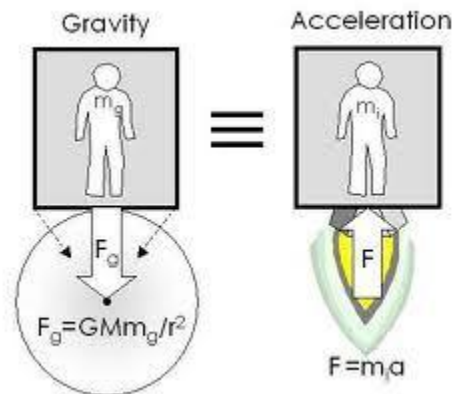


Why Physicists Cannot Take the Observer Out Of Physics

Physicists are obsessed with the idea of taking the observer out of physics. They want to assume that reality only consists of the physical world and that the consciousness of a person that observes that physical world only emerges in that world when a physical person comes into existence in that world. This mistaken idea is just flat-out wrong. This mistaken idea denies the independent reality of consciousness, which must exist prior to the apparent existence of the perceived physical world. It is a logical impossibility that a physical world can appear to exist if it is not being perceived by an observer.

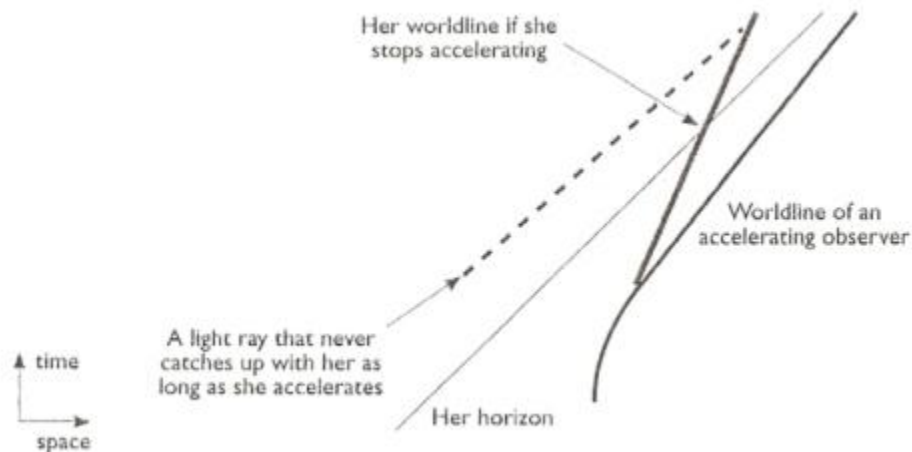
It is a logical contradiction to assume that a physical world can appear to exist if it is not being perceived by an observer. The origins of these logical contradictions are baked right into the fundamental assumptions of modern theoretical physics. In relativity theory, the whole idea of the nature of gravity is based on the idea of an observer in an accelerated frame of reference. Only an accelerating observer observes the effects of gravity, which are a consequence of the dynamical curvature of the space-time geometry that arises in that accelerated frame of reference. This fundamental idea is called the principle of equivalence, which states that the effects of gravity perceived by an observer are always equivalent to the observer's own accelerated motion.



Principle of Equivalence

As a logical corollary to the principle of equivalence, it is a well known fact that every accelerating observer has its observations of events in space limited by an event horizon that arises in the dynamically curved space-time geometry of its accelerated frame of reference. The observer's event horizon is a two dimensional bounding surface of space that limits the observer's observation of events in three dimensional space due to the limitation of the speed of light as the maximal rate with which information can be transmitted through three dimensional space as the observer follows an accelerating world-line through that three dimensional space. A light ray that originates on the other side of the observer's event horizon can never reach the observer as long as the

observer continues its accelerated motion. In the generic case this effect is called a Rindler event horizon, but there are other examples of event horizons, such as the event horizon of a black hole and the cosmic horizon of an observer at the central point of view that arises in de Sitter space with the accelerated expansion of space.



Accelerating Observer's Event Horizon

At this point, it becomes necessary to discuss the fundamental assumptions of quantum theory. It is usually assumed that the quantum state of the physical world is described by a wave-function, but this is a mistaken idea. A wave-function, $\psi(x,t)$, can only give a description of point particles that appear to exist in the physical world. A fundamental assumption of quantum theory, which is called the measurement problem of quantum theory, states that the wave-function only specifies the quantum probability with which a point particle can be measured at position x at time t . The wave-function is only a probability amplitude that specifies the quantum probability with which a point particle can be measured at a point in space at some moment of time. For example, Maxwell's equations for the electromagnetic field are the wave equations for the wave-function that species the quantum probability that the point particle called the photon can be measured at some point in space and time, and Dirac's equations for the spinor electron field are the wave equations for the wave-function that species the quantum probability that the point particle called the electron can be measured at a point in space and time.

The big problem is defining the nature of that space and time. In relativity theory, we can only speak of the dynamically curved space-time geometry that arises in an observer's accelerated frame of reference. That's the inherent nature of gravity. It makes no sense to discuss the nature of space and time without an accelerating observer that observes the gravitational effects of its own dynamically curved space-time geometry. In relativity theory, that dynamically curved space-time geometry is described by Einstein's field

equations for the gravitational space-time metric, which are analogous to Maxwell's equations for the electromagnetic field. The space-time metric is the gravitational field that measures the curvature of space-time geometry, but that space-time curvature is always equivalent to an observer's own accelerated motion. It makes no sense to discuss the perceived effects of gravity without an observer that perceives the effects of gravity in its own accelerated frame of reference.

The basic problem with the current understanding of quantum theory is that physicists are mistakenly assuming that quantum theory can only be understood in terms of quantum field theory, which is inherently a wave-function description that can only give rise to a point particle interpretation of quantum theory. If Einstein's field equations for the gravitational space-time metric could be interpreted as a quantum field theory the same way that Maxwell's equations for the electromagnetic field can be interpreted as a quantum field theory, then the space-time metric would be the wave-function that specifies the quantum probability that a point particle called the graviton could be measured at a point in space and time analogous to how the electromagnetic field is a wave-function that specifies the quantum probability that the point particle called the photon can be measured at a point in space and time.

There are some big problems when we try to interpret Einstein's field equations for the gravitational space-time metric as a wave-function in much the same way that Maxwell's equations for the electromagnetic field are interpreted as a wave-function in quantum field theory. By its very nature, gravity is described by a dynamically curved space-time geometry as formulated in terms of Einstein's field equations for the space-time metric. In the sense of quantum field theory, which describes the motion of point particles, Einstein's field equations are the wave equations for the massless spin 2 graviton, analogous to Maxwell's field equations for the massless spin 1 photon. However, there are a bunch of big problems when we try to conceptualize how we would measure the location of the graviton as a point particle in some coordinate system. The first problem is defining that coordinate system. That coordinate system is always a representation of an observer's frame of reference. Quantum field theory, as a formulation of the motion of point particles in a coordinate system, can only be defined in the flat gravity-free Minkowski space of special relativity, which implies no acceleration by the observer. By its very nature, gravity is only describable in terms of a dynamically curved space-time geometry, which is always equivalent to an accelerating observer's frame of reference, and so to consider the graviton as a point particle propagating through flat gravity-free Minkowski space is a logical contradiction. Either the observer undergoes acceleration motion or the observer doesn't accelerate, but you can't have it both ways.

The second problem has to do with the nature of black holes and what can actually be measured. It turns out that it's logically impossible to measure the position of the graviton as a point particle in some coordinate system due to the nature of black holes.

This has to do with the problem of a smallest possible distance scale that can be measured, called the Planck length, which arises when the general relativity of gravity is combined with basic notions of quantum theory. It's actually quite easy to calculate this smallest possible measurable distance scale using the basic idea of the event horizon of a black hole.



A black hole is characterized by an event horizon, which is a boundary in space beyond which nothing is observable. At the event horizon of a black hole, escape velocity is the speed of light, and since nothing can travel faster than the speed of light in three dimensional space, nothing is observable beyond the limits of the two dimensional boundary of the event horizon, where the force of gravity is so strong that even light cannot escape from the black hole. It's easy to calculate the radius of the event horizon using ordinary concepts of classical physics. Escape velocity is defined when a particle has just enough kinetic energy that it can overcome the attractive force of gravity. A classical particle of mass m that moves with a velocity v and is located at a radius R from the central point of a larger mass M that generates a gravitational field has a total energy that's given in terms of these parameters as $E = \frac{1}{2}mv^2 - GMm/R$. The minus sign indicates that gravity is an attractive force. With escape velocity, the particle has just enough kinetic energy of motion to overcome this gravitational attraction, and eventually escapes away to infinity, at which point it stops moving. This specifies the particle's escape velocity in terms of a zero total energy, $E=0$, which gives it an escape velocity of $v^2 = 2GM/R$. The event horizon of a black hole is a two dimensional surface of space surrounding the mass M within which nothing can escape away from the black hole, which means escape velocity at the event horizon is the speed of light, $v=c$. This gives the radius of the event horizon in terms of the mass of the black hole as $R = 2GM/c^2$.

$$R = \frac{2GM}{c^2}$$

Schwarzschild Radius of a Black Hole

With the radius of the event horizon of a black hole and some basic notions of quantum theory, we can now calculate the smallest possible measurable distance scale, which is called the Planck length. The way we measure the size of an object is by scattering light off the object. To measure the size of a smaller object, we have to use light that has a smaller wavelength. We can use visible light in an ordinary microscope to measure the size of a bacterium, but to measure the size of a virus, we have to use x-rays in an electron microscope, which have a smaller wavelength. When we measure the size of an object, we are literally scattering photons off the object. In quantum theory, the energy of a photon is related to the frequency of its wave vibrations, $E=hf$, and since the frequency is given in terms of the speed of light and its wavelength as $f=c/\lambda$, the energy of the photon is given in terms of its wavelength as $E=hf=hc/\lambda$. This means to measure the size of a smaller object, we have to use light that has a smaller wavelength and a higher energy. As we measure smaller and smaller objects, we eventually concentrate so much energy into such a small region of space that we create a black hole. The mass of the black hole is determined in terms of the energy of the photon that we have to use to measure the size of the object, $E=Mc^2=hc/\lambda$. The distance scale at which the black hole forms is called the Planck length, ℓ . If we set this distance scale equal to both the radius of the event horizon of the black hole and the wavelength of the photon that is scattered off the object as $\ell=R=\lambda$, and use $R=2GM/c^2$, then $\ell=R=2GM/c^2=2hG/\lambda c^3$, and with $\ell=\lambda$, we arrive at the final result that $\ell=2hG/\ell c^3$, which is the distance scale at which the black hole must form. The Planck length is defined as $\ell^2=\hbar G/c^3$.

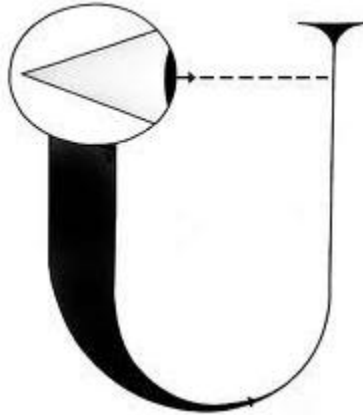
$$\ell_p = \sqrt{\frac{\hbar G}{c^3}} \sim 1.6 \times 10^{-35} \text{ m}$$

Planck Length

There is an ultimate distance scale that we can measure, called the Planck length. If we try to measure an object smaller than a Planck length, we have to concentrate so much energy into such a small region of space that we create a black hole, and then we can measure nothing beyond the limits of its event horizon. This is why we cannot measure a graviton as a point particle. If we try to measure a graviton as a point particle, we only end up creating a Planck-size black hole, and then we can measure nothing beyond its event horizon. It seems relativity theory forbids the measurement of a graviton as a point particle, which is another way of saying that there is no such thing as a point particle or graviton formulation of gravity. Gravity cannot be understood as a quantum

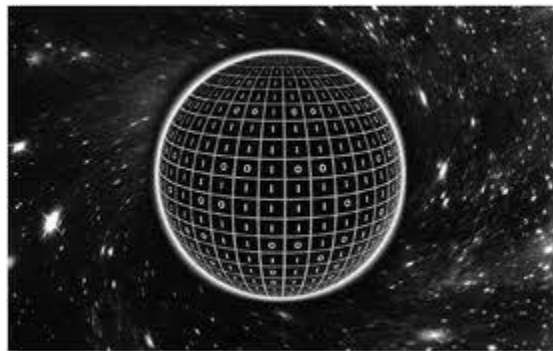
field theory since that is inherently a point particle formulation. It is impossible to quantize Einstein's field equations for the space-time metric as a quantum field theory.

What is the solution for this problem? The answer of course is the holographic principle. Gravity can only be quantized when an observer, which is the perceiving consciousness present at the central point of view of its own holographic world, enters into an accelerated frame of reference, within which its event horizon arises that becomes the observer's holographic screen when its horizon encodes qubits of information.



Universal Observer

The holographic principle tells us that all the qubits of information that give rise to the gravitational field of a black hole are encoded on the event horizon of the black hole. The smallest possible black hole is a Planck-size black hole that encodes a single qubit of information. This explains how information is encoded in quantum gravity. A Planck area defined on an accelerating observer's event horizon is the quantum of space-time geometry, and a qubit is the quantum of information.



Black Hole Information

The holographic principle tells us that the quantum state of the physical world cannot be formulated in terms of a wave-function. A wave-function, in the sense of quantum field theory, $\psi(x,t)$, can only describe the dynamical behavior of point particles that appear to exist within the space-time geometry of a world. Those point particles appear to be located at positions in space at moments in time and to move through space over the course of time. The very nature of a wave-function, $\psi(x,t)$, as a probability amplitude that specifies the quantum probability that a point particle can be localized at a position x in space at a moment t in time tells us that the wave-function can never describe the space-time geometry of that world or its dynamical curvature in the sense of gravity. It is simply impossible to formulate the space-time geometry of a world or its dynamical gravitational curvature in terms of a wave-function or a quantum field theory.

If a wave-function cannot represent the quantum state of a physical world, then how is that quantum state formulated? The answer is the holographic principle. The quantum state of the world is defined on an observer's holographic screen. The observer can only perceive its own holographic world when the observer enters into an accelerated frame of reference. The accelerating observer's holographic screen arises as its event horizon in its own accelerated frame of reference. The accelerating observer's event horizon becomes its holographic screen when its horizon encodes qubits of information.

This is the fundamental reason why the observer cannot be taken out of physics. The quantum state of a holographic world that is perceived by an accelerating observer is always defined on its own holographic screen that arises as its event horizon due to its own accelerated motion. The observer's event horizon becomes its holographic screen when its event horizon encodes qubits of information. That's how the quantum state of the observer's physical world is defined. The observer's physical world is a holographic world defined on its event horizon due to its own accelerated motion. That holographic world only appears to come into existence from the observer's own point of view due to its own accelerated motion. Before that accelerated motion can occur, the observer must exist. We have to begin with the existence of an observer before we can even discuss the nature of the holographic world that it perceives. The observer must come first, before the world that it perceives can even appear to come into existence. The observer must have its own independent existence. The observer's existence must be independent of and prior to the apparent existence of the holographic world it perceives.

The Mysteries of Quantum Theory are the Mysteries of Nonduality

There are a number of mysteries about quantum theory that have perplexed the greatest minds of our scientific age, but once you understand what the holographic principle of quantum gravity is telling us about the nature of reality, these mysteries are not really that mysterious. Although not fully appreciated by either the scientific or nonduality communities, the holographic principle also allows for a scientific

understanding of the nature of nonduality, which is another way of saying that the mysteries of nonduality are the mysteries of quantum theory.

What exactly are these mysteries?

