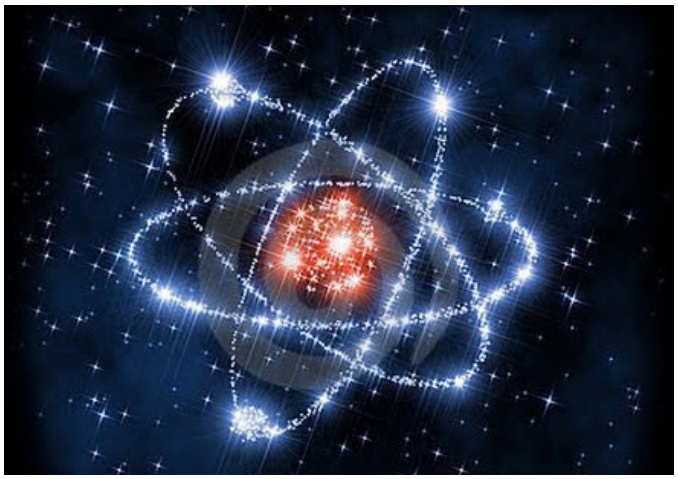
Spiritual Implications of Quantum Theory



In contemporary science, there is a lot of excitement about quantum theory. Unlike cosmology, which attempts to decipher how the universe works on a large scale, quantum theory is the science of the subatomic world. Of course the universe is built from atoms too, so one would expect to find a degree of common ground between the two approaches. However, it does not appear to be that simple. Cosmology is based on what is called classical physics, which also includes Einstein's theory of relativity. Classical physics assumes the universe to have a single, well-defined history and hence, a clearly predictable future. It assumes that if we have all the data about the present world, we should be able to predict how it enfolds in time. As such, it posits a theory of the universe as being more or less ordered, measurable and predictable. Quantum physics, on the other hand, works according to probability not predictability. It assumes all pasts and future's of the subatomic world to be true simultaneously, and as such posits a much more randomized and chaotic vision of existence and matter. Many of the physical laws and theories that have been derived from classical physics do not apply to the quantum world. Conversely, we cannot clearly identify the workings of the quantum theory on the bigger scale of our everyday life. So in sum, no one has so far discovered a clear link between how things behave a macro and micro scale.

Whether consciously or subconsciously, we all assume a certain underlying model of how reality works. This is an inherent function of our mind that enables us to build a coherent picture of our world and our place in it. For instance, our visual faculty is actually considerably imperfect (there

is in fact a large blind spot directly in front of us) and yet our brain takes the information it receives from our eyes and uses it to create a complete, three-dimensional picture. In a similar way, we often tend to put together fragmented and disjointed pieces of information, hearsays, and a variety of assumptions to construct our physical or religious models of reality.

For instance we believe in the existence of god, karma or reincarnation. These beliefs combine to create a highly pixilated picture that our brain then organizes into a coherent mental construct. The evolution of our civilization, culture and technology has always been tied to the evolution of our particular model of reality. An animal has a very simple model which reflects its basic need for survival and reproduction, but a human is much more complex. The question is: how can we know if our model is correct or which model better? The answer to this is not always clear. However, common sense would tell us that a better model simply fits more comfortably with what we see and experience, is more practical and allows us to reach a higher level of harmony with our physical and social environment.

In science, a good model of the physical universe is considered to be one which allows the most accurate predictions under given conditions, and one which can be proven to be true by mathematical calculations. There are many models of reality within physics. Some of them co-exist without conflict even though they point to different conclusions, particularly if they answer different questions or are applied to different means and ends. In addition, none of them necessarily offer the whole picture, but rather pertain to one facet in the prism of reality. For instance, while Newtonian physics is not complete, it is still the most useful theory in many of our day-to-day calculations; if an engineer constructs a building, he will apply Newtonian (classical) physics rather than quantum mechanics. On the other hand, quantum physics is needed in the development of nano-technology and modern computers. So the many branches of physics reflect different ways of looking at reality, but all fail to give us a complete picture of reality. This is why many scientists are searching for a unified 'theory of everything' which is commonly called the 'quantum theory of gravity'.

In our teaching we also speak about the need to have a correct spiritual vision of our evolution. Our spiritual vision is also a model of reality, one that reflects the spiritual laws of awakening and completion. Einstein said that a model has to be as simple as possible, but not more simple than that. To overly simplify any model, including our spiritual ones, is to render it infantile and false. For instance, Aristotle posited a model of the universe with the earth at its centre and all the

other stars and planets orbiting around it (now called the 'geocentric model'). The geocentric model was simple and even workable in many ways, but from a higher perspective it was simply wrong as it failed to correctly predict the planetary movements and various cosmic cycles. In a similar way, a spiritual model which assumes self-realization to be non-dual can be seen as satisfactory on a basic level, but it cannot satisfy the spiritual needs of a more mature soul who is searching to become whole. So our model of reality is evolving as our capacity to comprehend reality expands, and our imagination to see a wider view of our mysterious universe grows.

