door for new perception, with his “general” and “special” theories of relativity, where he introduced the relationship between energy and mass, speed, as well as the time dimension. More importantly, his work on the Quantum Theory[1].

Over the same period, studies of heat waves and the behavior of sub-atomic particles led to a new understanding of how particles establish their position. It was found that Newton’s mechanics doesn’t support what was observed. That was when the Shrödinger's wave equation for matter was introduced. This has shown that the predicted position of any particle is neither accurate nor determined. Rather, it can be anywhere other than what was predicted, over a probabilistic equation. It can actually be in two places at the same time. Thus, the Quantum theory, which deals with the behaviour of the sub-atomic particles, established a non-deterministic mechanics, or dynamic mechanics.

That progress has been accompanied by some related concepts which helped to understand a closer view of the facts of the Universe, such as Dark Matter, Complex Systems, Split Similarity, attractors and strange attractors, incompleteness theory, and other concepts.

[1] Although he believed in the Quantum Theory, he did not believe that it was complete as of his time. This has been proven to be the case since that time. The latest studies of the Cosmic Bell Test at the University of Vienna (Alan Guth, Anton Zeilinger, and colleagues at MIT), suggest that the Einstein prediction on the “weirdness” of the Quantum Theory is not to be solved.

We will introduce each of the relevant concepts that we think are related to the subject of this essay.

Dark Matter/Energy:

Again, in layman's terms, Dark matter and Dark energy represent the difference between the calculated mass and energy of the Universe and the mass of "ordinary matter of galaxies. It represents 84% of the total mass-energy. This difference calls for a type of "matter" that is not counted for in our universe. This Dark matter does not interact with any electromagnetic wave spectrum known to humans. None of the particles of such matter has been detected. This means that most of what constitutes our universe is "hidden" and of unknown nature to us!

" وما يعلم جنود ربك إلا هو" المدثر 31

"None knows the soldiers of your Lord except He [alone]. This is nothing but a reminder for the mortals" (Muddathir: 31)

Complex Systems:

What is a Complex System? It is a dynamic system that evolves from initial conditions and is sensitive to them. It is not static, but dynamic. It consists of a large number of factors that are interacting in a non-linear way. Examples of complex systems is around us in every type and shape. From the growth of cancerous cells in the body to the population of cities and towns, networks, and almost all biological systems. The most important feature of a complex system is that the system is NOT a sum of its individual components. It evolves. In other words, systems tend to show more complexity when working together than they did in their simple initial conditions.

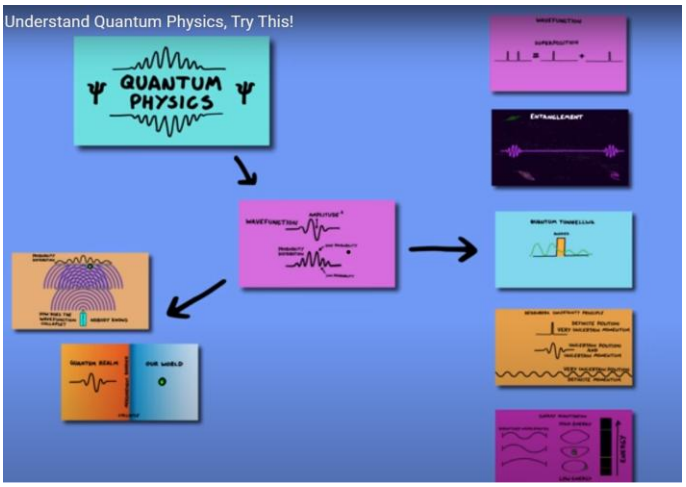
The study and understanding of the behavior of complex systems has helped pave the way to other theories, which are of utmost importance to understand our world.

Quantum Theory[2]:

Quantum theory was established and introduced by the two greatest scientists of all time, Max Planck and Albert Einstein, in the very early years of the twentieth century. The core of this theory suggests that particles at the atomic and sub-atomic level behave in a different way and under different physics laws than Newtonian laws of physics, which they called Quantum Physics, and they called such particles "Quanta". Einstein had proven that the electromagnetic waves are made of quantum particles.

In the pre-Quantum era, where the Static universe was the model that scientists suggested, one great scholar, Pierre-Simon de Laplace (1749-1827) said, "We must consider the present state of the universe as the effect of its previous state, and as the cause for what will follow. An intelligence which, at a given moment, would know all the forces by which nature is animated and the position of every object in the universe if indeed it was powerful enough to submit these data to analysis, would embrace in a single formula the movements of the greatest bodies of the universe and those of the lightest atom: nothing would be uncertain for it, and the future as the past, would appear before its eyes". This means that, according to the static nature of the Universe, a very intelligent force would be able to know the past and the future! A hundred years later, that was proven partially wrong.