The first mystery can succinctly be stated as *Who am I?* What is the true nature of individual being or existence? What does the self-designation of I or the *Self*, which is often referred to as the *I Am*, mean in terms of being? Who or what is this being called the *Self* or *I Am*?

The second mystery can succinctly be stated as *What is the nature of the world?* A closely related question is What is the nature of a person in the world? What is the nature of the body and mind of a person that lives a life in the world?

The third mystery can succinctly be stated as *What is the nature of life?* We don't just want to know what is the nature of living a physical embodied life in the world, but also what is the nature of a mental life consisting of thoughts, memories and other forms of mental imagination?

The reason modern physics and quantum theory have something to say about the first mystery is because everything that can be perceived in the world, which quantum theory refers to as an observation or measurement of the world, occurs in a subject-object relation. The subject, which is called I or the *Self*, is perceiving, observing or measuring some property of the object. The subject, which is the *perceiving I*, is observing some property of the observable object. In quantum theory, the *perceiving I* or subject is called the observer. Relativity theory also has something to say about the nature of the observer. In some sense, unifying quantum theory with relativity theory is the problem of making sense of the observer in both theories.

We'll have to come back to this problem a little later, but as a preview, relativity speaks about the observer observing or measuring the relativistic properties of its objects in an accelerated frame of reference, while quantum theory speaks about the observer observing or measuring the quantized properties of its objects as those properties arise from a quantum state of potentiality. The key point is that these observations always occur in the subject-object relation of perception.

Neither quantum theory nor relativity theory really have anything meaningful to say about the nature of the observer, only that the observer observes some observable property of its object in a subject-object relation. The most obvious interpretation of the observer is that the observer or *perceiving I* is the nature of perceiving consciousness, whatever that is. Perceiving consciousness is the perceiving subject or I that perceives the perceivable properties of its objects.

Quantum theory really has nothing to say about the nature of consciousness, so physicists mostly just ignore this question about the nature of the observer. Although physicists often claim that quantum theory is a description of an objective physical reality, this claim is patently false, since whatever property of physical reality is being measured or observed, that observation can only occur in a subject-object relation, and the subject is the observer. An objective physical reality cannot be defined independently of the subjective observations of an observer, since whatever property of physical reality that is being observed is always observed in a subject-object relation. Physical reality is just as much a subjective reality as it is an objective reality. The relation between the perceiving subject and its perceivable object is always perception.

Physicists want to obscure this issue by claiming that a quantum state of potentiality is an objective physical reality, but again, this is a false claim. A quantum state of potentiality by the very nature of its mathematical construction is a superposition or sum over observable states, and to actually observe some observable property of an object, this quantum state of potentiality must be reduced to a single observable state. In quantum theory, this is called the collapse of the wave-function. The observable states are always defined as eigenstates, which are solutions of some eigenvalue equation. The observable properties of the object are the eigenvalues, which in quantum theory are measurable quantities that take on discrete or quantized values. For example, the location of a point particle in space and time or the spin state of the particle are measurable quantities that take on quantized values. All possible measurable quantities of the particle arise as eigenvalue solutions of an eigenvalue equation, which is often referred to as the wave equation, and each solution defines an eigenstate, which is a measurable state of the particle. The most general wave-function is a sum or superposition over all possible eigenstate solutions. When some actual value of the particle is measured, this sum is reduced to a single eigenstate, and the measured value is the eigenvalue that corresponds to that eigenstate. That's what the collapse of the wave-function means. To measure a specific value of some property of an object, like the location of a point particle in space and time, the most general wave-function that corresponds to that object, which is constructed as a quantum state of potentiality by summing over all possible eigenstate solutions of the wave equation, has to be reduced to a specific eigenstate. The eigenstates are the measurable states. The eigenstate solutions for the wave equation, which give rise to the eigenvalues or quantized values that can be measured, typically require that some kind of periodic boundary condition is imposed on the wave-function. Periodic boundary conditions generate standing waves, which are the eigenstate solutions of the wave equation that give rise to quantized observable values. A measurement or observation always occurs in a subject-object relation, as the observer observes the observable value.

The claim that physicists often make that the quantum state is an objective physical reality is simply a false claim. The quantum state of potentiality only describes all possibilities about what can be observed in physical reality, not what is actually observed. What is actually observed requires a quantum state reduction or collapse of the wave-function, and that observation always occurs in a subject-object relation as an observer observes the observable value. There is no way to take the subjective observer out of observation. Whatever the observer observes is as much a subjective reality as it is an objective reality. By its very nature, the quantum state of potentiality is an unobserved state until it is observed, at which point it becomes reduced to an observed state of actuality. It simply makes no sense to speak of the quantum state as an objective physical reality. The quantum state is only a state of potentiality. It only describes what can possibly be observed, not what is actually observed.

The potentiality of the quantum state is always described in terms of probability. The quantum wave-function is a probability amplitude that expresses the quantum probability with which some quantized observable value can be measured. In ordinary quantum theory and quantum field theory, the wave-function describes the behavior of a point particle, like an electromagnetic field that describes the behavior of the quantum particle called a photon, and the quantum probability amplitude of the wave-function only describes the likelihood with which some observable property of the particle, like its location at a point in space and time or its spin state, can be measured. For electromagnetism, the electromagnetic field is the wave-function for the photon and Maxwell's field equations are the wave equations. Classical physics in the sense of Newtonian motion is recovered in the limit the wave-function becomes highly localized in the form of a wave-packet. However, there is a big caveat. The measurement of the quantized observable value of the particle requires that the quantum probability distribution is sampled in a random way. If bias arises in the way the quantum probability distribution is sampled, then all bets are off, and quantum physics loses its classical predictability.

Physicists argue about the Copenhagen interpretation of quantum theory versus the Many Worlds interpretation versus the Hidden Variable interpretation versus all other kinds of interpretations, but at the end of the day, the simple idea of a subjective observer observing the observable properties of objects in its own observable world in a subject-object relation of perception cuts through the nonsense of all possible interpretations. At the end of the day, there is only an observer, the subjective *perceiving I*, observing the observable properties of objects in its own observable world. To make sense of quantum theory in a way that is free of all measurement paradoxes of quantum theory, like the Schrodinger cat and Wigner friend paradoxes and the spooky-action-at-a-distance paradoxes of quantum entanglement, those observable objects must all appear within the observer's own observable world. The quantum state

must describe the observer's own observable world. It only makes sense to talk about the quantum state of a single observer's own observable world. Once we allow multiple observers to observe the same world, we inevitably run into all the measurement paradoxes of quantum theory. The only way these measurement paradoxes can be eliminated is if the quantum state of the world describes the observable world of a single observer. The hard thing to wrap your mind around is that everything you can perceive is just some observable property of some observable object that appears in your own observable world. Who are you? You are the subjective *perceiving I*.

This brings us to the second question about the nature of the world. Theoretical physics attempts to answer this question in terms of concepts like space and time and matter and energy. Relativity theory is the part of theoretical physics that attempts to describe the nature of the space-time geometry of the world. The most sophisticated description of the space-time geometry of the world is given in terms of Einstein's field equations for the space-time metric. The space-time metric is a field that gives a mathematical representation of how space-time geometry is measured. Just like in quantum theory, Einstein's field equations can be understood as a wave equation and the space-time metric can be understood as a wave-function.

Quantum field theory is the part of theoretical physics that attempts to describe the nature of matter and energy in the world. In any specific quantum field theory, there is always a wave equation, like Maxwell's equations for the electromagnetic field. The electromagnetic field is the wave-function that gives a mathematical representation for how electromagnetic phenomena are measured, just like the space-time metric gives a representation for how space-time geometry is measured. When the electromagnetic field is quantized, we speak of those measurements in terms of the quantized properties of a quantum particle called the photon. For example, we can measure the location of a photon in space and time in the sense of the space-time coordinates of a point particle, or we can measure the spin state of the photon, which is referred to as a polarization state in the sense of polarized light. In the sense of quantum theory, the wave equation has eigenstate solutions that specify the measurable states of the particle, and the most general wave-function is a sum over all possible eigenstate solutions. When we actually measure some specific state of the particle, we have to reduce the wave-function to a specific measurable state, which is called the collapse of the wave-function.

At first glance, there is really no good reason why we shouldn't treat Einstein's field equations for the space-time metric the same way we treat Maxwell's equations for the electromagnetic field when we quantize the photon field. Since Einstein's field equations give a representation for gravity, if we did that, we would quantize the gravitational field in terms of a quantum particle called the graviton. Just as the quantized electromagnetic field gives a representation for the quantum point particle called the photon, a quantized

gravitational field should give a representation for the quantum point particle called the graviton.

Actually, there is a good reason why we shouldn't do this. When we quantize the electromagnetic field, we have to assume that the photon propagates through some fixed background space-time geometry, which is usually taken to be flat Minkowski space. The problem is, gravity is understood as the dynamical curvature of space-time geometry. The only way we can understand the quantization of the gravitational field along the lines of quantum field theory is if the graviton as a point particle propagates through some fixed background space-time geometry, like flat Minkowski space, but that would be a logical contradiction, since by its very nature a theory of gravity must give a representation of the dynamical curvature of space-time geometry.

The problem isn't quantizing gravity. The problem is with quantum field theory. There is no way to understand gravity as a quantum field theory, since we'd then have to assume that the graviton propagates through a fixed background space-time geometry, like flat Minkowski space, which contradicts the very idea of gravity as the dynamical curvature of space-time geometry.

The problem with theoretical physics is with quantum field theory as a representation of the nature of matter and energy in some space-time geometry. Quantum fields represent matter and energy in terms of point particles. Those point particles have to propagate through some fixed background space-time geometry. There is no way to represent gravity in this way because a theory of gravity must give a representation of the dynamical curvature of space-time geometry.

Another problem arises when we try to understand gravity in the same way that we understand electromagnetism. Einstein's field equations for the space-time metric are the analogue for gravity of Maxwell's equations for the electromagnetic field, and a graviton is the analogue of a photon. The problem is that if we try to design an experimental apparatus that measures the graviton as a point particle at a point in space and time, we run into a big problem. To measure the graviton as a point particle, we have to concentrate so much energy into such a small region of space that we create a Planck-size black hole in that region of space, and nothing is observable beyond the limits of the event horizon of the black hole. It seems that relativity theory forbids the measurement of the graviton as a point particle. All attempts to do so only create black holes, and then we measure nothing. This is the basic reason why Einstein's field equations for the space-time metric cannot be understood as a quantum field theory in the same way that electromagnetism is understood. Quantum field theory is inherently a point particle description, but it appears that there is no such thing as a graviton description of gravity.

This is the reason we have to throw out the idea of quantum field theory as a representation of point particles propagating through some space-time geometry. This is not a fundamental idea. A quantum field may still have value in an approximate sense as an effective field theory, but not as a fundamental idea. It's still ok to think of the world as having a space-time geometry, but point particles propagating through that space-time geometry are not fundamental things. Even the idea of the space-time geometry of the world is not a fundamental idea because the world is not a fundamental thing. The idea of quantum field theory as giving a representation of matter and energy in terms of point particles existing inside and propagating through the space-time geometry of the world is not a fundamental idea. Neither the idea of the world, nor the idea of the space-time geometry of the world, nor the idea of point particles existing inside and propagating through the space-time geometry of the world are fundamental. None of these ideas are fundamental. We have to ask: What is the fundamental idea?

What is the solution for the quantization of gravity if we throw out the idea of point particles existing in and propagating through a space-time geometry? The answer is weird, but it seems to be the only possible answer. The answer is called the holographic principle of quantum gravity.

What is the fundamental idea? The idea of energy is still a good fundamental idea, but we have to throw out the idea of matter as being fundamental. Actually, modern theoretical physics has pretty much moved beyond the idea of matter as being fundamental in the sense of mass. Modern physics assumes that all point particles are fundamentally massless, like the photon, and that all mass arises through a mechanism called spontaneous symmetry breaking. The Higgs mechanism gives mass to the massless particles through a process of spontaneous symmetry breaking, which is like a phase transition that occurs as the temperature of the universe is lowered below some critical value. The mass of all particles spontaneously emerges as a thermodynamic property of particles when the temperature of the universe is low enough. The problem is, although the idea of energy is still fundamental, the idea of point particles is not. What about space and time? Are the ideas of space and time fundamental? This is where things get a bit tricky.

In all modern theories of quantum gravity, energy is still fundamental, but the only other fundamental thing is information. The idea of space and time, like the idea of point particles, can always be reduced to energy and information. The tricky part of quantizing gravity is only in terms of understanding how that energy arises and how the information is encoded.

Actually, there is one more thing in addition to energy and information that needs to be included to understand this explanation, but paradoxically, that extra thing is not really a thing. That extra thing is called the void, which physicists call the vacuum state. The

vacuum state is the ground state of existence in which nothing is perceived. It is a state of zero energy and no information, and yet in some mysterious way it is the source of all energy and information. It is the source of everything that can be perceived. In a weird way, the void is also the source of consciousness that perceives all the perceivable things. It is the source of the *perceiving I*. In absolute terms, the vacuum state can only be described as a void of absolute nothingness.

Physicists often make the claim that the vacuum state can be understood in terms of quantum field theory as a boiling cauldron of virtual particles, but again, this is a false claim based on the idea that quantum field theory is fundamental, which it is not. It's not even possible to understand the vacuum state in terms of space-time geometry. Neither the idea of point particles nor the idea of space-time geometry is fundamental. To try to characterize the vacuum state in terms of either virtual particles or some kind of space-time geometry that virtual particles can propagate through is a mistaken assumption. The reason this is a false assumption is because both the concept of point particles in quantum field theory and the concept of space-time geometry in relativity theory can be reduced to the more fundamental concepts of energy and information.

To fully appreciate the mystery of the vacuum state, you need look no further than the idea that everything perceivable arises from the vacuum state as some kind of excitation of energy and information. The problem that physicists seem to be unwilling to face is that everything perceivable also arises in a subject-object relation as the perceiving subject perceives some observable property of its perceivable object. The only logical conclusion that can be drawn is that not only does the perceivable object arise from the vacuum state as an excitation of energy and information, but the perceiving subject also arises from the vacuum state. If we understand the perceiving subject or observer as perceiving consciousness, the only conclusion we can draw is that the perceiving consciousness of the subject arises from the vacuum state simultaneously as its perceivable object also arises from the vacuum state. The subject and its object must arise together in the relationship we call perception. Both subject and object arise together from the vacuum state in a relationship of perception.

This fundamentally tells us that the vacuum state is not only the source of all energy and information inherent in objects, but also the source of the perceiving consciousness that perceives the perceivable properties of all objects. The subject-object relation of perception is the result of both energy and information arising from the vacuum state, which gives the perceivable objects their perceivable properties, and the perceiving consciousness of the subject arising simultaneously from the vacuum state, which perceives those perceivable properties. The triad of energy, information and perceiving consciousness all have to arise together in a subject-object relation of perception, and they all arise simultaneously from the vacuum state. In other words, the vacuum state is not only the source of the perceivable objects, but also the source of the perceiving

subject. The difficult part of understanding how this triad of energy, information and perceiving consciousness arises from the vacuum state is the mystery of understanding the vacuum state in absolute terms as a void of absolute nothingness.

The mystery of how the *perceiving I*, subject or observer arises from the vacuum state will be discussed later on. Let's just assume that the observer arises from the vacuum state in some mysterious way, and focus our attention on how energy and information simultaneously arise from the vacuum state in the subject-object relation of perception. This is where the holographic principle of quantum gravity has pretty much solved the mystery.