While no single model can be absolute and reflect a complete picture of reality, the more highly evolved the model is, the more closely it reflects the objective truth. This is particularly important to understand when building a spiritual vision of reality. Because spiritual truth is harder to experientially verify, spiritual models tend to be confined to 'pure thought' or idealistic constructs. Many of them are also conditioned by various religious dogmas. But as in science, the more objective and intelligent the spiritual model is, the more its applicability can be verified through our experiential reality. So, spiritual models need to evolve just as scientific models have, or they will tend away from truth and become instead a source of dogmatism and evolutionary stagnation.

Quantum Enigma

The birth of quantum physics sent a shock wave through the old model of classical physics and forced scientists to radically rethink their concept of reality from top to bottom. Even the greatest of scientists admit that they do not understand quantum theory. This is not only because it is counter-intuitive, but also because it defies many of the most fundamental principles of human logic. As we have touched on, quantum theory is the science of the subatomic reality, experienced on the micro scale. It is not the physics of objects or fields, but the study of their most elementary units or particles. There is an entirely different world existing on the subatomic level, like the world Alice discovers when she passes through the looking glass. This world is governed by completely different set of laws, laws which change our perception of the relationship between cause and effect, here and there, present and future. Quantum theory invites us to realize not only that things are not what they seem to be, but that they can be anything.

Wave-particle Duality: the Double Split Experiment

Some of the main principles of quantum theory can be demonstrated through the notion of wave-particle duality, which hinges around the fact that quantic entities such as photons (the subatomic components of light) seem to exhibit both particle and wave like properties. This cannot be explained within the confines of classical physics and hence, a new model – quantum physics – was required to account for and explain it. Einstein described the wave-particle duality in photons as a scientific contradiction, which required two separate and conflicting models of reality to be applied to the same phenomena in order to explain it.

One of the most famous experiments exploring the wave-particle conundrum is called the 'double slit experiment'. In the original version, a steady stream of photons was projected through a plate with two holes in it. Behind the plate was a screen which was designed to detect photons; when they hit it, they would illuminate it and create a certain pattern. If the photons were particles, they would create a particle-like pattern of dots on the screen, similar to if ping-pong balls or marbles were being projected through. If the photons were waves, they would create wide bands of interference on the screen.

The results of this experiment were surprising. Firstly, it was discovered that light indeed behaved as a wave, which in itself was not controversial. However, even when single photons where projected one after the other at intervals, leaving the projector as particles, they too would split at the hole, interfere with themselves, and create a wave-like pattern on the screen (one photon would passed through both slits). So it seemed, photons were both particles and waves. There was a further surprise. When a detection device was placed at the slits, the moment they were detected or observed, they would begin to behave as particles again, and create a particle-like pattern on the wall instead. They called this 'wave-function collapse'.

It is not that difficult to imagine that a photon can behave both as wave and as a particle, because in itself it is tricky to define. A photon has no rest mass, so it is not really an object. It is always in motion and therefore cannot be pinpointed in the way regular objects can. However, interestingly, the same double-slit experiment was later on performed with electrons. In classical physics, it has long been assumed that an electron was particle, and yet here it behaved just as the photon did: as both a wave and a particle. As with a photon, sending a single electron at a time made it split into two at the slit and produce the interference pattern.

Role of the Observer

The other key factor that came to light in the double slit experiment was the place of the observer in the experiment. As we said, scientists discovered through placing a detection device at the slit, that while unobserved electrons created an interference pattern on the wall, when they were observed, detected, they behaved as particles: 'wave function collapse'. This was a shocking realization. Until that point, scientists were completely fixed on the concept of 'pure observation', which validated the outcome of experiments, and rendered them free from various subjective interpretations. But now they were forced to realize that, on a quantum level, the very act of observation not only changes how we interpret an experiment, it can quite literally change its outcome.

There was another, further development of the double split experiment called the 'delayed choice' experiment. Here, the electrons were observed after they had passed through the slits and just before they hit the screen. What happened next is even more inexplicable: electrons which had split themselves to move through both slits (wave-like behavior) as if went back in time and started to behave as particles again, forming a particle-like pattern on the screen. In other words, the act of observation had as if changed the prior state of the electrons. The electrons had somehow changed their mind, 'gone back' to the slits and became particles instead of waves.

Predictability

Another surprising outcome of the double slit experiment was that scientists were unable to predict where the photons or electrons would end up on the screen. This is in conflict with classical physics, according to which we must be able to predict the future location of the electron if we have all the data about its present location. As scientists were contemplating these contradictions they realized that an electron does not possess the determinable reality of either a wave or a particle. Rather, it should be thought of as a 'wave of probability' which contains within it the mere potential of having one location or another. According to quantum mechanics then, we do not ask where the electron is now, but rather what the likelihood is of finding it in the particular part space which we are observing. In this way, quantum physics is probabilistic rather than deterministic: it looks at the likelihood of various particles behaving in a certain manner, rather than trying to precisely determine their future behavior.