Quantum Theory suggests that the particles, "Quanta," place, and speed can be determined simultaneously. It is just impossible. This also shows that the universe is Dynamic Universe is dynamic in all the senses of the word.



[2] *The Journey to Quantum Gravity, Carlo Rovelli,*

"وَالسَّمَاءَ بَنَيْنَاهَا بِأَيْدٍ وَإِنَّا لَمُوسِعُون " الذاريات 47

"We constructed the universe with power, and we are expanding it". (Zariyat: 47)

The fallout of Quantum Theory was that we can not, and will not be able to predict what is coming; the hidden (الغيب).

Uncertainty Principal

To add to that, in 1927, a great scholar, Warner Heisenberg, suggested what is called the Uncertainty Principle of Heisenberg, which is "a quantum particle, speed and location can not be simultaneously known". The principle means that the basic bricks with which the universe is built are completely unpredictable and undetermined. However, although this uncertainty is now proven as a feature of the Universe, we see the majesty of the physical existence, and the harmony of all creatures, which implies a "certain" direction that led to that harmony.

Coloured Mountains of Puro

أَلَمْ تَرَ أَنَّ اللَّهَ أَنزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ ثَمَرَاتٍ مُّخْتَلِفًا أَلْوَانُهَا ۚ وَمِنَ الْجِبَالِ جُدَدٌ بِيضٌ وَحُمْرٌ مُّخْتَلِفٌ أَلْوَانُهَا وَغَرَابِيبُ سُودٌ (27) وَمِنَ النَّاسِ وَالدَّوَابِّ وَالْأَنْعَامِ مُخْتَلِفٌ أَلْوَانُهُ كَذَٰلِكَ ۗ إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ ۗ إِنَّ اللَّهَ عَزِيزٌ غَفُورٌ(28) "فاطر

"Have you not seen that Allah sends down water from the sky? With it We produce fruits of various colors. And in the mountains are streaks of white and red—varying in their

hue—and pitch-black.27 . Likewise, human beings, animals, and livestock come in various colors. Indeed, from among His servants, the most learned fear Allah. Allah is Almighty, Oft-Forgiving28 . (Fatir: 27-28)

Chaos Theory[3]:

One of the major results of the Quantum Theory was the Chaos Theory, which is now used in many scientific, political, social, health and biology, and financial models and fields.

Initial assumptions of Chaos Theory are that there is no way to determine the position of a particle and its measurements simultaneously. We only know about the existence of a particle when we start measuring it, not before. When we measure the particle, it is only possible to measure either speed or location, as the other measurement will change instantaneously.

Remember what we have discussed about complex systems: dynamic systems with too many parts moving at the same time, such as weather, boiling water, etc. Chaos theory works on such systems, trying to find out how those parts behave, and there is a definite pattern they follow. The answer was found to be NO. it was found that because such systems are very sensitive to the initial conditions under which they were formed, a change in the result will always exist, even if we try to replicate the same conditions.

Edward Lorenz, of MIT, 1960, has proven with his computerized model that nature does not follow the patterns that are predicted to be generated, using the same initial values of a first run of his model, which was weather-based. This translates to Chaos and unpredictability. He announced that it is impossible to determine or predict the weather, even if we mimicked the same conditions every time in a lab.

" إن الله عنده علم الساعة وينزل الغيث" لقمان 34

"With Allah rests the knowledge of the Hour. He sends down the rain, and He knows what the wombs contain. No soul knows what it will reap tomorrow, and no soul knows in what land it will die. Allah is All-Knowing, Well-Informed". (Luqman: 34)

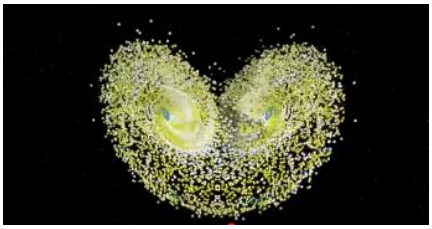
[3] "Chaos: Making a New Science", James Gleick, 2008

Attractors and Strange Attractors

One of the Mathematical concepts that is necessary to understand the Chaos Theory is called “Attractors”; a set of numbers that a system of particles forms when they are in a dynamic state, with a variety of initial conditions, tends to evolve. It can be presented in the shape of a Vector as the values of the attractor stay close, even with a small change in the initial conditions.

If the values of an attractor tend to repeat themselves in a specific pattern, it is then called a Strange Attractor. It is one of the most famous types of Strange Attractors is the “Butterfly Attractor”.

A famous initial model of the Chaos theory, based on Lorenz's work, was what is called the “Butterfly Effect”.