The mystery of the physical world is how energy and information create the world. Again, the creation of the world can only be understood in the sense of a subject-object relation, as the perceiving subject perceives some perceivable properties of the objects that appear in that world. The holographic principle is telling us that all of these perceivable properties of the world, which not only include the perceivable properties of all the point particles in that world that are given a representation by quantum field theory, but also all the perceivable properties of the space-time geometry of that world that is given a representation by relativity theory, can fundamentally be reduced to pure energy and information. The concepts of energy and information are more fundamental than either the concepts of point particles or space-time geometry.

What's Wrong with Physics

Conventional physics has the whole thing ass-backwards. The number one mistake that conventional physics makes is to falsely assume that there is an objective physical reality of the world out there that we can perceive. This idea contradicts the very notion of quantum theory, which is the foundation for all of modern theoretical physics. In quantum theory, the quantum state is not an observable state. The quantum state is a state of potentiality that expresses the possibility of observation. The quantum state is formulated as a superposition or a sum over all possible observable states. An observation only occurs when a choice is made and one of these possible observable states is actually observed. The other way the quantum state can be formulated is as a sum over all possible paths. Again, a choice must be made wherever a path is actually followed. In quantum theory, this choice goes by various names, such as a quantum state reduction or the collapse of the wave function. The nature of this choice about what we can observe in the world or which path we can follow through the world is at the heart of what's called the measurement problem of quantum theory.

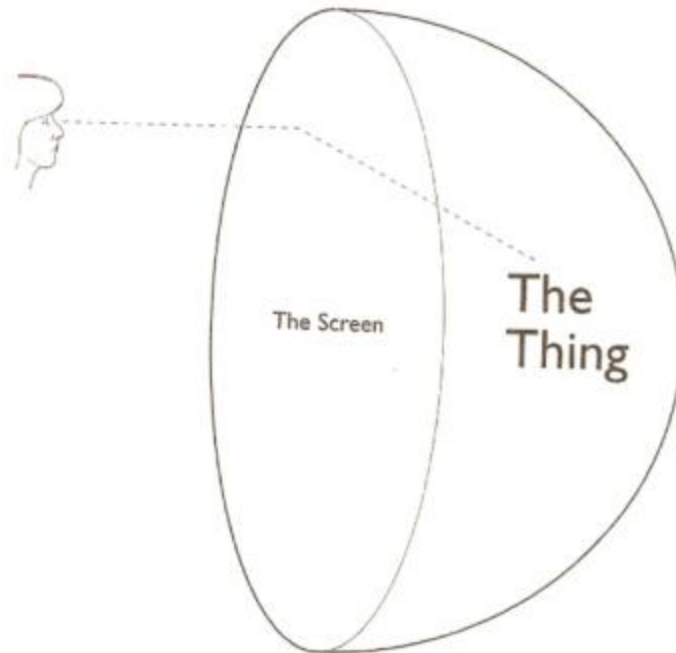
The bottom line is that there is no objective physical reality of the world out there that we can perceive. With every observation of the world, we have to make a choice about what we'll observe in the world or which path we'll follow through the world. The

quantum state of the world only expresses all possibilities about what we can observe in the world, which is always formulated as a superposition of all possible observable states. That's what makes the quantum state a state of potentiality.

In the language of quantum theory, the quantum state is inherently entangled due to this superposition of all possible observable states. Quantum entanglement expresses this potentiality of observation. Quantum entanglement tells us that there is no such thing as local realism. This is not just a theoretical idea, but has been confirmed by direct observation of the world, and for which the Nobel prize was recently awarded. When the quantum state of two distinct things that can be observed in the world becomes quantum entangled, observation of the first thing determines the nature with which the second thing can be observed, even if those two things appear to have become separated by a large distance. This is simply a consequence of observation reducing the entangled quantum state, which is a superposition of all possible observable states, to an actual observable state. Reduce the quantum state of one thing and you also reduce the quantum state of the other thing. Quantum entanglement tells us that there is no objective physical reality of the world out there that we can perceive in the sense of local realism. Things do not actually exist out there with their own local properties. Quantum entanglement tells us that the observation of anything is inherently connected to the observation of everything else that we can perceive in the world.

Conventional physics with its mistaken idea that there is an objective physical reality of the world out there that we can perceive also mistakenly assumes that a world of matter, energy, space and time exists. Conventional physics, like all other branches of science, mistakenly assumes that in that perceivable world the emotionally animated form of a person comes into existence and that within that personal form personal consciousness emerges. This idea is just flat-out wrong. It is logically impossible that the consciousness that perceives the world can arise within the world that it perceives. The source of perceiving consciousness cannot be an object of perception that appears within the field of view of the observer's perceiving consciousness. Simply put, the source of consciousness cannot be an object that appears within consciousness.

In some sense, the consciousness of the observer must be outside the world that it perceives, just like the consciousness of an observer that watches a movie that is being displayed on a computer screen is outside the computer screen. Everything that the observer can perceive in the movie is a form of information that can be reduced to bits of information encoded on the computer screen. Those forms are projected like images from the computer screen to the observer's point of view outside the screen and are animated in the flow of energy that flows through the computer. Everything the observer can perceive is an object of perception that is being displayed on the computer screen. John Wheeler called this idea about the nature of perception "*It from bit*".



The Observer, its Holographic Screen, and its Object of Perception

How does the holographic principle solve the mystery of the creation of the world? The answer is that creation always has to begin with an observer in an accelerated frame of reference. Putting aside the mystery of the observer for the moment, what exactly is an accelerated frame of reference? Relativity theory answers this question in terms of an observer at the origin or central point of view of its own coordinate system. The basic idea of relativity theory is called the principle of equivalence. Every coordinate system is equivalent to every other coordinate system. In effect, what this means is that the observer has no individual properties other than the location of its point of view at the center of its own coordinate system and how that coordinate system moves relative to other coordinate systems. There is an equivalence of all observers, which basically means that observers only observe different things because they're located at the central point of view of different coordinate systems that move relative to each other. In the sense that the observer is the perceiving subject in the subject-object relation of perception, all the observers are the same perceiving consciousness, just located at different points of view. The only reason different observers observe different things is because each observer is located at its own point of view in its own coordinate system that moves relative to other coordinate systems. The perceiving consciousness located at each point of view is the same perceiving consciousness, just located at a different point of view relative to other points of view and moving relative to other points of view. That's what the principle of equivalence means.

Relativity theory with its principle of equivalence is telling us that in some sense the force of gravity, like all other forces, is an illusion that results from the accelerated motion of the observer. The force of gravity, like all other forces, is equivalent to an acceleration, and it is the central point of view of the observer that is moving with accelerated motion relative to the motion of other observers. That's why they observe different things. The accelerated motion of the point of view of the observer relative to the motion of all other observers defines the observer's accelerated frame of reference. For example, an observer that accelerates forward inside a rocket-ship that accelerates through empty space observes a downward force that acts on objects in the space-ship that is equivalent to the force of gravity an observer observes on the surface of the earth. There is no way to distinguish between the force of gravity that is observed to act on objects on the surface of the earth and the downward force observed to act on objects in the space-ship that accelerates forward due to the thrusters of the rocket-ship that propel it forward. An accelerating observer, like an observer in a rocket-ship that accelerates forward through empty space, observes the same effects of gravity as observed by an observer that stands on the surface of the earth. In other words, the observed force of gravity is equivalent to an observer's acceleration. That's what the principle of equivalence means.

Neither theoretical physics nor neuroscience nor any other branch of science can explain the nature of the observer's perceiving consciousness. In relativity theory, the observer is simply understood to be a point of view that defines its own frame of reference. That point of view can be understood as the origin of a coordinate system. When the observer's coordinate system moves with accelerated motion relative to the coordinate systems of other observers, the accelerating observer is understood to be in an accelerated frame of reference. The importance of an accelerated frame of reference has to do with the nature of gravity. In relativity theory, the principle of equivalence tells us that the observer's perception of the effects of gravity are equivalent to the observer's own accelerated motion. An accelerating observer, like an observer that accelerates through empty space in an accelerating rocket ship, observes the same effects of gravity as observed by an observer that stands on the surface of the earth.

In relativity theory, the effects of gravity are understood to arise from the dynamical curvature of the observer's own space-time geometry. The only reason the observer's space-time geometry is curved is due to the observer's own accelerated motion in its accelerated frame of reference. Every accelerating observer observes the effects of gravity in its own accelerated frame of reference due to the dynamical curvature of its own space-time geometry that only occurs due to its own accelerated motion.

The reason the observer's accelerated motion is so important is because it explains the nature of the holographic principle. The holographic principle is the most fundamental scientific concept known to man, as it not only explains the nature of all the elementary

particles that appear to exist in the world in the sense of quantum theory, atomic theory, and the fundamental electromagnetic and nuclear forces, but it also explains the nature of the dynamical curvature of the space-time geometry of the world in the sense of relativity theory and the gravitational force.

The thing to be clear about with the holographic principle is that we have to begin with the assumption that an observer exists. The holographic principle cannot explain the nature of the observer or its perceiving consciousness, only that the observer exists at a point of view. This is the number one assumption of the holographic principle. We have to assume that an observer exists at a point of view, which can be understood as the central point of view or origin of its own space-time geometry. The second thing we have to assume is that the observer undergoes some kind of accelerated motion in its accelerated frame of reference, which gives rise to the dynamical curvature of its space-time geometry and explains the perceived effects of gravity.

Again, to be clear about things, we're not explaining the nature of the observer except as the perceiving consciousness that exists at a point of view at the center of its own space-time geometry. We're not explaining where the observer or its consciousness comes from. We're also not explaining where the energy of the observer's own accelerated motion comes from. We have to begin with the assumption that an observer exists at a point of view at the center of its own coordinate system, which defines its own space-time geometry, and the assumption that the observer undergoes some kind of accelerated motion that gives rise to the dynamical curvature of its own space-time geometry, which explains the perceived effects of gravity. We are not explaining where the perceiving consciousness of the observer comes from or where the energy of the observer's own accelerated motion in its accelerated frame of reference comes from.

It seems as though the number one assumption we have to make to explain the nature of the observable world is the assumption that the perceiving consciousness of an observer must exist before that world can be observed. Once we make this assumption, then there is a clear path that allows us to understand how the observer's own observable holographic world appears to come into existence in terms of the observer's own accelerated motion. The absolute irony of this approach is that we really do not have to make an assumption that the observer exists. Everyone knows in their heart of hearts that they exist. You know with absolute certainty that you exist. The only question is: What exactly is the nature of your existence as you perceive the world?

You know with absolute certainty that you exist because you know that you are. The only true thing you can ever know about yourself is your own sense of beingness, which is your own sense of I-Am-ness. You know that you are. You know that you exist as the perceiver of your own world as you perceive that world. You are aware of your own sense of being present as you perceive your own perceivable world. Your sense of

being present as you perceive your own perceivable world is your sense of being present as the perceiver of your own world, which is your own sense of I-Am-ness or beingness. You are always present as a pure presence of perceiving consciousness at the central point of view of your own perceivable world. That presence of perceiving consciousness at the central point of view of its own perceivable world is the nature of the observer. For this argument to go forward, we really do not have to assume that an observer exists. You know with absolute certainty that you exist as the observer of your own observable world. That is the only true thing you can ever know about yourself.

The next step in terms of understanding the holographic principle is the idea that the observer's own accelerated motion gives rise to its own event horizon. The reason the observer's event horizon is so important is because its event horizon becomes its holographic screen, which defines its own holographic world. The observer is the perceiving consciousness that exists at the central point of view of its own holographic world. The observer's holographic world is always constructed on a holographic screen that surrounds the observer's central point of view and displays all the images of its own holographic world, just like a computer screen displays all the animated images of a virtual reality movie that are projected to the point of view of an observer. The observer's holographic screen arises as its event horizon due to its own accelerated motion.

Once we put the observer in an accelerated frame of reference, something else weird appears to happen. The other pillar of relativity theory in addition to the principle of equivalence is the constancy of the speed of light for all observers, no matter how they move relative to each other. The speed of light really has nothing to do with light per se, but rather is like the maximal rate of information transfer in three dimensional space. Information can only be transferred from one point in three dimensional space to another point in three dimensional space at the maximal rate of the speed of light. This is the maximal velocity with which information can be transferred from one point to another point in three dimensional space. We can think of the speed of light as the maximal rate of information transfer in a computer or in a network of computers.

Once we have a maximal rate of information transfer in space, something else weird appears to happen when the observer is in an accelerated frame of reference. The observer's observation of things in space becomes limited by a bounding surface of space called an event horizon. The observer's event horizon is a two dimensional bounding surface of space that bounds some three dimensional region of space and limits the observer's observation of things within that region of three dimensional space. The observer's event horizon is as far out in three dimensional space as the observer can see things in space. The observer cannot observe anything beyond its event horizon because a light ray that originates beyond the event horizon can never reach the observer's point of view on the other side of the event horizon as long as the observer continues to undergo accelerated motion. This limitation of the observer's

observations is a direct result of the constancy of the speed of light for all observers, no matter how they move relative to each other. The observations of an accelerating observer are always limited by the observer's own event horizon that arises due to its accelerated motion.

The observer's event horizon is a two dimensional bounding surface of space that limits its observations of things in three dimensional space due to the limitation of the speed of light as the maximal rate with which information can be transmitted in three dimensional space. Nothing is observable to the accelerating observer beyond the limits of its own event horizon. As long as the observer continues its accelerated motion, no light signal that originates from the other side of its event horizon can ever reach the observer due to the limitation of the speed of light. The observer can only be understood as the perceiving consciousness that is present at a point of view that follows an accelerating worldline through its own space-time geometry.

To be clear about things, the observer only appears to be in a state of accelerated motion relative to the frames of reference of other observers. There is no such thing as an absolute frame of reference, at least not at the level of the observation of things. From the point of view of any particular observer, the observer is simply at the central point of view of its own coordinate system. The concept of an accelerating observer is only valid in the sense of the relative motion of different observers when different frames of reference accelerate relative to each other.

Relativity theory is telling us the observer is a point of perceiving consciousness at the central point of view of its own coordinate system that defines its own world, and the accelerated motion of the observer arises in an accelerated frame of reference. Relativity theory tells us that accelerated motion always gives rise to an event horizon that surrounds the observer's central point of view and limits the observer's observations of things in space. The accelerating observer's event horizon is a two dimensional bounding surface of space that surrounds the observer's central point of view and limits the observer's observations of things in space.

Different observers only observe different things because they're in different frames of reference that accelerate relative to each other. That's the essence of the principle of equivalence. The big question is how or why do the observers observe different things? The secret of the answer has to do with how each observer's observations become limited by its own event horizon that arises when the observer enters into an accelerated frame of reference. The holographic principle tells us that the observer's event horizon acts as a holographic screen that encodes bits of information for everything the observer can observe in its own holographic world.

There's no easy way to say this, so it's best to just say it and then discuss what it all means. The observer's event horizon acts as a holographic screen that encodes bits of information, just like a computer screen. The observer's screen encodes information for everything the observer can observe in its own holographic world. That observable world is like the projected and animated images of a computer-generated virtual reality. The images are forms of information projected from the screen to the observer's central point of view and animated in the flow of energy that energizes the computer. In effect, the observer as it observes its own holographic world is only observing the images of a computer-generated virtual reality projected from its own screen to its central point of view, just like an observer that plays a computer-generated virtual reality game.