Measurement Problem

The fact that when we look at it, an electron as if changes from wave to particle is called the 'quantum enigma'. One explanation for it, on a quantum scale, the measuring device is made from the same particles as that which is being measured: photons. In order to see anything, light is needed, and photons will interact with the observed subatomic entities as well, thereby changing their state. But this does not explain why those photons do not, for example, simply change the direction of the electron, but rather cause it to collapse into particle. The answer to this question has not yet been found. Because he did not like the implications of quantum theory, Einstein himself never fully accepted it, and called it incomplete. He said: 'I like to think that the moon is there even when I am not looking at it'. He also famously said 'god does not play dice with the universe,' in reference to the fact that quantum physics had to be probabilistic rather than deterministic. In response to this, quantum physicist Niels Bohr said: 'Albert, do not tell god what to do!'

In general terms, the outcome of double slit experiment demonstrates that quantum reality behaves in an apparently random way that cannot be reconciled with classical physics. In the classical theory, a successful observation permits a prediction of future events with ever-increasing accuracy, because it serves to improve our knowledge of the initial state of the system. When Galileo was experimenting with dropping a stone, he could safely expect that each time he did so, the result will be the same. In addition, the act of measuring those results would not change the outcome of the experiment. In quantum experiments, on the other hand, scientists can only compare the statistical data obtained in a given experiment, because even identical experiments will lead to different outcomes.

Quantum Tunneling

Another example of surprising quantum behavior is called 'quantum tunneling'. Quantum tunneling is when a particle 'tunnels' through a barrier that it, according to classical physical laws, should not be able to penetrate. For instance, if an electron is thrown against a wall, it might actually go through the wall even though it is not supposed to. One of the explanations for this is that electrons can borrow energy from their immediate the future, using it to bridge the barrier. They then 'pay the energy back' once they reach the other side. In another explanation, these electrons do not have to pass through the wall because they are already on the other side, according to the probability wave. In classical physics, if we role a ball up a hill, we know it will not be able roll over the hill without sufficient velocity – it will roll back down again. However, a

quantum wave-particle will actually go straight through the hill and arrive at the other side. As with the double slit experiment, quantum tunneling shows us the paradoxical nature of the quantum world which cannot be grasped by classical logic.

Uncertainty Principle: Certainty vs Probability

Another important concept of quantum theory is the 'uncertainty principle,' which was introduced by a physicist called Heisenberg in 1926. In classical physics, studying the behavior of a physical system is often a simple task due to the fact that several physical qualities can be measured simultaneously. But this is not the case with quantum physics. According to the uncertainty principle, we cannot know both the exact position and momentum of a particle at the same time. The more precisely the position of a particle is determined, the less precisely its momentum can be known, and vice versa. According to this, there is a fundamental uncertainty in all quantities that we wish to measure. We cannot precisely establish the location of quantum particles because of their wave-like nature and fuzzy, constantly shifting quality. So instead of trying to locate it, one particle can rather be seen to be in two or more locations simultaneously. According to the uncertainty principle, nothing can ever be located at a definite point because if it were, the uncertainty of its momentum would be infinite.

Entanglement: "Spooky Action at a Distance"

One of the strangest and, again, most important findings of quantum mechanics is that of 'entanglement.' When two particles are close enough to each other, they can become entangled, meaning their properties become linked. They then remain entangled and inextricably connected even if they are separated and sent in opposite directions. So a pair of entangled particles, once measured, always exhibit the same state in reverse, suggesting they can somehow communicate with each other across space. This 'uncanny instantaneous communication' is created even when entangled particles are separated by large distances. When the two particles are measured at two different locations, they seem to 'know' that they are being measured and also appear to communicate between each other instantaneously. When one is measured, the other responds in that very instant. This means that by measuring one of the entangled particles, we change the state of the other, as if the space between them did not exist. So for example, the moment one is measured to be spinning clockwise, the other will spin anticlockwise.

This again defies classical physics: Einstein, for instance, thought that a particle has a definite spin independent of our measurement. However, according to Niels Bohr, it is the act of measuring the particle that causes it to spin one way or the other. Here we can go more deeply into the measurement problem and the theory that quantum physicists have developed in order to account for it. Because the location of subatomic particles seems to be neither distinct nor predictable, and also subject to the uncertainty principle, quantum theory posits that particles have no fixed location or state prior to being identified and measured. We do not assume the particle to be in a fixable location prior to observing it, but rather assume it to be in all possible locations. Based on this, in the act of measuring any particle, we force it to relinquish all the possible places (or states) in which it *could have* been and select one definite location (or state) where we find it. For instance, before it is measured, a particle appears to spin both clockwise and anticlockwise *at the same time*. This is called 'superposition', according to which we do not know what the state of any object is, and therefore assume it to be in possible states simultaneously for as long as we do not observe it. It is the measurement itself that causes the object to be limited to a single possibility.