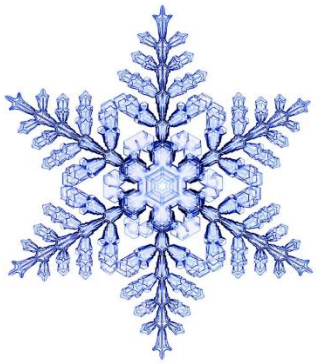


The Butterfly Effect

It was found that repetition of running a weather model many times would bring about different results; however, the general shape of the resulting “attractors” of all lands on a Butterfly shape! That is why it has been said “a butterfly in the East end of the world shakes its wings, and a hurricane is formed in the West end of Earth” or something close...

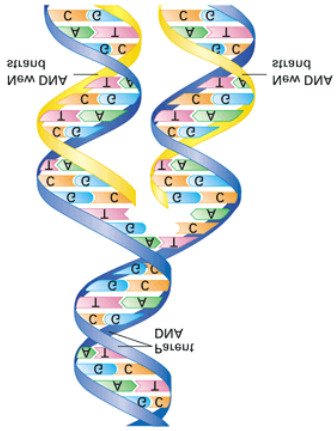
Self-Similarity Theory

Having reached this point, we can now understand the phenomenon of Self-Similarity, which basically comes from the Strange Attractor phenomenon. It states that particles tend to replicate and reorganize themselves in a dynamic complex system in the same shape as the original object, to an infinite number. An example is the snowflake, as illustrated below>



Branches of the original flake are duplicated almost exactly in the extension and growing process. Some variations might be noted at the sub-nucleus level, but in general, it follows the same pattern, all the time ... to infinity.

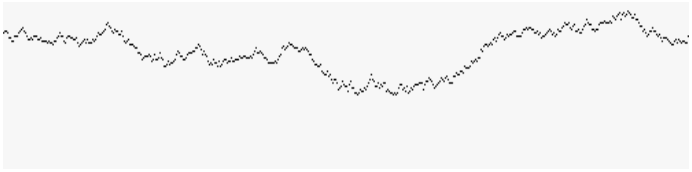
This is, as I see it, one of the most important results of the Quantum Mechanics Theory. If you examine the reproductive process of humanity as a very complex system, this observation can explain how all parts of that system resemble one another. We all share the same shape and number of DNA, same internal organs, and same body shape, except for small variations as described by the self-similarity process. It is the Guidance of the creator to put all such similar, but different creatures on this planet.



Related to this concept is the concept of “Scale invariance” concept

In mathematics, scale invariance usually refers to an invariance of individual functions or curves. A closely related concept is self-similarity, where a function or curve is invariant under a discrete subset of the dilations. It is also possible

for the probability distributions of random processes to display this kind of scale invariance or self-similarity.[4]



"قَالَ رَبُّنَا الَّذِي أَعْطَىٰ كُلَّ شَيْءٍ خَلْقَهُ ثُمَّ هَدَىٰ" طه 50

"He said, “Our Lord is He who gave everything its existence, then guided it.” (Taha: 50)

Incompleteness Theory

Another part of the new evolved dynamical physics is the “Incompleteness Theory” of Kurt Gödel. In a few words. if we have a list of axioms that we can enumerate with a computer, and these axioms are sufficient to develop the basic laws of arithmetic, then our list of axioms cannot be both consistent and complete[5].

Mathematics has been considered the only method to convey truth, possessing ultimate internal consistency and accuracy. With the emergence of the “Incompleteness Theory,” the Truth has fallen. No method now, within the reach of humans, can prove the complete “Truth”.

"يَعْلَمُونَ ظَاهِرًا مِّنَ الْحَيَاةِ الدُّنْيَا وَهُمْ عَنِ الْآخِرَةِ هُمْ غَافِلُونَ" الروم 7

They know an outer aspect of worldly life, but they are heedless of the Hereafter. (Rum: 7)

[4] Refer to the book “Waves in an Impossible Sea, MATT STRASSLER, 2024, and other of his online articles.

[5] https://en.wikipedia.org/wiki/G%C3%B6del,_Escher,_Bach

Superstring Theory

How they relate

- **Strings are the fundamental objects**[6] The core idea of string theory is that the universe is not made of point-like particles, but of tiny, one-dimensional vibrating strings.
- **Vibrations create particles (quanta):** The different ways a string can vibrate create different particles, which are also called quanta. A string vibrating in one way might appear as an electron, while a different vibration could appear as a photon or a quark.
- **Quantum properties are string vibrations:** The properties we associate with a particle, such as its mass and charge, are determined by the vibrational state of its corresponding string.
- **Unification:** String theory aims to be a "theory of everything," unifying all fundamental forces and particles into a single framework by showing that they are all just different manifestations of the same underlying string-like objects.

How they differ from traditional quantum mechanics

- **Traditional quantum mechanics:** This field describes the universe in terms of quantum fields, where each fundamental particle type (like the electron or photon) corresponds to its own field. The "quanta" are excitations or packets of energy within these fields.