The world is a virtual reality, just like depicted in the movie the Matrix. In reality, all you're really doing is playing a virtual reality game. This is a computer-generated virtual reality game. The images of the game are projected from a computer screen to your central point of view. In the language of modern theoretical physics, the images are forms of information, and all the bits of information that characterize the images are encoded on the computer screen. The images only appear to be three dimensional because the images are holographic in nature. The world you perceive is a holographic world, and everything you can perceive is no more real than a holographic image. All the bits of information are encoded on the screen, which is a two dimensional surface. In the language of theoretical physics, these bits of information are called qubits, which is short for quantized bits of information. We really do live in the Matrix. All the qubits of information that characterize the three dimensional world we perceive are encoded on a two dimensional screen and the encoding of that information on the screen is specified in terms of mathematical structures called matrices, just like depicted in the Matrix. A matrix is a two dimensional array of numbers. This two dimensional array of numbers is encoded on the screen. Each pixel on the screen encodes a single bit of information in a binary code of 1's and 0's. The world we perceive only appears to be three dimensional because it's holographic.

The key thing that the holographic principle tells us is that the accelerating observer's event horizon acts as a holographic screen that encodes all the bits of information for everything the observer can observe in its own holographic world, and the screen projects all the images of the observer's holographic world, which are projected forms of information, to its central point of view. This is just like the projection of the images of a computer-generated virtual reality game from a computer screen to the point of view of the observer that plays the game. Everything perceived in the game is a projected image. Those projected images in turn are animated by the energy that energizes the computer.

When the accelerating observer's event horizon encodes qubits of information, the horizon turns into a holographic screen, and everything the observer can observe in its

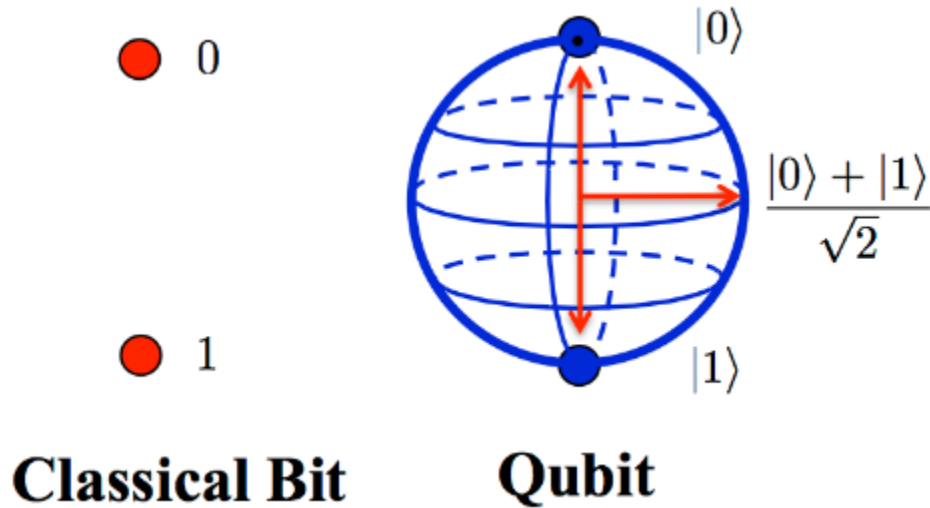
own holographic world is like an image projected from the screen to the observer's central point of view. The image is a form of information that can always be reduced to qubits of information encoded on the screen. The screen encodes qubits of information in terms of matrices, which are two dimensional arrays of numbers. Each pixel on the screen encodes a bit of information in a binary code of 1's and 0's.

The big question is how is information encoded on the observer's event horizon? The answer is that information is encoded in terms of quantized bits of information called qubits. A qubit is understood to be mathematically represented in terms of a matrix, like a Pauli spin matrix that represents a spin variable that can only be observed in either a spin up or spin down state. The spin variable encodes measurable information in a binary code of 1's and 0's like a computer switch that is either on or off. This measurable information arises from the eigenvalues of the matrix. In quantum theory, the Pauli spin matrix is formulated in terms of an $SU(2)$ matrix, which also gives a mathematical representation of rotational symmetry of the surface of a sphere. The eigenvalues of the matrix, which are the nature of the measurable information encoded by the matrix, are entangled due to quantum entanglement, which is a mathematical reflection of this rotational invariance. At the level of qubits, quantum entanglement is only reflecting that information is being encoded on the surface of a sphere in a rotationally invariant way.

A spin $\frac{1}{2}$ matrix, S , which is a 2×2 array of numbers, allows for an eigenvalue equation of the form $S|s\rangle = s|s\rangle$. The measurable spin states are called eigenvectors, which are 1×2 arrays of numbers and are denoted as $|1\rangle$ and $|0\rangle$. The measurable values of spin are the eigenvalues of the matrix, which are $s = \pm \frac{1}{2}$. An entangled spin state $|s\rangle = a|1\rangle + b|0\rangle$ is a superposition of the eigenstates, where $a^2 + b^2 = 1$. In terms of the surface of a sphere, $|s\rangle$ can be understood as pointing in some direction between up and down. Although this formalism can describe a spin $\frac{1}{2}$ particle, a generic spin $\frac{1}{2}$ variable specifies information encoded in a binary code of 1's and 0's.

In quantum theory, this encoding of quantized bits of information, called qubits, is understood to arise in terms of matrices, just like a spin $\frac{1}{2}$ variable that can only be observed to point up or down like a computer switch that is either on or off. In quantum theory, a spin $\frac{1}{2}$ variable is mathematically represented by a 2×2 $SU(2)$ matrix. An $SU(2)$ matrix gives a mathematical representation of rotational symmetry on the surface of a sphere, but its eigenvalues also encode information in a binary code. An $n \times n$ $SU(2)$ matrix encodes n quantized bits of information. This encoding of information naturally occurs on a two dimensional surface in a rotationally invariant way, as though each pixel on the screen encodes a bit of information. In mathematical terms, this encoding of information on a surface is understood to arise in terms of the eigenvalues of a matrix. In quantum theory, qubits of information are understood to be entangled because they arise as the eigenvalues of a matrix. Quantum entanglement is a natural property of the

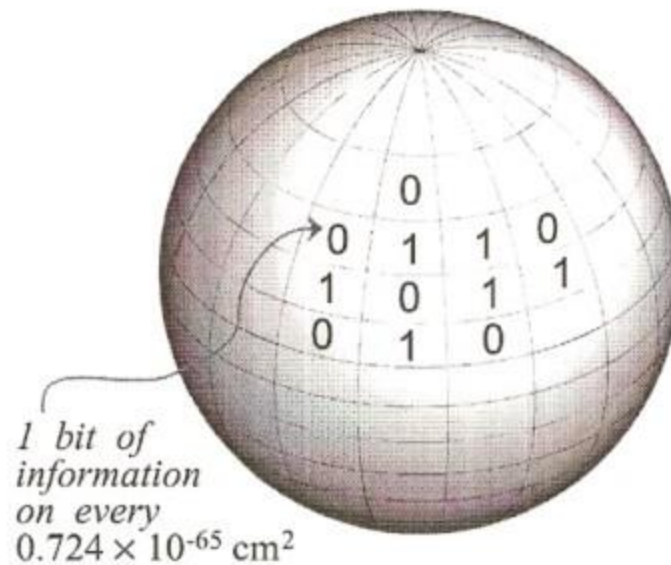
eigenvalues of an $SU(2)$ matrix, which represents rotational symmetry on the surface of a sphere.



Qubit as the Quantized Information Encoded on a Planck Size Event Horizon

This way of encoding quantized bits of information on the surface of a sphere is called a matrix model. The next big question is where does the surface of the sphere come from? The answer the holographic principle gives is that the surface of the sphere arises as an observer's event horizon due to the observer's own accelerated motion.

The accelerating observer's event horizon becomes its holographic screen when it encodes qubits of information. A qubit is a quantized bit of information mathematically represented by a matrix. A matrix is a two dimensional array of numbers that must be encoded on a two dimensional surface of space, which always arises as the observer's event horizon. A qubit is like a spin variable defined in quantum theory that can only be observed to point up or down. Unlike a classical bit of information that can only take on the values of 1 or 0, a qubit has the property of quantum entanglement that represents rotational symmetry on the surface of a sphere. In quantum gravity, the smallest possible event horizon is a Planck-size event horizon that encodes a single qubit of information. Larger event horizons encode more information, but always in terms of an integral number of qubits, which is how information is quantized in quantum gravity.



Holographic Principle

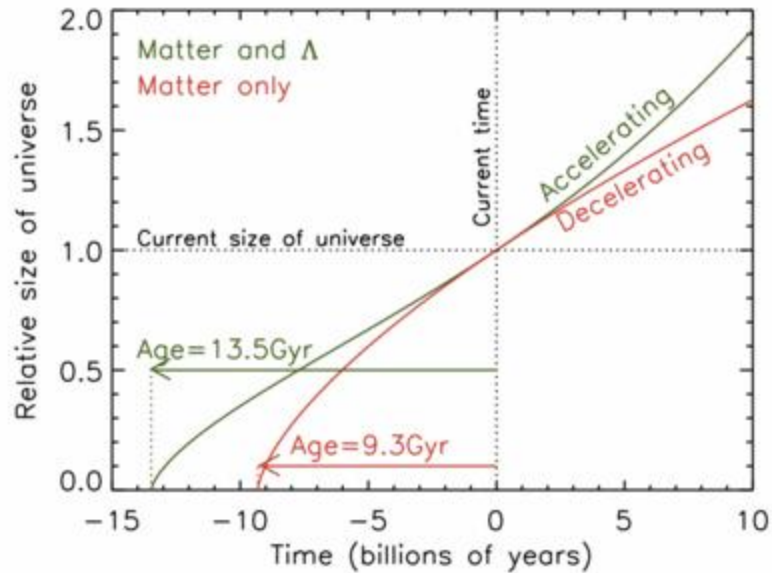
The size of a pixel that encodes a single qubit of information on the surface of the event horizon is called the Planck area. A Planck size event horizon is the smallest possible event horizon because it encodes a single qubit of information. A larger event horizon encodes more qubits of information, but always in an integral number of Planck areas. This is how space-time geometry is understood to become quantized in quantum gravity. This quantization of space-time geometry in terms of qubits of information encoded on an event horizon is called the holographic principle of quantum gravity. Quantization of space-time geometry occurs because an event horizon must consist of an integral number of Planck areas, each of which acts like a pixel on the surface of an observer's event horizon and encodes a qubit of information. The Planck area is the fundamental quantum of space-time geometry, and a qubit is the fundamental quantum of information.

In quantum gravity, the Planck area is specified in terms of the gravitational constant, the speed of light and Planck's constant as $\ell^2 = \hbar G / c^3$, and the number of qubits of information encoded on an event horizon of surface area A is given as $n = A / 4\ell^2$. These n qubits of information are encoded in a binary code by an $n \times n$ matrix, which is an $n \times n$ array of numbers. It turns out that what we call the laws of physics, like the law of gravity, are simply the result of how qubits of information are encoded on a holographic screen and the energy inherent in the observer's accelerated frame of reference that gives rise to the observer's event horizon that acts as a holographic screen when that surface encodes qubits of information. The laws of physics are like the operating system or computation rules that govern the operation of the computer-generated virtual reality game. The laws of physics are not really anything fundamental, but rather only a result

of creating a quantum computer that allows for the creation of the computer-generated virtual reality game. That quantum computer is created when the observer enters into an accelerated frame of reference that gives rise to an event horizon that acts as the observer's holographic screen when that bounding surface of space encodes qubits of information.

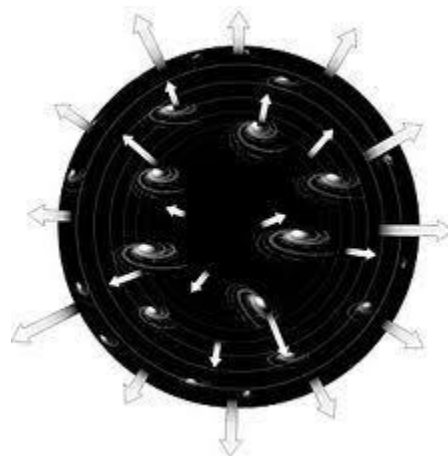
The AdS/CFT correspondence is an explicit example of the holographic principle and how a holographic world is created in anti-de Sitter space with a negative cosmological constant, which gives rise to the accelerated contraction of space. Anti-de Sitter space has a conformal boundary, and information can be encoded on that boundary in terms of an $SU(N)$ conformal field theory. In the large N limit, the information encoded on the conformal boundary of anti-de Sitter space is equivalent to gravity in anti-de Sitter space. The way this works is that the information encoded on the 10-dimensional conformal boundary of anti-de Sitter space by a supersymmetric $SU(N)$ conformal field theory in the large N limit is equivalent to 11-dimensional supergravity in anti-de Sitter space. When we understand the extra dimensions are being compactified, 11-dimensional supergravity explains all the laws of physics in terms of Einstein's field equations for the space-time metric, which is the nature of the gravitational field, along with Maxwell's equations for the electromagnetic field and the Yang-Mills equations for the nuclear fields. The matter fields, as described by Dirac's equation for the electron and quark fields, naturally arise from supersymmetry. In other words, the laws of physics in 11-dimensional anti-de Sitter space are equivalent to the information encoded by a supersymmetric $SU(N)$ conformal field theory defined on the 10-dimensional conformal boundary of anti-de Sitter space. The AdS/CFT correspondence is an explicit example of how to construct a holographic world.

The problem with the AdS/CFT correspondence is that we do not live in anti-de Sitter space. We live in an exponentially expanding universe as characterized by de Sitter space and the accelerated expansion of space. This is confirmed by direct observation. When we look out at distant galaxies, the farther away the galaxy, the faster the galaxy appears to accelerate away from us. The limits of our observations are defined by a cosmic horizon at which point galaxies appear to move away from us at the speed of light. The Nobel prize was awarded for this discovery of observational cosmology.



Accelerating Universe

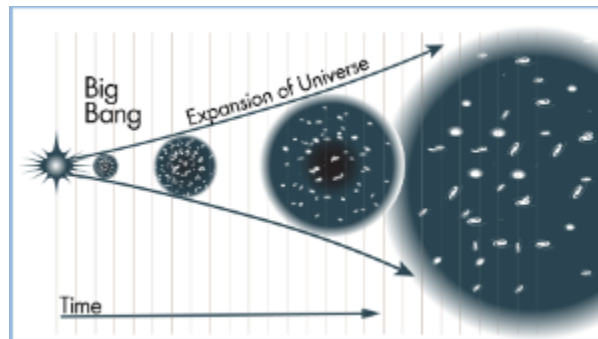
Every accelerating observer observes events in its own holographic world in terms of the qubits of information encoded on its holographic screen that arises as its event horizon due to its own accelerated motion. The ultimate size of the event horizon that defines the observer's holographic world is called a cosmic horizon. The idea of a cosmic horizon is related to the idea of dark energy and the accelerated expansion of space. In relativity theory, dark energy is called a cosmological constant that gives rise to the accelerated expansion of space that always expands relative to an observer's central point of view, and its cosmic horizon is called a de Sitter horizon.



Accelerated Expansion of Space

An observer in de Sitter space observes its own holographic world due to qubits of information encoded on its own de Sitter cosmic horizon that arises from dark energy

and the accelerated expansion of space, which in relativity theory is understood as a positive cosmological constant. In relativity theory, the accelerated expansion of space always expands relative to the central point of view of an observer. At the observer's cosmic horizon, space appears to expand away from the observer at the speed of light, and so nothing is observable to the observer beyond the limits of its cosmic horizon.



Accelerated Expansion of the Universe

When the observer's cosmic horizon encodes information for its own holographic world, its horizon becomes its holographic screen. Everything observable to the observer in its own holographic world is reducible to information encoded on its holographic screen. Everything observable in the observer's holographic world is like a holographic image projected from its screen to its point of view at the center of its own holographic world.