When two particles are brought together and create entanglement, the state of one begins to depend on the other. Therefore, by observing one of them, we can know the state of the other one even if it is in a distant galaxy. According to superposition, not only can we not know what the state of the particle is before looking at it, we should not assume it to have any properties at all before we measure it. What this means is that before we look, we cannot assume that one of the particles is spinning clockwise, and that the other one is doing the opposite. Rather, they are both in superposition, moving both clockwise and anticlockwise simultaneously. It is our act of measurement that fixes their reality: at that instant, we see one moving clockwise and assume the other is, at that same instant, doing the opposite.

Probability Wave

According to these laws, a quantum particle moving from point A to point B will take absolutely every possible path from A to B *at the same time*. This includes paths that involve highly improbable events which in classical physics would be discarded. The question is, how do we move from this 'probability wave' of infinite possibilities to a definite, empirical reality? According to quantum physics, while each particle contains the probability of being found anywhere in the universe, it will still most likely be found within the range of what we are looking

for. After repeating experiments many times, the frequency of various outcomes does conform to certain predicted probabilities. So for example, even though a single electron can go through two slits at the same time, and there is no way that we can really tell where the electron is going to end up, we know where it might and might not end up. While we cannot predict its final destination, we can suggest a probability distribution – a range of less and more likely outcomes.

So quantum physics basically predicts the probability of how things are going to happen on the micro-scale, and it does predict them with great accuracy. It is essential to understand that the model of probability in quantum physics is not a reflection of having insufficient data to predict a final outcome. Rather, it is a reflection of the behavior of particles on the subatomic level, and the fundamental randomness in nature. In the double spit experiment, a particle is seen to have no definite position between its start and endpoint. This is not because the particles take no path, but because they take all paths simultaneously to arrive at their destination.

Implications of Quantum Theory

Quantum theory may seem nonsensical or mystical, but it has been confirmed by countless experiments and mathematical calculations. It has been rigorously tested, and has brought tremendous changes to society through its technological applications. None of the electronic gadgets or computer chips would run without quantum physics. In fact, without quantum mechanics we would go back to the time of steam engines. Even though this theory challenges many of the orthodox views, the bedrock principles of physics are still intact: energy is still conserved, entropy still increases, nothing can move faster than the speed of light.

Many-Worlds Theory

One extrapolation of quantum theory is what is called the 'many world' hypothesis, where all the possibilities and choices we make are happening simultaneously but in other parallel universes. While this concept helps us to go beyond the contradictions of a theory of probability, it falls rather flat and is overly deterministic. If we posit that all options will happen anyway, there is no place for free will or a true spirit of creativity.

In a similar way, quantum theory has been applied to the history of the world, the idea is that there is not just one, linear narrative of history. Rather, our present universe is one of an infinite

possible outcomes or narratives. This is called 'multiple histories' theory. In this case, what has happened to the other histories? Some scientists have come to believe in a multi-universe, into which all possible histories could have branched out. This means that all these possible histories have actually happened, but not to us – they have manifested in other universes. So according to the multi-universe concept, the electron in the double split experiment ends up in one place in our universe, but also in all the other possible places in other, parallel universes.

The concept of many-worlds may appear convincing to the mind which struggles with contradiction and paradox, but it is based on false logic, one that is not in touch with the principle of free will and evolution. If the consequences of our potential choices will happen anyway, what is the point of making them? This philosophy is another form of determinism created by the rigid mind disconnected from the living universe.

These kinds of ideas are created by the mind and are not in touch with our higher purpose, which is realization of our pure nature. Overall, physics shows an excessive concern with prediction, as if universe was a mere equation in the scientist's own mind. Psychics try to predict future through their imagination or through divination, and scientists do the same with their numbers and statistics. But can we really predict future? It is by nature unpredictable, and anything can happen. To avoid this 'uncertainty' using many worlds theory is really to miss the point of our fundamental purpose.

Looking for the Missing Pieces

Scientists realize more and more that there are many pieces of reality that have not been taken into the equation in our model of reality. For instance, to explain our universe on the astronomical scale, we must also consider the presence of dark matter, dark energy (responsible for expansion of the universe), various anti-particles and other components of matter and energy (known as anti-matter). An understanding of the physical plane needs to include these elements. Indeed, dark matter is meant to constitute a staggering 85% of the gravitational mass in the universe. According to the standard model of cosmology, the total mass-energy of the known universe contains 4.9% ordinary matter, 26.8% dark matter and 68.3% dark energy.

What is dark matter made of? No one actually knows. It is not made of protons and electrons. It was once posited to be made of neutrinos, particles which are a thousand times smaller than

electrons, but more recently it has been claimed that it is made of other, unknown subatomic particles called 'wimp': weakly interacting massive particles. But no one has ever seem a 'wimp'. Perhaps a wimp is not even 'something' that we cannot see, but rather 'somewhere else', in another dimension that is somehow interwoven with our reality. By developing sophisticated measurement tools, we have been able to identify many of particles in the subatomic world. But it seems there are more and more to come. Our picture of the physical world can perhaps never be complete, because it is infinitely complex.