  Also, fields can exist without particles in **quantum field theory. Particles only appear when there is enough energy to form a particle, photon, or quark.**
- **String theory's approach:** Instead of 17 different quantum fields as described in the standard model, string theory proposes that all these fields arise from the different vibration modes of a smaller number of fundamental strings in a higher-dimensional space.

[6] strings emerged from experiments — experiments on hadrons, back before we knew hadrons were made from quarks and gluons. The details are a story I'll tell soon and in another context. For now, suffice it to say that in the process of trying to explain some puzzling experiments, physicists were led to invent some new equations, which, after some study, were recognized to be *equations describing the quantum mechanical behavior of strings*, just as the equations of particle theory describe the quantum mechanical behavior of particles. (One advantage of the string equations, however, is that they were, from the start, consistent with Einstein's relativity.) Naturally, at that point, this class of equations was named "string theory"

- **Quantum gravity:** A key achievement of string theory is that one of its vibration modes corresponds to the graviton, the quantum particle that carries the gravitational force. This means string theory provides a natural and consistent quantum theory of gravity, something that is not possible within traditional quantum field theory.

In simpler terms, Scientists once studied **hadrons** (like protons and neutrons) but didn't know they were made of smaller pieces.

They observed experimental results that didn't make sense using the usual physics of **point-like particles**.

So, they invented **new equations** to explain the data.

After exploring these equations, they realized:

The equations already describe something:
a tiny vibrating string, not a point.

If a particle = point → old theory
If a particle = tiny string → new theory (string theory)

These strings:

- vibrate in different ways
  → Each vibration looks like a different particle
- follow quantum rules
- naturally fit with Einstein's relativity
  → a huge advantage!

So, this became known as: **String Theory**

And, because physicists were also struggling to combine:

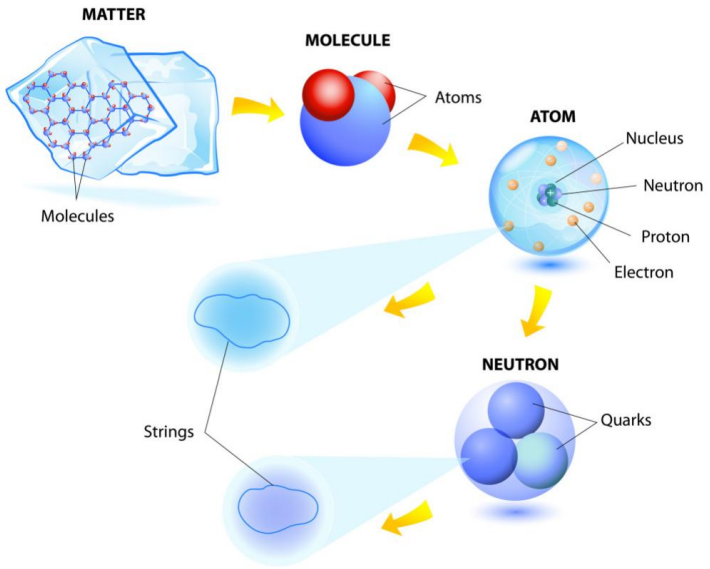
- **Quantum Mechanics** (microscopic scale)
- **General Relativity** (gravity & large scale)

String theory was the first framework that could combine them **without contradictions**.

A Step Toward Unification

That's why some physicists think it may be a major step toward a complete Theory of Everything. String theory's ability to reconcile quantum mechanics and general relativity, two previously conflicting pillars of modern physics, has led researchers to hope that it

could potentially unify all fundamental forces and particles into a single framework. By modeling particles as vibrating strings that follow both quantum and relativistic rules, string theory offers a promising approach to address the challenges faced in combining our understanding of the very small and the very large. This unification remains one of the most ambitious goals in theoretical physics, inspiring ongoing research and debate within the scientific community.



So, particles

Also, fields can exist without particles, according to **quantum field theory**

Conclusion

It is now evident that the Static deterministic nature of Newtonian physics has left the building! Whatever knowledge humans have on the table is turned over. The dynamic physics took over. The amazing result we have found in reviewing the new direction of science has reaffirmed what the revelation had put forward, fourteen centuries ago. The incompleteness of Mathematics, the unpredictability and uncertainty of Universe events, made us acknowledge the fact that we know too little, and talk too much! The missing part of the Chaos Theory and the other theories we have reviewed above is the

power that fills the gap between the pure laws of the dynamic physical world and what is being created and “chosen” out of infinite possibilities. It is the Power Allah swt. Only Scholars can recognize, appreciate, and believe in His ultimate power.

"إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ إِنَّ اللَّهَ عَزِيزٌ غَفُور" فاطر (28)

"... Indeed from among His servants, the most learned fear Allah. Allah is Almighty, Oft-Forgiving". (Fatir: 28)