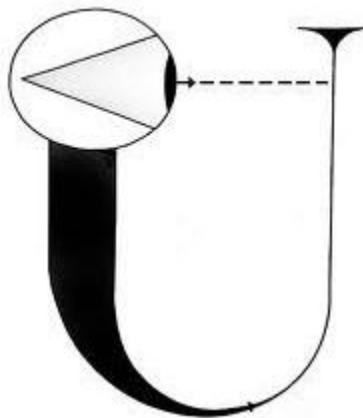
The idea of qubits of information being the fundamental underlying basis for quantum theory has recently received a great deal of attention, including the award of a Nobel prize for experiments in quantum entanglement. The big question these experiments have not answered is exactly where is this information encoded? The holographic principle answers this question in terms of the surface of an event horizon that arises due to an observer's own accelerated motion. In terms of an observer's cosmic horizon that arises due to the expression of dark energy, that accelerated motion is understood in terms of the accelerated expansion of space. Even without the expression of dark energy, any accelerating observer will have its observations of events in space limited by an event horizon. In the generic case, this event horizon is called a Rindler horizon.

Physicists like Leonard Susskind accept that the de Sitter cosmic horizon is the nature of the observer's holographic screen that defines its holographic world when qubits of information are encoded on its horizon. The stumbling block in terms of formulating this idea in theoretical physics is that there is no analogue of the AdS/CFT correspondence that generalizes to de Sitter space. The basic problem comes down to the nature of the observer. In de Sitter space, the observer is always at the central point of view of its own de Sitter cosmic horizon. The observer's holographic world is only constructed

when its cosmic horizon becomes its holographic screen and encodes qubits of information for everything it can observe in its own holographic world.

An accelerating observer always observes events in its own space-time geometry in terms of the curvature of that space-time geometry. The curvature of that space-time geometry is the nature of the gravitational field as formulated by Einstein's field equations for the space-time metric. The situation in de Sitter space is very similar, except the curvature of that space-time geometry is being generated by the accelerated expansion of space. The expression of dark energy in terms of the accelerated expansion of space, like any other expression of mass or energy, is a generator of gravity in terms of the curvature of that space-time geometry. Dark energy generates gravity. The odd thing about this process is that the expression of dark energy is always counterbalanced by the expression of gravity. The negative potential energy of gravity always exactly cancels out the positive dark energy. The negative potential energy of gravitational attraction exactly cancels out the repulsive effect of positive dark energy, and so the total energy of this process exactly adds up to zero. This is actually confirmed by observations of the universe. A universe with a total energy of zero is asymptotically flat, which is confirmed by direct observations of the universe.

The big puzzle we have to confront is about the nature of the observer. The observer is best understood as arising at the central point of view of its own holographic world that is defined in terms of information encoded on its own cosmic horizon that arises due to dark energy and the accelerated expansion of space. The big question is: Where does the observer come from? The answer John Wheeler proposed is that the observer and its holographic world are a self-excited circuit. John Wheeler proposed this idea of the observer and its world as a self-excited circuit when he tried to scientifically understand the nature of an observer and the world that it perceives in terms of information.



Universal Observer as a Self-Excited Circuit

There is actually a great deal of merit in this idea of the observer and the world that it perceives as a self-excited circuit since perception always occurs in a subject-object relation. The observer is the subject and whatever it perceives in its world is an object of perception. In terms of the holographic principle, the observer always arises at the central point of view of its own holographic world, and whatever it perceives in that world is a form of information that can be reduced to qubits of information encoded on its own holographic screen. The observer's holographic screen is an event horizon that arises due to the observer's own accelerated motion, which in the case of the expression of dark energy is the accelerated expansion of space. The observer's event horizon becomes its holographic screen when its horizon encodes information.

Wheeler understood this process is similar to what an observer observes on a computer screen. The computer screen encodes bits of information on pixels, which is encoded in a binary code of 1's and 0's. Whatever the observer observes is a form of information that can be reduced to bits of information encoded on the computer screen. These forms of information are projected like images from the screen to the observer's point of view outside the screen and are animated in the flow of energy that flows through the computer. Everything the observer observes is a projected form of information animated in the flow of energy. Wheeler called this idea "*It from bit*".

Where do the laws of physics come from? The holographic principle gives a perfectly good scientific answer. The laws of physics are like the operating system or computational rules that govern the operation of this computer-generated virtual reality. This turns out to be fairly easy to show from the holographic principle. The laws of physics that govern whatever appears to happen in any bounded region of space can be easily deduced from the way qubits of information are encoded on the bounding surface of that space and the energy inherent in the observer's accelerated frame of reference that gives rise to that bounding surface as the observer's event horizon. The laws of physics are not really anything fundamental, but are more like a thermal average description of what appears to happen when things are near thermal equilibrium, like a thermodynamic equation of state. Both Einstein's field equations for the space-time metric, which is the law of gravity, and all quantum field theories that give a representation of particle physics, can be understood to arise as thermal average descriptions of what appears to happen in some bounded region of space. In physics, these are called effective field theories. The more fundamental description of what appears to happen in any bounded region of space is the way qubits of information are encoded on the bounding surface of that space, which can always be understood as an accelerating observer's event horizon that becomes its holographic screen when its horizon encoded qubits of information, and the energy inherent in that accelerated motion.

The idea of the observer's holographic screen as similar to a computer screen is the essential nature of the holographic principle. Information is encoded on the observer's holographic screen in terms of qubits of information. The big question was how this information encoding occurs when the holographic screen is a de Sitter cosmic horizon.

Tom Banks discovered such an explanation, which was initially called matrix theory, and later on was called holographic space-time. Banks and Susskind are colleagues, and collaborated on the initial paper on matrix theory before the AdS/CFT correspondence was discovered. Their respective interests then diverged as Banks became focused on de Sitter space while Susskind focused his attention on anti-de Sitter space. Banks assumed the observer's holographic screen is ultimately defined on a de Sitter cosmic horizon. This is inherently an observer-centric and observer-dependent formulation of the holographic principle since the observer is at the central point of view of its own holographic world that is defined on its own de Sitter cosmic horizon.

The nature of an event horizon only requires the idea of an observer that undergoes accelerated motion and the invariance of the speed of light, which is the maximal rate of information transmission in three dimensional space and in a computer network. A light ray that originates on the other side of the observer's event horizon can never reach the accelerating observer as long as the observer continues to undergo its accelerated motion. The holographic principle is built on this idea of accelerated motion, whether that accelerated motion arises from the observer's own accelerated motion or the accelerated expansion of space.

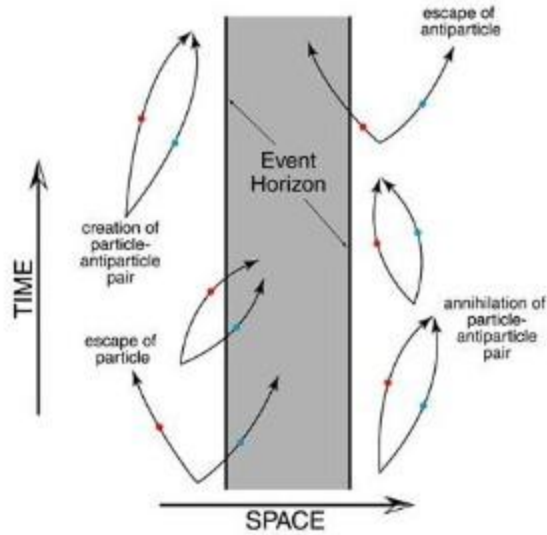
The basic idea of the holographic principle is that the observer's event horizon, whether a de Sitter cosmic horizon or a Rindler event horizon or some combination of the two, becomes its holographic screen when qubits of information are encoded on its horizon. The most general way to formulate the holographic principle is in terms of a matrix model, which is how Tom Banks has formulated the holographic principle. Unlike the AdS/CFT correspondence that only applies in anti-de Sitter space, the idea of a matrix model can also be formulated in de Sitter space.

The upshot is that an observer's event horizon can become its holographic screen when qubits of information are encoded on its horizon, which is mathematically formulated in terms of a matrix model. The way the holographic works is that each qubit of information is encoded on a Planck size area element defined on the surface of the horizon, like bits of information encoded on the pixels of a computer screen. The number of qubits of information encoded on the horizon is given in terms of the surface area, A , of the horizon as $n=A/4\ell^2$, where the Planck area, $\ell^2=\hbar G/c^3$, is given in terms of Planck's constant, the gravitational constant and the speed of light. Since a qubit of information is the smallest amount of measurable information that can be measured, this explains why

a Planck-size event horizon, which encodes a single qubit of information, is the smallest possible event horizon. Larger event horizons encode more qubits of information.

The idea Tom Banks had about formulating the holographic principle in de Sitter space in terms of a matrix model, where the observer is at the central point of view of its own holographic world that is defined in terms of qubits of information encoded on its own holographic screen that arises as its cosmic horizon, is a natural extension of the idea that Ted Jacobson had about the thermodynamics of space-time. Jacobson considered an accelerating observer and its Rindler horizon. Jacobson assumed that the observer's world was defined in terms of qubits of information encoded on the observer's Rindler horizon. In terms of thermodynamics, this way of encoding qubits on the observer's horizon is the nature of holographic entropy. The qubits are the fundamental dynamical degrees of freedom for the observer's world. In terms of qubits as the fundamental basis for quantum theory, a qubit is the nature of entropic information. Holographic entropy is simply given in terms of the number of qubits encoded on the observer's event horizon as $S=kn$. Jacobson needed one more piece of the puzzle, which is the amount of thermal energy carried by each dynamical degree of freedom at thermal equilibrium. Thermodynamics tells us that at thermal equilibrium, each dynamical degree of freedom carries the same amount of thermal energy, which is given in terms of temperature as $E=kT$. In a holographic world, these dynamical degrees of freedom are qubits of information encoded on the observer's event horizon. Jacobson was able to specify this thermal energy in terms of the Unruh temperature of the Rindler horizon, which is simply given in terms of the observer's acceleration, a , as $kT=\hbar a/2\pi c$.

The Unruh temperature is given in terms of the thermal energy of the thermal radiation carried away from the observer's event horizon, $E=kT$, as observed by the accelerating observer. This emitted thermal radiation is also called Hawking radiation. The Unruh temperature is calculated in quantum field theory in terms of the separation of virtual particle-antiparticle pairs at the event horizon as observed by the accelerating observer. Virtual particle-antiparticle pairs are created out of nothing due to quantum uncertainty in energy, and normally annihilate back into nothing in a short period of time, but at the event horizon they can appear to separate from the point of view of the accelerating observer, which gives the event horizon an apparent temperature due to the apparent emission of thermal radiation from the horizon that carries heat to the observer.



Hawking Radiation

With these values for the holographic entropy and the Unruh temperature of the event horizon, Jacobson was then able to use the laws of thermodynamics, which says that $\Delta E = T\Delta S = kT\Delta n$, to derive Einstein's field equations. Since holographic entropy, $S = kn$, is given in terms of the number of qubits encoded on the surface area of the event horizon as $n = A/4\ell^2$, this simply says that at thermal equilibrium, as the event horizon changes in surface area, the amount of thermal energy inherent in the observer's holographic world also changes since there is a change in the number of qubits of information encoded on the event horizon. At thermal equilibrium, each qubit carries the same amount of thermal energy given in terms of the observer's own acceleration as $E = kT = \hbar a/2\pi c$. This simple relationship allowed Jacobson to derive Einstein's field equations for the space-time metric from the laws of thermodynamics. As the surface area of the observer's event horizon changes, there is a corresponding change in the amount of thermal energy inherent in the observer's holographic world, which corresponds to a change in the dynamical curvature of the space-time geometry of that holographic world as is specified by Einstein's field equations for the space-time metric.

$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} = 8\pi GT_{\mu\nu} - \Lambda g_{\mu\nu}$$

Einstein's Field Equations for the Space-time Metric

Einstein's field equations for the space-time metric are not really fundamental, but are more like a thermodynamic equation of state that describes gravitational events in the

observer's holographic world when things are near thermal equilibrium. Once we have Einstein's field equations, we can then deduce all the field equations for the standard model of particle physics using the usual unification mechanisms of supersymmetry and extra compactified dimensions of space. At the level of field theory, the final result of unification looks like 11-dimensional supergravity, just as it does in the AdS/CFT correspondence. All the quantum fields that correspond to particle physics arise from Einstein's field equations as extra components of the space-time metric due to supersymmetry and extra compactified dimensions of space. Just like Einstein's field equations, none of these quantum fields are really fundamental, but instead only have the limited validity of thermodynamic equations of state that describe events in the observer's holographic world when things are near thermal equilibrium.

This explanation clears up one of the big puzzles of quantum field theory. We can use quantum field theory to calculate the Unruh temperature of an event horizon because we are assuming thermal equilibrium, and quantum field theory as a thermodynamic equation of state is valid for small quantum fluctuations around thermal equilibrium. On the other hand, we cannot use quantum field theory to calculate the cosmological constant, which is often mistakenly equated with vacuum energy. The idea of vacuum energy as arising from large quantum fluctuations of a quantum field is invalid since that idea implies that things are not at thermal equilibrium. The cosmological constant, as the dark energy that gives rise to the accelerated expansion of space, is not at thermal equilibrium, and so quantum field theory is not a valid way to calculate it.

In some sense, the cosmological constant is a boundary condition, since it sets the distance to the observer's cosmic horizon, which is the ultimate boundary of its own holographic world. That holographic world is defined by the way qubits of information are encoded on the observer's cosmic horizon. The radius, R , of the observer's cosmic horizon is given in terms of the cosmological constant, Λ , as $(R/\ell)^2 = 3/\Lambda$. Before we can construct a holographic world, we have to assume a value for the cosmological constant for that world. We can't use the laws of physics to calculate the cosmological constant of that world since the laws of physics, like the laws of gravity, electromagnetism and the nuclear forces, only emerge in that world as thermodynamic equations of state when things are near thermal equilibrium and only are valid at thermal equilibrium. We have to assume a value for the cosmological constant before we can construct that holographic world, and only then do the laws of physics emerge in that world as thermodynamic equations of state when things are near thermal equilibrium.

This problem is related to all modern theories of the big bang event. In inflationary cosmology, it's assumed that the cosmological constant must transition from a higher to a lower value early in the history of the universe. The dark energy of the cosmological constant is what puts the *bang* in the big bang event. The laws of physics not only are unable to explain the value of the cosmological constant, but also can't explain how the

cosmological constant transitions from a higher to a lower value. The cosmological constant is a boundary condition that sets the distance to the observer's cosmic horizon, and its value must be set before the observer's holographic world can be constructed.

Before an observer's holographic world can be constructed, we have to assume two things. We have to assume that an observer exists at the central point of view of its own holographic world. We also have to assume that the observer undergoes some kind of accelerated motion, whether that of an observer accelerating through space-time or the accelerated expansion of space, which defines the observer's accelerated frame of reference that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. Science has no explanation for where the observer comes from or where the energy of the observer's accelerated motion comes from. There is no scientific explanation for where the perceiving consciousness of the observer comes from or where the energy of the observer's accelerated motion comes from. There is no scientific explanation for what sets the value for dark energy and the cosmological constant. These things have to be assumed before the observer's holographic world can be constructed and the laws of physics can emerge in that world.

The holographic principle is telling us that every observer observes events in its own holographic world from the central point of view of that world. Although those events appear to occur in three dimensional space and to be governed by the laws of physics as formulated in three dimensional space, in reality, the information for all those events is reducible to qubits of information encoded on the observer's own event horizon, which is the two dimensional bounding surface of that space. The observer's event horizon arises due to its own accelerated motion and becomes its holographic screen when its horizon encodes qubits of information. Everything the observer can observe in its own holographic world is a form of information that's reducible to qubits of information encoded on its own holographic screen. Those forms of information are projected like images from the observer's screen to its own point of view at the center of its own holographic world. Even the flow of energy that animates the images can be understood in terms of the energy of the observer's own accelerated motion.