String Theory

Another outshoot of quantum theory is string theory, which posits that the smallest particles in the universe are not atoms, electrons, protons, neutrons, quarks or even neutrinos, but something entirely else: strings. Superstring theory is one of the more well known schools, one that strives to complement quantum theory. But no one has yet managed to probe empirically into any unit that is smaller than the elementary particles inside the atom. It is said that to see an actual string we would have to scale an atom to the size of our whole universe. On that scale, a string would as big as the average tree.

According to string theory, particles are not points but patterns of vibration that have length but no height or width, like infinitely thin pieces of string. They are imagined as one-dimensional slices of a two-dimensional membrane vibrating in an 11-dimensional space. Because we do not have enough data to explain the universe, scientists are using imagination and mathematics instead to predict what is missing. So for instance, according to string theory, we need more than 4 dimensions to explain reality. In addition to the 3 dimensions of space and the dimension of time, 7 more dimensions have been added in M-string theory. Where are these dimensions if we cannot see them? They are curled up and extremely small, too small to be visible. Additionally, based on the concept of supersymmetry, each particle is supposed to have a counter-particle or 'superpartners' which they call 'sparticles'. The problem with string theory, like many-worlds theory, is that the line between a highly constructive scientific imagination and actual science fiction becomes blurry. Since these concepts have not been proven, they maybe no more than a fanciful extension of someone's belief system.

Spiritual Interpretation of Quantum Paradox

In spite of being so hard to understand, quantum theory has managed been very well infused into the collective consciousness. For instance, we use the word 'quantum' to refer to a special or extraordinary thing or event. We use the term 'quantum leap' without knowing that it is originally a scientific term describing the instantaneous shift of an electron from one orbit to another. It is also common to interpret the concepts of quantum physics in a mystical way: things can be in all places at the same time, events can be simultaneously present past and future, we are not really making choices because we make all the possible choices but in different universes. However, the real question remains: how do discoveries of the paradoxical nature of the microscopic world change our overall picture of reality?

The first thing that we need to clearly understand is that reality is much more complex that the linear, common-sense mind can ever imagine. It is more complex, but this does not necessarily mean it is irrational or disordered. A photograph is composed of thousands and thousands of pixels, but within that our mind still can decipher precise objects, colors and details. We could say that reality is a type of organized chaos. And certainly, no matter how chaotic the world is on the subatomic level, the bigger picture in which we live and function appears to be much more orderly. As we noted, physicists have found no clear relationship between the quantum world and larger, living world. Perhaps there is no line that separates them, because there is an actual quantum leap between quantum 'chaos' and classical order.

The Law of Organization

The fact that there is less precision and more unpredictability on the micro scale tell us that the subatomic world is still not organized. It was actually quite gratuitous of scientists to expect that an isolated particle such as an electron would behave according to their expectations and obey the laws they created for bigger and more complex matter. The quantum reality is a complicated network of elementary forces, whose purpose is to create the larger structures of the physical universe. The moment we extract one of these forces from the larger context, we capture it in-between, before it has become coherently organized or structured. As particles begin to form atoms, atoms form molecules, and molecules from various chemicals, objects and larger masses, their behavior becomes less chaotic and more in accordance with the laws that govern the universe on a bigger scale.

The boundary between the micro and macro world is fluid, but its existence cannot really be denied. Atoms seem to seek to form larger structures, so that they can serve the very purpose of life. We could hypothesize that, when we isolate atoms from these larger structures, they return to the state of seeking, trying to become part of the bigger picture. They can be in two places at the same time, they can behave as waves or as particles, they can communicate over large distances. They must have all these extraordinary abilities so that they are fit to enable organization of the universe. They are not passively obeying the physical laws – they are actively creating the foundation of these laws. When we look at a tree, enjoying the comfort of knowing that it will be there the next day, in the same place and that it will grow a little taller each year – it is all the organized atoms inside this tree that make this stability and predictability possible.

The question that still puzzles physicists is whether the 'fuzzy' nature of the quantum world is somehow secretly present in our ordinary world too, but on this scale, we just fail to register it? They have concluded that it is almost certain that some elements of quantum instability can be found on the macro scale, but even then they behave in a more orderly fashion. As we noted, the world we are living in can be seen as a tamed chaos, an organized chaos, a chaos with purpose and clear direction. And after all, this realm of organized chaos is the very place where our soul has chosen to awaken the true, inner order of the spiritual realm.

The Law of Probability and Freedom of Evolution

It has been shocking and also humbling for scientists to realize that they cannot fully predict events in time and space. Nature is humbling humanity in many ways, and quantum theory has in certain ways served as a scientific confirmation of our insecurity and uncertainty about the world. On the micro scale, we can only offer probable outcomes rather than predictions or certainties, because we do not fully understand why particles behave the way they do. If we can go deeper into this uncertainty, we realize something very important: that uncertainty is necessarily embedded in the fabric of life – nature must have certain freedom of choice. On one level it obeys some absolute law, but on another level it reflects the very free and creative process of existence. So within the basic laws of the universe, there is an inherent space for the unknown. Nature is finding its own way. This becomes more apparent when we look into the mysteries of the subatomic world, but it can be also observed on a larger scale.

Without probability there is no freedom. In conditions of absolute certainty there would be no creativity and free will. Some people imagine the universe as a big machine, the future of which is predetermined by the very laws that govern it. But to live inside a machine, as a miniscule part of that machine, is to be a robot. We are not robots and our universe is not a mechanical contraption. We live in a living world. And already on the subatomic level, nature is making choices, using its free will for the higher purpose of birthing the universe, intelligence and consciousness.

Because we are also made of atoms, we are part of this probabilistic world, and we are making choices to manifest the best outcome. There is no such a thing as fate; there is only the wisdom of life that seeks to reveal our higher destiny. So reality is not determined, and many outcomes are possible. When an awareness of this probability reaches the conscious mind, this is the beginning of free will. In addition, because no one can be sure of arriving at their spiritual destination, walking the inner path is also governed by the principle of uncertainty. The presence of spiritual uncertainty is requisite to form an environment where free will can exist, which in turn is needed to enable us to take responsibility for our existence in time. No free will is equal to no responsibility. No responsibility is equal to no conscious relationship of cooperation with our destiny. We live in uncertainty that is constantly balanced by the increasing probability of finding our way in this magical universe. The more conscious we become, the more in touch with our free will, the more true to our higher intuition, and the more sensitive in reading the signposts of our existence, the higher the probability of fulfilling our ultimate destiny becomes. When one agrees to live in the unconscious construct of the collective mind, the probability that one will reach spiritual actualization is very small, for one are not in touch with free will. When one follows the spiritual path in an unintelligent way, getting lost in the wilderness of unconscious spirituality, one's probability to find true peace is perhaps even smaller because one has begun to use one's free will in the wrong way. In the human world, similarly to world of particles, each atom must find its way or else it will be recycled in the universal caldron of energy. Taking responsibility for increasing the probability of our spiritual actualization is the very thing that makes us human and differentiates us from the astounding yet unconscious intelligence of elementary particles.

Quantum Theory of the Mind

When we look at the subconscious mind, each thought, on a very subconscious ('subatomic') level, takes all the paths in the brain. However, the more it is linked to consciousness, the more

only our preferred choices are made. What is a thought? Is it a form of consciousness? It is a form of consciousness, because it is linked to the sense of me. A thought is information that has reached the threshold of me. On the unconscious level of, for instance, matter and energy, there is information but there is no me, hence there is no thinking. Every thought is information, but not all information is a thought. A computer is processing endless bits of information but it is not thinking because it has no sense of me. Where exactly does information become a thought? There is a moment deep in the subconscious when information experiences a quantum leap into thought. In other words, information moves out from the unconscious state into the subconscious. Since there are many layers of the subconscious, this moment is not easy to define or recognize. In fact, it is a quantum leap because there is no spatial gradation between the unconscious and subconscious, no in-between. There are no levels in being unconscious; there are only levels in being subconscious and then conscious.

Thinking on a very subconscious scale is disorganized. Not only do we not recognize that we are thinking (meaning thinking does not know that it is thinking), but thoughts happen in a random, often chaotic manner, trying instinctively to formulate a mental structure. This is indeed the quantum world of the mind. If we could install a measuring device in the dark cave of the subconscious, we would see clearly how fuzzy it is, just like the subatomic world. Attempts have been made, by for instance Freud and Jung, to analyze the subconscious mind. But what they were studying was the further development of the subconscious, one that is already knocking at the door of the conscious mind. No one could really analyze the disordered sphere at which the first birth of a thought occurs. We could call this area of the mind the 'base-subconscious', for it is the true foundation of the complex structure of our holistic subconscious mind.

When does a subconscious thought becomes conscious? Is there also a quantum leap from the subconscious to the conscious mind? Unlike the jump from the unconscious to the subconscious realm, evolution into conscious thinking is gradual. It is so gradual that we could probably draw a whole map of the long journey of consciousness into self-reflection and self-awareness. Even when you observe yourself on daily basis, you can sometimes be uncertain whether you have been thinking consciously or subconsciously. In fact, you were probably somewhere in-between. There is no clear line in between the two, and thinking can be less and less subconscious and more and more conscious. On the extremes of the spectrum, we can clearly recognize when our thoughts are fully conscious, or fully subconscious. For instance, when you daydream in meditation and then come back to yourself, you know for certain that you were lost in your

subconscious. Similarly, when you think very consciously, you can have no doubt that you were present in the act of thinking.