In the sense of the subject-object relation of perception, the observer is the subject and its object of perception is a form of information that is reducible to qubits of information encoded on its holographic screen. Perception only occurs as that form of information is projected like an image from the observer's screen to its central point of view. The observer not only perceives the form of things, but also the flow energy that animates things. There is only an illusion that the form of a person that appears in the observer's world is able to perceive things in that world. The form of a person is only the central form of information that appears in the observer's world, like the form of an avatar that appears in a computer-generated virtual reality world. In reality, there is no person, only

the projected and animated images of a holographic virtual reality world that only appears to exist due to the observer's own accelerated motion.

This illusion that the form of a person that appears in the observer's world is able to make local observations of things in that world is why the concept of local realism is not a valid concept. Observation is never really local in nature, but rather is global in nature as an observer makes observations of things in its own holographic world. The observer can only be understood as the central point of view of that world, and the observable form of all things are forms of information projected like images from the observer's own holographic screen to its central point of view. Perception is holographic projection.

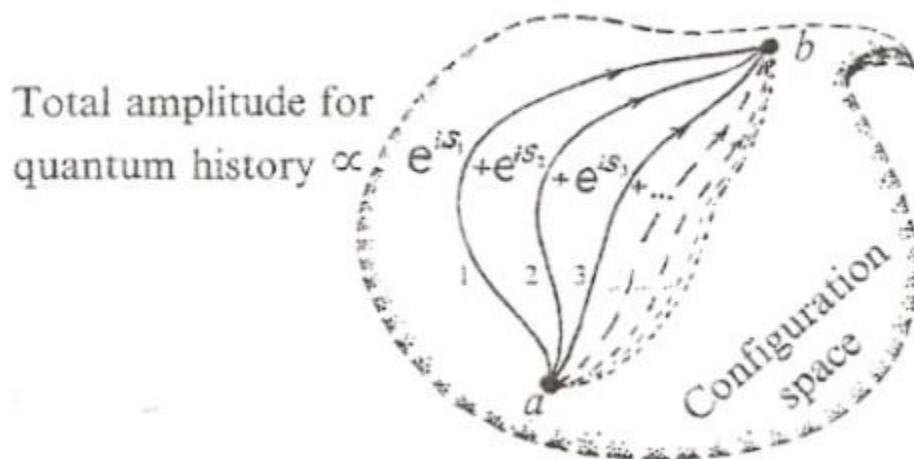
There is only an illusion that the central form of a person that appears in the observer's holographic world is able to perceive things in that world. That illusion is created as the observer emotionally identifies itself with its emotionally animated central personal form. The central form of a person is always emotionally animated relative to all other forms that appear in the observer's holographic world. The observer only emotionally identifies itself with that emotionally animated personal form due to its perception of feelings of emotional self-limitation to that emotionally animated personal form as that personal form is emotionally animated relative to all other forms that appear in its world.

In no significant way is this state of affairs different from an observer's perception of the projected and animated images of a computer-generated virtual reality world that's being displayed on a computer screen, like the kind of virtual reality depicted in the movie the Matrix. In effect, the observer itself creates its own quantum computer that gives rise to the appearance of its own computer-generated holographic virtual reality world. The quantum computer is created due to the observer's own accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. The laws of physics for the observer's holographic world are like computational rules that govern the operation of the quantum computer. Even the energy that flows through the quantum computer can be understood as arising from the energy of the observer's own accelerated motion.

The holographic principle is a way of reformulating quantum theory in terms of the observer. Instead of a wave-function that describes the behavior of point particles in some space-time geometry, the holographic principle reformulates quantum theory in terms of an accelerating observer and its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. Everything in the observer's holographic world, which not only includes all the point particles of that world, but also the space-time geometry of that world, can be reduced to qubits of information encoded on the screen. Everything is a form of information, and the perception of anything is like an image projected from the screen to the observer's own point of view.

Even the perception of the flow of energy, which arises from the observer's own accelerated motion, can be understood in terms of the animation of the images.

In the ordinary quantum theory and quantum field theory of point particles, the quantum state can either be formulated in terms of a wave-function or as a sum over all possible paths. Each path is weighted with a probability factor that depends on the action for that path, $P = \exp(iA/\hbar)$, where the action is given in terms of kinetic and potential energy as an integral along the path, $A = \int dt(KE - PE)$. This probability factor is the essence of the wave-function and specifies wave motion in terms of Euler's formula $\exp(i\theta) = \cos\theta + i\sin\theta$. The wave-function, $\psi(x,t)$, specifies the quantum probability with which a point particle can be measured at position x at time t as the particle follows its trajectory $x = x(t)$. The most likely path in terms of quantum probability, which is the classical path, is the path of least action, which is like the path that measures the shortest possible distance between two points in a curved space-time geometry. In relative theory, the analogue of the action is called the proper-time, and least action maximizes proper-time.



Quantum State as the Sum over all Possible Paths

Quantum theory, whether formulated in terms of the wave-function or as a sum over all possible paths, allows for the expression of potentiality. A path is never determined, but can only be specified in terms of its quantum probability. Classical physics only seems to be deterministic because it only considers the path of least action. At every decision point, there is always a choice to be made about which path to follow. The expression of potentiality is inherent in the choices we make about which path to follow.

The holographic principle totally reverses this process of quantization. Instead of a wave-function, we start with the idea of an accelerating observer and its event horizon, which becomes its holographic screen when qubits of information are encoded on the horizon. The expression of potentiality arises from quantum entanglement, which is a

consequence of the way qubits are defined in terms of the eigenvalues of a matrix that in turn is defined on the surface of the event horizon. By their very nature, entangled qubits allow for the expression of potentiality, which is the essential difference between classical and quantum computing. Fundamentally, quantum theory is based upon the mathematical structure of qubits encoded on an accelerating observer's event horizon. The wave-function is not fundamental, but is a derived concept that arises from the laws of thermodynamics when things are near thermal equilibrium. Einstein's field equations for the gravitational space-time metric, Maxwell's equations for the electromagnetic field, the Yang-Mills equations for the nuclear fields, and Dirac's equation for the electron and quark fields are all examples of wave-functions, but only have the limited validity of thermodynamic equations of state that describe perceivable events in a holographic world when things are near thermal equilibrium.

There's one last point to make about the nature of a holographic world. The problem has to do with time. What gives rise to the perception of time? The perception of three dimensional space has a natural explanation in a holographic world since a holographic screen is a two dimensional bounding surface of space that projects holographic images from the screen to the observer's central point of view, but what gives rise to the perception of time? What animates the images? There is no scientific answer anywhere in theoretical physics that explains where the perception of time comes from.

In relativity theory, the only valid definition of time is the observer's own proper-time, which is the only invariant quantity of relativity theory. Ordinary quantum theory is based on the idea of unitary time evolution of the quantum state, but this cannot generalize to relativity theory since there is no definition of time that all observers will agree upon in a dynamically curved space-time geometry with gravity. There is no valid notion of time translation invariance in a dynamically curved space-time geometry with gravity. Only in flat Minkowski space, where there is no effect of gravity, is there a valid notion of time translation invariance that allows different observers to agree upon the same definition of time. The whole concept of ordinary quantum theory is based upon the idea of unitary time evolution, but breaks down in a dynamically curved space-time geometry with gravity. This is a big problem since unitary time evolution is the fundamental defining principle of ordinary quantum theory. There's a direct path from the assumption of unitary time evolution to the sum over all possible paths formulation of quantum theory to the Feynman diagram formulation of quantum field theory, which gives rise to the point particle formulation of the standard model of particle physics.

$$|\Psi(t)\rangle = e^{-i\hat{H}t} |\Psi(0)\rangle$$

Unitary Time Evolution of the Quantum State

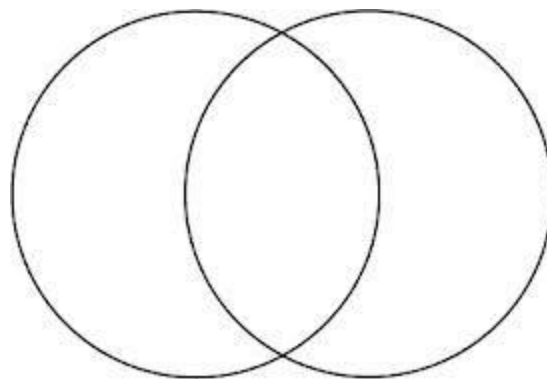
What happens when unitary time evolution breaks down, as it must break down in a dynamically curved space-time geometry with gravity? The answer of course is the holographic principle, which does not assume unitary time evolution. Unitary time evolution is only approximately valid when things are near thermal equilibrium and quantum fields can be defined as thermodynamic equations of state. The only really valid definition of time is the observer's own proper-time, but how is that proper-time defined? We have the idea that the observer carries a clock with itself. That clock undergoes some kind of periodic motion, like the swinging of a pendulum, or a light clock with a light ray bouncing back and forth between two mirrors. The problem is, how can the observer carry a clock with itself if the observer is only a point of view at the center of its own holographic world? What is actually undergoing periodic motion? The answer of course is the observer's own accelerated motion. The perception of time, in the sense of the observer's own sense of proper-time, arises from the observer's own accelerated motion. It is the observer's own accelerated motion that is energizing and animating all the projected images of the observer's own holographic world.

The holographic principle also resolves all the measurement paradoxes of quantum theory, like the Schrodinger cat and the Wigner friend paradoxes, since every observer observes events in its own holographic world as defined by the way qubits of information are encoded on its own holographic screen, which is how the quantum state of that world is formulated. Different observers observe events in their own holographic world from the central point of view of that world. The quantum state of every observer's world is defined by the way qubits of information are encoded on its own holographic screen that arises as its own event horizon due to its own accelerated motion. Different observers do not observe events in the same world. At most, there can be information sharing between observers when their respective holographic screens overlap like a Venn diagram. The holographic principle also resolves the measurement paradoxes of quantum entanglement and spooky action at a distance since all the qubits of information that are encoded on the observer's own holographic screen are inherently entangled until an observation of its own holographic world is made. That observation is never a local phenomena, but rather a global phenomena that disentangles the

quantum state of the observer's entire holographic world. The simultaneous observation of different objects that appear to be separated in space in that world requires the disentanglement of the quantum state of that entire world.

This idea of how observation occurs fits in nicely with the holographic principle, which tells us that whatever appears to happen in that bounded region of space is like the holographic projection of an image from the screen and the animation of that image in the flow of energy that is inherent in the observer's accelerated frame of reference. The projected image is a form of information that can always be reduced to qubits of information encoded on the screen. That image is animated by the observer's own motion and is projected from the screen to the observer's central point of view as the observer perceives it. The animation and projection of those images is only possible because the observer is focusing its attention on its own computer-generated virtual reality as it plays the virtual reality game.

Each observer observes its own holographic world as the animated images of that world are projected from its own holographic screen to its central point of view. That screen always arises as an event horizon in the observer's accelerated frame of reference. How then do we explain a consensual reality shared by many different observers? The answer is information sharing. When multiple players play a computer-generated virtual reality game, with each player playing the game on its own computer screen, those players can share information as long as their computer screens are connected by the internet. In a similar way, different observers, each located at their own individual point of view, can share a consensual reality when their respective holographic screens overlap in the sense of a Venn diagram and share information. The accelerated point of view of each observer is surrounded by an observation limiting event horizon, which is a bounding surface of space that acts as a holographic screen. In quantum gravity, overlapping holographic screens naturally share information.



Information Sharing Between Overlapping Bounding Surfaces of Space

The key point of the holographic principle is that the observer's holographic screen only arises due to the observer's accelerated motion that gives rise to the observer's accelerated frame of reference. The observer is the point of perceiving consciousness at the center of its own holographic world that perceives the images projected from its own holographic screen to its central point of view. That holographic screen always arises as an event horizon in its accelerated frame of reference. The energy of that accelerated motion is what animates the projected images. The observer not only perceives the projected images, but also perceives the energy that animates the images. That energy arises from the observer's own accelerated motion. The projected images not only look real, but they also feel real as the observer perceives that animating energy.

Everything you can perceive, which not only includes the form of all things, but also the flow of energy that animates those forms, is no more real than the projected and animated images of a computer-generated virtual reality, just as depicted in the Matrix. Things not only look real as you perceive the images of things, but they also feel real as you perceive the flow of energy that animates the images of things. In reality, the form of those things are no more real than the protected and animated images of a computer-generated virtual reality game that you're playing. You play the game as you perceive the game. You play the game by focusing your attention on the game. Your focus of attention on the game is what allows you to perceive the game. Your focus of attention on the game is also what allows you to animate the game. It's the energy of your own motion as a moving point of perceiving consciousness that allows you to animate the game as you focus your attention on the game and perceive the game.

There's another aspect of your consciousness that needs to be discussed to fully understand how you play the game. When you focus your attention on the game, you not only animate the images of the game due to your own motion as a moving point of perceiving consciousness, but you also project the images from your own screen to your own point of view as you perceive the animated images. You project the images because you're illuminating the images with your own light of consciousness. The light of consciousness is what allows the images to become illuminated and projected from the screen back to your own point of view as you perceive them. In a way, this is like the light that is reflected from a mirror, or the light of a movie projector that projects the images of a movie from a movie screen to the point of view of an observer in the movie audience. You have to illuminate the images before they can be projected to your own point of view and you can perceive them. You illuminate them by shining the light of consciousness on them. You shine the light of consciousness on them as you focus your attention on them.

In this sense, you are a moving point of illuminating and perceiving consciousness that arises at a point of view as you perceive the projected and animated images of your

own holographic world. That world is defined on a holographic screen that arises as an event horizon due to your own accelerated motion. The screen is where all the qubits of information are encoded that characterize all the forms of things in that world. The forms are projected and animated images. You perceive the images of that world as you focus your attention on that world. The projected images of that world are only projected to your central point of view because you're illuminating them as you shine your own light of consciousness on them. The projected images of that world are only animated because you're animating them with the energy of your own motion. You only project, animate and perceive the images of that world because you focus your attention on the images. You have to focus your attention on the images to project, animate and perceive them.

We have one last important question to answer, which is the original question: Where does the observer come from? There must be a source of the observer. If we think of the observer as the perceiving consciousness present at the central point of view of its own holographic world, then there must be a source of this perceiving consciousness. The really big question is what is the source of the observer's consciousness?

The reason this is a big question is because the perceiving consciousness of the observer cannot arise from something that appears in the holographic world that the observer perceives, like the central form of a person that appears in that world. The source of consciousness cannot be an object in consciousness. Perception always occurs in a subject-object relation, where the observer is the subject and its object of perception is a form of information that appears in its holographic world. That object of perception cannot be the source of the observer's consciousness. To make that assumption would be to create a paradox of self-reference that would make the whole explanation logically inconsistent. Logical consistency of the explanation demands that the observer's consciousness cannot arise from something that it can observe.

The basic problem is that consciousness cannot be computational in nature as Roger Penrose has pointed out. In a holographic world, everything the observer can observe is a form of information that's reducible to qubits of information encoded on the observer's own holographic screen. All observable forms of information are computational since they can be reduced to qubits of information encoded on the observer's screen, but the observer's consciousness cannot be computational since it is what perceives the forms of information. The forms must be projected like images from the observer's holographic screen to its point of view outside the screen. Since the observer's consciousness exists outside the screen, it cannot be reduced to qubits of information encoded on the screen without creating a logically inconsistent paradox of self-reference. This is the basic idea underlying the Godel incompleteness theorems. An observer that observes forms of information that are being displayed on a computer screen from its point of view outside the screen cannot be reduced to bits of information encoded on the computer screen,

and so the observer's consciousness cannot be computational in nature. The forms of information are all computational in nature, but not the observer's consciousness.

If the source of consciousness cannot arise from something that the observer can perceive in a subject-object relation of perception, then where does the observer's consciousness come from? If the source of consciousness cannot arise from an object of perception, then where does the observer's consciousness come from? This is the stumbling block that has prevented all real progress in terms of understanding the holographic principle. This is a stumbling block since we have to begin by assuming the a priori existence of a source for the observer's consciousness before we can discuss how its holographic world appears to come into existence. That source of the observer's consciousness must exist prior to the apparent existence of its holographic world.

This problem arises from how a holographic world is created. A holographic world only appears to come into existence due to an observer's accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. The observer itself can only be understood as the perceiving consciousness present at the central point of view of its own holographic world that is able to undergo accelerated motion, which gives rise to its event horizon. To make sense of this scenario, we have to begin with the assumption of the existence of a source for the observer's consciousness. There must be a source of the observer's perceiving consciousness that has an a priori existence that exists prior to the apparent existence of its holographic world. Before the observer's holographic world can appear to come into existence, the source of the observer's consciousness must exist.

This is a stumbling block to any real understanding of the holographic principle because the assumption of the a priori existence of a source of the observer's consciousness smacks of spiritualism, which is exactly what it is. Virtually everybody that works in the scientific field of the holographic principle is a physicalist, and the idea of a spiritual reality that is beyond physical reality is anathema to the physicalists. Lenny Susskind, Tom Banks and Roger Penrose are all physicalists, and they all vehemently deny the existence of a spiritual reality that is beyond physical reality. The big problem that they face is that they also accept that physical reality is constructed as a holographic world.

Once you accept that physical reality is constructed as a holographic world, you're in a real pickle when you try to understand the nature of consciousness. The source of consciousness cannot be an object in consciousness. In the sense of a subject-object relation of perception, the source of the observer's perceiving consciousness cannot be an object of perception that appears in its holographic world, which is understood as a form of information that's reducible to qubits of information encoded on its own holographic screen that arises as an event horizon due to its accelerated motion as a point of consciousness at the center of its own holographic world. Where does that

consciousness come from? It's fine to say that the subject-object relation of perception arises as a self-excited circuit, but we still have to explain the source of consciousness.

The physicalists will never really understand the holographic principle because they deny the existence of a spiritual reality beyond physical reality. That spiritual reality is the only possible source of consciousness. There is no other possible explanation for the source of consciousness. All other possible explanations suffer from the logical inconsistency of a paradox of self-reference. If we want to maintain logical consistency, we have to assume the existence of a source of consciousness that is beyond physical reality, which is best called spiritual reality. In the words of Sherlock Holmes, when you've eliminated everything that is impossible, whatever remains, however improbable it seems, must be the truth.

What exactly is this spiritual reality beyond physical reality that is the source of the observer's consciousness? The simple answer is that this spiritual reality is the primordial nature of existence. It is what exists when everything else disappears from existence. The observer's holographic world can only disappear from existence when the observer stops accelerating. When the observer's accelerated motion comes to an end, the observer enters into an ultimate state of free-fall. When the observer enters into an ultimate state of free-fall, the observer no longer has an event horizon that encodes qubits of information and becomes its holographic screen. In an ultimate state of free-fall, everything in the observer's holographic world disappears from existence from its own point of view, and nothing remains.

The nothingness that remains when the observer's holographic world disappears from existence is called the void. The void is the source of the observer's consciousness, which is a differentiated state of consciousness that arises at the central point of view of its own holographic world. That holographic world only appears to come into existence from the observer's point of view due to the observer's accelerated motion relative to the motionless void. The existence of the void is timeless and unchanging, which is to say it is motionless. The void is unlimited. It has no boundary. The bounding surface of an event horizon can only arise from the point of view of an accelerating observer. The void is also undivided. As the source of the observer's perceiving consciousness, the void can only be understood as undifferentiated consciousness.

In reality, the void cannot be conceptualized except in terms of negation as absolute nothingness, which is unlimited, undivided and unchanging. Only a holographic world that is characterized by limitation, division and change can ever be conceptualized. That conceptualization is the very nature of a holographic world, which is characterized by forms of information and the flow of energy. As absolute nothingness, the void is formless. As absolute nothingness, the void is timeless and motionless. The course of time, like the flow of energy, only appears to exist in an observer's holographic world

due to the observer's own accelerated motion relative to the motionless void that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. In the absolute nothingness of the void, there are no events and nothing ever appears to happen. There is only absolute nothingness.

The void is the primordial, timeless nature of existence. The course of time, like the flow of energy, only appears to exist in an observer's holographic world. Forms of information only appear to exist in an observer's holographic world. The void, as the source of the observer's perceiving consciousness, is the nature of timeless being, which can only be understood as undifferentiated consciousness. The individual consciousness of the observer, present at the central point of view of its own holographic world, is the nature of individual being, which is called *I Am* or the *Self*. As absolute nothingness, the void is the nature of undivided and unlimited timeless being, which is also called *No-self*.

In some mysterious way, the individual consciousness of the observer, present at its own point of view, must separate itself from the undifferentiated consciousness of the void before its holographic world can appear to come into existence. Individual consciousness only refers to the observer's individual point of view. The observer's holographic world only appears to come into existence from its own point of view when the observer begins to undergo accelerated motion relative to the motionless void, which is how its event horizon arises that becomes its holographic screen when qubits of information are encoded on its horizon. When the observer's accelerated motion comes to an end in an ultimate state of free-fall, its holographic world disappears from existence from its own point of view, and only the void remains. In the sense of a dissolution, the individual consciousness of the observer, present at its own point of view at the center of its own holographic world, dissolves back into the nothingness of the undifferentiated consciousness of the void like a drop of water that dissolves back into the ocean. Individual being dissolves back into its source of pure undivided being. This experience of dissolution is called spiritual enlightenment.

There are still a few loose ends that need to be tied together regarding the holographic principle. Just as the undifferentiated consciousness of the void is the source of the individual perceiving consciousness of the observer present at the central point of view of its own holographic world, the void is also the source of the energy that underlies the observer's accelerated motion that gives rise to its event horizon, and the source of the information encoded on the observer's event horizon that becomes its holographic screen. The void as the source of all these things helps clear up the mystery of the normal flow of thermal energy through the observer's holographic world, which is closely related to the mystery of the cosmological constant and the big bang.

The best theory we have of the big bang is called inflationary cosmology, which assumes that early in the history of the universe the cosmological constant transitions

from a higher to a lower value. The value of the cosmological constant sets the size of the observer's holographic world in terms of the radius of its cosmic horizon due to the accelerated expansion of space. The cosmic horizon defines the limits of the observer's own observable world since nothing is observable beyond the limits of its horizon. The larger the value of the cosmological constant, Λ , the smaller the radius, R , of the observer's cosmic horizon, as $(R/l)^2=3/\Lambda$. Current observation indicates the value of Λ is about 10^{-122} , which corresponds to a radius of the observer's cosmic horizon of about 40 billion light years. In terms of thermal energy, the smaller the radius of the observer's cosmic horizon, the higher its Unruh temperature, as $kT=\hbar c/2\pi R$.

Early In the history of the big bang, the cosmological constant took on a very high value corresponding to a small radius of the observer's cosmic horizon and a high Unruh temperature. Inflationary cosmology assumes that the cosmological constant transitions from a higher to a lower value, which increases the radius to the observer's cosmic horizon and lowers its Unruh temperature. By this mechanism, the observer's holographic world appears to increase in size. Simultaneously, this allows heat to flow from hotter to colder objects as the Unruh temperature decreases, which explains the normal flow of thermal energy through the observer's holographic world. The normal flow of thermal energy is literally directed in the direction of the accelerated expansion of space as the cosmological constant transitions to a lower value and the observer's holographic world increases in size and cools in temperature.

This expansion also allows entropy to increase as the observer's cosmic horizon increases in radius and surface area, which allows more qubits of information to be encoded on the horizon. This increase in entropy as heat flows in a thermal gradient is the nature of the second law of thermodynamics, which says that forms of information tend to become more disordered due to the randomizing effects of the flow of thermal energy as heat flows from hotter to colder objects. The disorganizing effects of thermal disorder are always counterbalanced by the organizing effects of coherent organization as forms hold together, but eventually thermal disorganization wins out and forms fall apart. The flow of heat in a thermal gradient also explains the nature of time's arrow as things tend to become more thermally disordered. Time's arrow is literally directed in the direction of the accelerated expansion of space and the expansion of the observer's holographic world. When the cosmological constant transitions to its final value of zero, the radius of the observer's cosmic horizon increases to infinity and its Unruh temperature cools to absolute zero. When the flow of heat ultimately comes to an end, the course of time also comes to an end, which is called the *heat death* of the universe.



Normal Flow of Thermal Energy through the Observer's Holographic World

There is a big puzzle in this scenario that does not have a scientific explanation. How exactly is the value of the cosmological constant set and what allows for its transition to a lower value? In terms of the holographic principle, there is no scientific answer. In some sense, the value of the cosmological constant is a boundary condition that sets the conditions for the construction of a holographic world. Inflationary cosmology is based on quantum field theory, but quantum field theory cannot explain the nature of the cosmological constant since all quantum field theories only arise in a holographic world as thermodynamic equations of state that only describe events in that world when things are near thermal equilibrium. We have to assume a value for the cosmological constant before we can even construct that holographic world and discuss the laws of physics in that world as formulated in terms of field theories.

In the same way, there is no scientific explanation in terms of the holographic principle for why the cosmological constant transitions to a lower value. Each transition of the cosmological constant would in effect create a new big bang event, which occurs when the universe is far away from thermal equilibrium, and unlike the Unruh temperature, which assumes thermal equilibrium, cannot be calculated in quantum field theory, which is only valid for small fluctuations around thermal equilibrium. Theoretical physics can never explain the value of the cosmological constant or why it transitions to a lower value in terms of the holographic principle since we have to assume a value for the cosmological constant before we can construct a holographic world. In the sense of a boundary condition, the cosmological constant is what sets the radius of the observer's cosmic horizon, which is the bounding surface of space that sets the limits of the observer's own observable holographic world.

Just as the undifferentiated consciousness of the void in some mysterious way is the source of the individual consciousness of the observer at the central point of view of its

own holographic world, the void is also the source of the dark energy that's inherent in the cosmological constant, which must take on a non-zero value before the observer's holographic world can appear to come into existence. The dark energy of the cosmological constant is ultimately what energizes the observer's own holographic world and puts the *bang* in the big bang event. The dark energy of the cosmological constant is also what gives rise to the observer's cosmic horizon that becomes its holographic screen when qubits of information are encoded on the horizon. The void is also the source of this information encoding. In some mysterious way, the whole thing begins as the undifferentiated consciousness of the void differentiates or focalizes itself into the individual consciousness of the observer at the center of its own holographic world, expresses the dark energy that underlies the accelerated expansion of space that places the observer in an accelerated frame of reference and gives rise to the observer's cosmic horizon, and encodes qubits of information on the observer's cosmic horizon that becomes its holographic screen. It all has to begin with the void. The void is the source of the whole thing. The void is the nature of the spiritual reality that is beyond the physical reality of an observer's holographic world. There is no scientific explanation for the creation of the whole thing other than to call it God's will.

Ultimately, the individual consciousness of the observer must return to its primordial state of undifferentiated consciousness. Individual being must reunite itself with pure undivided being. Individual consciousness, present at the central point of view of its own holographic world, must dissolve back into its source of undifferentiated consciousness like a drop of water that dissolves into the ocean. This dissolution always occurs in an ultimate state of free-fall as the accelerated motion of the observer's point of view relative to the motionless void comes to an end. In that dissolution, the course of time and the flow of energy come to an end. In that dissolution, the observer's holographic world disappears from existence from its own point of view and nothing remains. That nothingness is the nature of timeless being and the primordial nature of existence.



Nothingness

Why isn't string theory a fundamental description of reality? The answer is string theory is computational, and can only apply to the computational construction of a holographic world. String theory, like field theory, only applies at the level of a holographic world. String theory is closely related to field theory, which is seen in a 10-dimensional supersymmetric $SU(N)$ gauge theory generating string theory in the large N limit, and in the low energy limit of string theory being 11-dimensional supergravity. This connection explains why string theory is holographic. String theory, like field theory, only gives the computational rules that govern events in a holographic world. That computation arises from qubits of information encoded on a holographic screen, which arises as an observer's event horizon due to its own accelerated motion. When that acceleration comes to an end in an ultimate state of free-fall, all computation also comes to an end, and only the void remains. String theory, like field theory, cannot apply in the ultimate reality of the void that is beyond the computational virtual reality of a holographic world. The simple answer is that computation does not apply to the void. The void as the source of a computational holographic virtual reality world is beyond computation.

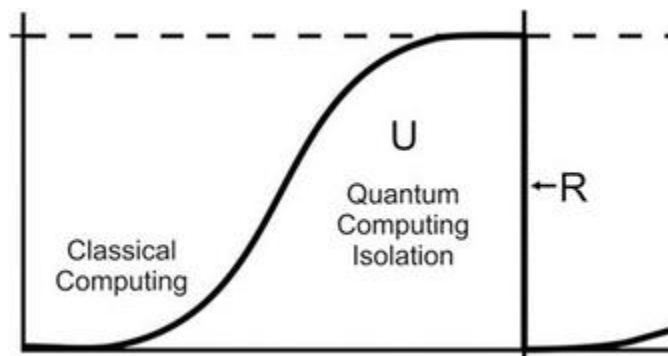
The physicalists deny the existence of this spiritual reality that is beyond computation. They only accept the physical reality of the world, but once you accept that the physical reality of the world is constructed as a holographic world, you're in a real pickle when you try to understand the nature of consciousness. The irony of course is that it's your own consciousness that understands things that's trying to understand its own nature.

A good example of a physicalist is Roger Penrose. Based on the Godel incompleteness theorems, Penrose understands that consciousness cannot be computational in nature. The nature of consciousness must be beyond computation. This is easily seen with the holographic principle, which describes the nature of a holographic world in terms of quantum computing. Everything the observer can observe in its own holographic world is a form of information that can be reduced to qubits of information encoded on its own holographic screen, which arises as an event horizon due to its own accelerated motion. Those forms are projected like images from the observer's screen to its own point of view outside the screen. The consciousness of the observer exists at a point of view outside the screen and cannot be computational in nature since it cannot be reduced to qubits of information encoded on the screen.

In spite of Penrose's understanding that consciousness must be beyond computation, Penrose is not willing to give up his physicalist mindset. Penrose is desperately searching for a physical explanation for consciousness, even though he acknowledges that this explanation cannot be computational in nature. Penrose has settled on the idea of objective reduction as the non-computational nature of consciousness. Penrose hypothesizes that there are complex structures in the brain that generate consciousness when they undergo a non-computational reduction of their quantum state. The idea of the reduction of the quantum state is based on the idea that the quantum state is highly

entangled in nature due to quantum entanglement, which is best understood in terms of the entanglement of qubits of information encoded on a holographic screen. The quantum state can be formulated in terms of a superposition or sum over all possible observable states. When an actual observation occurs, the sum over all possible observable states, which is a state potentiality, is reduced to an actual observable state.