These contemplations begin to go beyond the scope of this article, but what they illustrate is the intricate process of mental organization, where the quantum-like behavior of the subconscious is transformed into the higher structure of the conscious mind. Similarly to the workings of nature, where the quantum reality is present but hidden in our everyday physical existence, the quantum reality of the mind is also present beneath its conscious processes. After all, the subconscious is the existential base for the conscious mind. However, in this case the relationship is mutual, and feedback from the conscious mind exerts a profound effect on the subconscious. This means that not only is the mind evolving from its base-subconscious to consciousness, but our conscious feedback touches the deep layers of the subconscious, bringing order into inherently disordered mental states. This is not to say that our base-subconscious is brought to the threshold of the conscious mind, which would in fact be detrimental to some very delicate processing of information on the subconscious level. Rather, it is indirectly transformed by being linked to our conscious intelligence. For such a transformation to occur on substantial level, however, it is not enough to develop the faculty of conscious thinking. We must awaken our higher subjectivity as a whole, and channel the energy of recognition into the constant embodiment of our pure nature.

Quantum Gravity of Pure Subjectivity

These days many physicists are trying to unify and reconcile quantum theory with general relativity in order to create what they call a 'quantum theory of gravity', sometimes referred to as a 'theory of everything'. Quantum physics takes into account three fundamental forces: strong force (the one that keeps the nucleus or core of the atom together), weak force (responsible for radioactive decay of subatomic particles) and electromagnetic force (responsible for the interaction between electrically charged particles) The fourth fundamental force, gravity, has so far been omitted in quantum physics because it does not really apply to reality on a micro scale. This is because gravity is incomparably weaker than the other three forces, and as such hardly noticeable on a subatomic level. It is only on a macro scale that we begin to notice how gravity affects our reality, because the force of gravity is accumulative: the bigger the mass is, the bigger the force of gravity is, and it can grow infinitely. This is why gravity is so important in general relativity: on a very large scale, it is much stronger than the other forces. The idea behind the concept of 'quantum gravity' then, is to find a common ground in the laws that govern both the subatomic world and the larger universe, and a theory which can encompass both.

So far no one has succeeded in this task, but the concept of quantum gravity does make a lot of sense. For our purposes though, can we use the concept of quantum gravity in our contemplations of our inner evolution? It is important to emphasize that we are not looking to draw direct parallels here between the physical and spiritual realms here. We are simply creatively using the knowledge of the deeper physical laws to deepen our understanding of the spiritual dimension.

Are there any spiritual teachings that appear to resonate with some of the discoveries of quantum theory? Some parallels can be perceived in various traditions, but they are most apparent in Shaivism. In Shaivism, existence is conceptualized as a cosmic vibration or pulsation, 'spanda', of Shiva. Spanda is "the scintillating pulse of the supreme light which continuously trembles within its own incandescence". It is this vibration which makes up the totality of all beings. Thus the universal spanda blissfully vibrates as all aspects of the universal self. This vibration is not dissimilar to the electromagnetic radiation of photons (light) or even deeper, as the dynamic pulsation of the subatomic world experienced on the level of phenomenal reality and consciousness. In Shaivism these two are seen as a unified field of reality.

On the other hand, most teachings on the subject of awakening (with the exception of Taoism and Zen) do not contain the energy of gravity because they are not in touch with the gravitational force of the source. They are floating up in space, and lack a basic grounding in reality. This includes Shaivism. If gravity is not taken into our spiritual equation, even if we gain insight into the dynamic or vibrating nature of existence, we remain disconnected from the most important force in the inner realm – the pull of the source.

How does gravity enter the picture of our inner reality? Here, unfortunately, the principles of physical gravity are not sufficient to help us understand the inner realm. Gravity is essentially the law of attraction. It is different to magnetic attraction (where a positive and negative charge will attract each other) because in the case of gravity, attraction is a function of a mass. The gravitational field surrounding any object extends infinitely in all directions; so every particle in the entire universe is gravitationally attracted to every other particle. One mass attracts another mass, and the bigger the mass, the more powerful its gravity is. For instance, the earth's gravity is stronger than the gravity of our body, even though our body is also exerting a gravitational force upon the earth (our body pulls the earth towards itself). However, in spite of being one of the most elaborated concepts in physics, no one is really sure what this gravitational force actually is. In fact, according to Einstein, gravity is not a force at all but a curvature of space-time that

happens in the proximity of objects with mass. For instance, a satellite that orbits the earth is actually travelling in a straight line; its orbit is curved because of earth's gravity.

So what causes gravitational attraction between objects? It is possible that the secret of gravity is hidden in the strong force that hold quarks (the building blocks of protons and neutrons) together in the nucleus (the core of the atom). Scientists have hypothesized that a nucleus emanates gravitons, which are comparable to photons – they are the particles of gravity. These gravitons are emitted into the more external spheres of the atom, while its essential force is pulling energy into itself. Each graviton is considered to have a very weak force. The reason the gravity of earth is very substantial is because it is made from an enormous field of gravitons. And yet, it is still so small: the smallest of magnets can lift up a metal pin, even though it is subject to the gravity of the whole earth.

The seeming weakness of a graviton could potentially be explained by going deeper into the core of the nucleus. From a spiritual perspective, we can propose an interesting idea: that at the very heart nucleus, there is a wormhole leading to the inner universe, the realm of absence. If this was the case, the gravitational force inside a nucleus would actually be enormous, but it would appear weak because it connects very weakly to the physical universe. In this model, we can say that the gravitational pull of the source emanates clouds of gravitons into this plane from within each nucleus, in order to allow the attraction between physical bodies, and ensure that the world is properly organized. This could also explain why no one can actually see gravitons: because their essence it is not here. The presence of gravitons is a kind of anti-presence that constantly self-annihilates in absence. So within this vision of the atom, its nucleus is in fact a doorway to absence. In this sense, physical gravity can be regarded as a pale reflection of the vast inner gravity that constitutes our connection to the source.

Spiritual gravity is much deeper than physical gravity. It is rooted in the dimension of conscious absence, the original void of being that timelessly dwells at the foundation of manifested reality. What this means is that we can understand the principle of spiritual gravity only in the context of surrender, absorption and transcendence. This is how we finally find the balance between the quantum world of our spiritual energy, and the fundamental force of inner gravity.

From a spiritual perspective, there are many strong forces at play as we live in manifested reality, but the gravity of the source is very weak. If there is a strong force of attraction in this plane, it is the pull of unconsciousness: the bigger masses of unconsciousness are attracting the smaller

masses of unconsciousness. The energy of existential inertia and spiritual lethargy is what assures the eternal continuance of ignorance. Even though we could speak about the gravity of consciousness as an actual force in the dimension of presence, unless it is rooted in absence, that is in itself it is rather insignificant. At best, the gravity of consciousness serves as a counter-force against the gravity of unconsciousness. The gravity of consciousness is activated by solidifying the mass of me. However, putting aside these speculations, we can come back to our main point: true gravity is the force of the source exerted upon the manifested reality.

We might ask a question, why is the whole of existence not in samadhi if the absolute is the ultimate force of gravity? This is the specific design of creation. Firstly, the nature of unconsciousness counteracts the pull of the absolute, by propelling energy in the opposite direction. Secondly, there is an inner law which states that only a truly solidified me can enter the absolute without becoming annihilated. Hence, we need to reach a high level of evolution on the level of our me in order to pass the threshold of absence and become one with the gravitational force of the source. The crucial thing to understand is that unlike gravity in nature, which is insentient, the gravity of the absolute has intelligence. This enables it to be in a conscious relationship with any soul who enters its sphere. The absolute must actually allow each soul to cross over into the dimension of absence, which is what we call grace. However, for grace to possible, the soul has to first embody her subjectivity and only then begin the process of vertical surrender.

We could describe spiritual 'quantum gravity' as a transfiguration of the subatomic particles of the inner states, combined with arriving at the condition of absence or absorption in universal gravity. The body of the soul is made of energy, and even consciousness possesses an energetic dimension. So the spiritual path must include direct work with our energetic transformation and alignment. This is spiritual quantum theory in action. As an example, when you sit in meditation and dwell in conscious me and pure me, you are facing the energetic dimension of the mind and consciousness on many levels. You must transmute any fluctuations or energetic disalignment into pure light, energy that is compatible with the principles of our higher subjectivity and the natural state. This is done by embodying your light, surrendering to universal reality and letting go of any identification with the relative dimensions of the mind.

This is just one example of our energetic work. What we need to understand is that not only our physical body is made from subatomic particles, our spiritual body is too. Our energy states actually need to be transformed on a quantum level in order to serve as a proper container for our

pure subjectivity. On the other hand, gravity is our connection to universal subjectivity, the force linking us with transcendence and ultimate grounding in the source of creation.

The Principle of Totality

A theory of 'spiritual quantum gravity' is not only a holistic description of our inner reality, but a representation of our evolutionary processes as we grow into the ultimate state of wholeness. We must always strive to see the bigger picture and not get stuck in relative models or theories of our inner reality. There are many viewpoints on the spiritual path and even though some of them are valid, in isolation from the larger picture of wholeness and completion, they may lead us astray. Searching for a higher vision of reality is an attribute of being conscious and connected to universal intelligence. To become a vehicle of this continuous revelation is the very reason for our existence. This article has intended to take us one step further in the awakening of our higher imagination, through which we can imagine the unimaginable and in doing so, cause it to become real.

The insight into the complex and rich subatomic world helps us to become conscious of one more dimension of our reality. Totality is the unity all dimensions: the micro world, the macro world and the transcendental world. To create a deeper relationship with the subatomic world of our existence can be profoundly inspiring, and serve to deepen our awakening. Seeing our life from the place of quantum world, experienced from samadhi in the inner plane adds another level of unity or totality to our soul. If one is able to activate a deeper insight into the subatomic world, one can directly experience it as the energetic base of the physical body and the spiritual self. In this way, one can clearly experience one's ordinary life from the conscious unity with quantum world. This is true meaning of totality.

Blessings,
Anadi

For a full glossary of terminology, please visit our website: anaditeaching.com/glossary