Unitary time evolution tells us that the quantum state becomes increasingly entangled as it evolves between the initial and final states. In terms of qubits of information encoded on a bounding surface of space, like the conformal boundary of anti-de Sitter space or an observer's cosmic horizon in de Sitter space, the quantum state becomes increasingly entangled as it evolves in time and the qubits become increasingly entangled. The complexity of the quantum state only measures this degree of quantum entanglement of qubits, which become increasingly entangled over time from the initial disentangled state, which is a state of observation.



Unitary Time Evolution versus Reduction of the Quantum State

In the process of observation, the entangled quantum state of all possible observable states is disentangled, and only a single observable state is actually observed. Imagine a menu of possibilities from which you have to make an order. What actually shows up on your plate is what you ordered. Potentiality is inherent in having a choice about what to order. The quantum state can also be formulated in terms of a sum over all possible paths, and potentiality is inherent in the choice you make about which path to follow. When you follow a particular path, you make particular observations of whatever you observe as you follow that particular path. In this way, the entangled quantum state of potentiality is reduced to an actual observable state.

Each initial or final state in the sum over all possible paths of the quantum state is an observational event that disentangles the quantum state in the sense of a quantum state reduction, which is the nature of an observation. Roger Penrose has argued that observation must disentangle the quantum state through quantum state reduction.

In terms of the holographic principle, the initial state in the sum over all possible paths could be a state of thermal equilibrium, and yet the qubits will become increasingly entangled over time as the quantum state evolves from this initial disentangled state. Thermal equilibrium is best understood in terms of the equal partition of energy, which tells us that at thermal equilibrium, all the dynamical degrees of freedom for the system of interest carry the same amount of thermal energy given in terms of temperature as $E=kT$. For a holographic world, those dynamical degrees of freedom are qubits of information encoded on a bounding surface of space that arises as an observer's event horizon. If a total of n qubits encode information in a binary code, the maximal classical thermal entropy is given as $S=kn$, and there are a total of 2^n independent classical states, but at the quantum level, there are vastly more possible quantum states since the qubits can become entangled. Classical states are understood as eigenstates, while an entangled quantum state is a superposition of eigenstates. The classical states of qubits are the n eigenvalues of an $n \times n$ $SU(2)$ matrix. The entanglement of qubits only represents rotational invariance on the surface of a 2-sphere. Thermal equilibrium only reflects that all the qubits carry the same amount of thermal energy given in terms of temperature. The initial state could be a state of thermal equilibrium, and yet the quantum state will evolve in time in terms of complexity from that initial disentangled state due to an increase in the degree of entanglement of all the qubits. The complexity of the quantum state only measures this degree of quantum entanglement of the qubits, which increases between observational events that disentangle the quantum state. That evolution of the quantum state continues until the next observational event, which is the final state in the sum over all possible paths that disentangles the quantum state.

Quantum state reduction requires disentanglement of the entangled quantum state, which leads to an observation of an actual observable state. Penrose hypothesizes that this process occurs in the brain and generates consciousness as the quantum state of complex brain structures are reduced by a non-computational mechanism, like the fractal nature of Penrose tiling. Non-computational only means the process cannot be programmed on a computer. Reducing the quantum state by such a non-computational mechanism would allow consciousness to be physical but non-computational in nature.

The reason Penrose tiling cannot be programmed on a computer is because with each tiling, a decision must be made about where to place the tile, and that decision making is an aspect of consciousness, just like the decision about which path to follow. Penrose tiling cannot be programmed on a computer because each decision about where to place the next tile requires seeing the whole geometry, and no computer algorithm can see the whole nature of the geometry. Only consciousness can see the whole geometry.

Penrose tiling is indeed a non-computational mechanism, but only explains the nature of consciousness at the level of circular reasoning. We have to assume an aspect of consciousness, which is decision making, to explain the nature of consciousness. We

have to use our consciousness to explain the nature of our consciousness. What kind of an explanation is that? All attempts to explain the nature of consciousness in physical but non-computational terms are fraught with the same problem. We have to assume some aspect of consciousness before we can explain the nature of consciousness.

It appears there is no possible way to explain the nature of consciousness in physical terms unless we begin with the assumption that consciousness exists. There is no way of avoiding the *a priori* existence of consciousness. In terms of the holographic principle, we have to assume the existence of consciousness in terms of the observer and its accelerated motion before we can explain how an observer's holographic world appears to come into existence. Consciousness must exist prior to the apparent existence of an observer's holographic world. Once we understand the nature of physical reality in terms of an observer's holographic world, there is no way of avoiding the conclusion that consciousness must exist prior to the appearance of that holographic world.

Penrose's idea about consciousness being physical but non-computational in nature is an interesting idea, but this is not what enlightened beings tell us about the ultimate reality of consciousness, which is spiritual in nature. The reason Penrose is pushing this idea is because he is a physicalist and denies the existence of a spiritual reality beyond physical reality. The reason Penrose is a physicalist is because he only has the experience of physical reality. That's where all his concepts come from.

The business of philosophy, like theoretical physics, is about the conceptualization of reality. Philosophers, like theoretical physicists, conceptualize reality in terms of their ideas about reality. The problem is these concepts are based on their observations of the physical world, and the holographic principle tells us that the physical world is a holographic world that is constructed through quantum computing. The physical world is just like a computer-generated holographic virtual reality world that is being displayed on a computer screen. Everything observable in the physical world is a form of information that is reducible to qubits of information encoded on the screen, and these forms are projected like images from the screen to the point of view of the observer outside the screen. Even the flow of energy that animates the forms is perceived as the projected images are animated in the flow of energy. This construction of physical reality as a holographic world is due to quantum computing that occurs due to the observer's own accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon, which in effect creates the observer's own quantum computer. Even the flow of energy through the quantum computer arises from the observer's own accelerated motion.

The problem with both philosophy and theoretical physics is that the conceptualization of reality based on the observer's observations of the physical reality of a holographic world is fraught with logical contradictions. The number one logical contradiction is a

paradox of self-reference that arises when the observer emotionally identifies itself with the emotionally animated form of a person that appears in its holographic world. The person is only the central form of information that appears in that world, like the form of an avatar that appears in a virtual reality world displayed on a computer screen. Emotional self-identification of the observer with the form of a person only occurs due to its perception of emotional feelings of self-limitation to that personal form as that form is emotionally animated relative to all other forms that appear in its holographic world. This conceptualization of reality, based on the observer's observations of the physical reality of a holographic world, is doomed to fail due to these inherent logical contradictions.

In the Allegory of the Cave, Plato conceptualized the nature of reality not on the basis of any observations of the physical reality of the world, but based on the direct experience of the ultimate reality of consciousness. Plato described the physical reality of the world as a holographic world in terms of images displayed on the wall of the Cave, which Plato described as shadows cast on the wall of the Cave, just like the projected images of a virtual reality world displayed on a computer screen. The wall of Plato's Cave is a holographic screen that arises as an observer's event horizon due to the observer's own accelerated motion, which becomes its holographic screen when qubits of information are encoded on its horizon. Plato described prisoners who observe the projected images of that holographic world, which are the shadows cast on the wall of the Cave. The prisoner is an observer. The observer becomes a prisoner when it emotionally identifies itself with the central form of information of a person that appears in its own holographic world. This emotional self-identification occurs as the observer perceives emotional feelings of self-limitation to the form of the person as that personal form is emotionally animated relative to all other forms that appear in its holographic world. Plato also described the observer freeing itself from its emotional bondage of personal self-identification and ascending to the source of light that projects the images.



Plato based this conceptualization of reality not on any observations of the physical reality of a holographic world, but on the direct experience of the ultimate reality of

consciousness. The direct experience of the ultimate reality of consciousness is called spiritual enlightenment. Plato was able to conceptualize reality in this way because he underwent a process that led to spiritual enlightenment. When one becomes spiritually enlightened, one's individual consciousness, present as the observer at the central point of view of the holographic world one perceives, dissolves back into its source of undifferentiated consciousness like a drop of water that dissolves back into the ocean.

This undifferentiated source of consciousness is called the void. The void is the primordial nature of existence. The void is what exists when everything else disappears from existence. A holographic world can disappear from existence because that world is only created due to an observer's own accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon. Everything the observer can perceive is a form of information displayed on its own holographic screen. Those forms are projected like images from its screen to its own point of view at the center of its own holographic world. Even the flow of energy that animates the images arises from the observer's own accelerated motion. When that acceleration comes to an end in an ultimate state of free-fall, the observer no longer has an event horizon or a holographic screen, and so its holographic world disappears from existence from its own point of view. All the projected images of that world disappear from existence. Even the flow of energy that animates the images comes to an end. Even the individual consciousness of the observer, present at the central point of view of its own holographic world, dissolves back into its source of pure undifferentiated consciousness, like a drop of water that dissolves back into the ocean. All that remains in this state of dissolution is the timeless, undivided and unlimited existence of the void.

This ultimate state of dissolution always occurs in an ultimate state of free-fall, when the observer's own accelerated motion relative to the motionless void comes to an end. In an ultimate state of free-fall, one no longer has a holographic screen that displays images of one's own holographic world, and so that holographic world disappears from existence from one's own point of view. Only the void remains. In this ultimate state of dissolution, one's consciousness ascends to a higher level, and one sees the nature of one's own holographic world like a virtual reality movie being displayed on a computer screen as all the images of the movie are projected from the screen to one's own point of view and are animated in the flow of energy. This experience of the ascension of consciousness can be called depersonalization, since once one sees things in this way, one can no longer emotionally identify oneself with the central form of a person that appears in one's own holographic world. One can only know oneself to be a presence of consciousness at the central point of view of the holographic world that one perceives. Ultimately, one can only know the true nature of one's timeless existence as the void.



Nothingness

When one becomes spiritually enlightened, one not only sees one's own world from the ascended level of consciousness of the observer, like a movie that one is watching, but one also sees the nature of oneself as the observer at the central point of view of that holographic world. One sees how the accelerated motion of the observer relative to the motionless void is energizing and animating all the images of that world, like the images of movie. One also sees how the light of consciousness, emanating from the central point of view of the observer, is illuminating all the projected images of that world, like the light of a movie projector. One sees all of this from the perspective of the silence, stillness, emptiness and darkness of the void.

One sees how one's individual consciousness that is present at the central point of view of the holographic world one perceives, which is called *I Am* or the *Self*, is differentiated from the undifferentiated consciousness of the void, which is called *No-self*. One sees that ultimately, when one's individual consciousness dissolves back into its source of pure undifferentiated consciousness, the true nature of the *Self* is *No-self*. In an ultimate state of dissolution, there no longer is an experience of self and other. *All is One*.

The experience of self and other is only possible in a holographic world when the observer emotionally identifies itself with the central form of a person that appears in that world. This experience of self and other always occurs in a subject-object relation of perception, and only the observer can have that experience in its own holographic world when it emotionally identifies itself with the form of a person that appears in that world.

The vast majority of philosophers have absolutely no idea what Plato is describing in the Allegory of the Cave because Plato based his conceptualization of reality on the direct experience of the ultimate reality of consciousness, while almost all other philosophers can only develop their concepts based on their perception of a holographic virtual reality world, and that perception is fraught with logical contradictions about the nature of consciousness. The number one logical contradiction is a paradox of self-reference that

arises with the assumption that consciousness is personal in nature that directly leads to personal self-identification. This is why Plato is almost universally misunderstood.

Everyone who is not spiritually enlightened and who attempts to conceptualize reality only based on their observations of the physical reality of a holographic world is at a great disadvantage due to the logical contradictions that inevitably arise from that conceptualization. The number one logical contradiction is the paradox of self-reference that is created when the observer emotionally identifies itself with the form of a person that appears as the central form of information in its own holographic world, which is always emotionally animated relative to all other forms and leads to emotional feelings of self-limitation to that personal form. Plato did not have this disadvantage because of spiritual enlightenment, and was therefore able to conceptualize things based on the direct experience of the ultimate reality of consciousness.

This disadvantage one has of conceptualizing reality only based on the observations of the physical reality of a holographic world is best demonstrated by all the concepts that arise in philosophy and theoretical physics when one is not spiritually enlightened. When one is not spiritually enlightened, one typically takes the position of a physicalist, and one denies the existence of a spiritual reality beyond physical reality.

Only enlightened being have the experience of a spiritual reality beyond physical reality. When Plato conceptualized the Allegory of the Cave, this was based on the direct experience of the ultimate reality of consciousness. Plato was only describing what was being directly experienced, which is the ultimate reality of consciousness. There is no other way to describe this ultimate reality except in spiritual terms.

How exactly does quantum state reduction work at a spiritual level? How is the entangled quantum state disentangled? This question is closely related to the qualia problem. All of our physical theories about the nature of the world, including the holographic principle, are formulated in terms of quantities. In quantum field theory, we speak about the frequency or the wavelength of a photon, which is a quantum of electromagnetic radiation. With the holographic principle, we speak about qubits of information encoded on an observer's holographic screen. The holographic principle is more fundamental than quantum field theory because the qubits of information encoded on an observer's holographic screen are more fundamental in terms of the dynamical degrees of freedom that underlie all the events that can be perceived in the observer's holographic world than a photon of quantized electromagnetic radiation that appears in the observer's holographic world.

The problem is these physical descriptions of the observer's holographic world are given in terms of quantities, like the wavelength of a photon or a qubit of information, but that is not how we perceive the world. The qualia problem is pointing out that we do not

perceive quantities, like the wavelength of a photon, but qualities, like the color of light. The wavelength of a photon is a quantity, but when we perceive light, we perceive a quality, like the color red. There is no possible way any of our physical theories can make this transition from a quantity to a quality.

What is the solution to the qualia problem? The answer comes back to the problem of quantum state reduction. The quantum state is always an entangled state. At the level of quantum field theory, all the photons that appear in an observer's holographic world are entangled. At the level of the holographic principle, all the qubits of information encoded on an observer's holographic screen are entangled. At the level of qubits, quantum entanglement simply reflects that the qubits are defined in terms of the eigenvalues of a matrix that is defined on an observer's event horizon. Quantum entanglement simply reflects that the qubits are defined in a rotationally invariant way on the surface of the observer's event horizon.

When the observer makes an observation of its holographic world, the entangled quantum state for that world is disentangled. In terms of ordinary quantum theory, the entangled sum over all possible observable states is reduced to an actual observable state or the entangled sum over all possible paths is reduced to an actual path. In terms of qubits of information encoded on an observer's holographic screen, the entangled qubits are disentangled whenever an observation is made. Physical theories can never explain how observation occurs through disentanglement of the quantum state because by their very nature, all physical theories are computational in nature and can only describe quantities, not qualities. There is no possible way that a physical theory based on computation can ever change a quantity into a quality. There is no possible solution for the qualia problem in any of our physical theories about the physical world.

What is the solution for the qualia problem? The answer we have to accept is a spiritual solution, which is inherently a non-physical solution. The answer is inherent in the Allegory of the Cave when Plato described ascending to the source of the light. The light is what is projecting the shadows on the wall of the cave. What exactly is this light in spiritual terms? The answer is the light Plato refers to is the light of consciousness, which is spiritual in nature. The source of the light is the void, which is also spiritual in nature. The light of consciousness emanates from the observer's own point of view at the center of its own holographic world. The light of consciousness is what illuminates that world and allows for the projection of all images of that world from the observer's holographic screen to its central point of view as an observation of that world is made. The key aspect of the light of consciousness is that it must be focused, as in the focus of attention, whenever an observer makes an observation of its holographic world. Focusing the light of consciousness is like focusing the light of a movie projector. The light of consciousness allows for the projection of all the images of a holographic world.

In terms of the holographic principle, the light of consciousness is what disentangles the quantum state of the observer's holographic world as the observer makes an observation of that world. The nature of observation is holographic projection, which occurs as the observer perceives the form of things that appear in its own holographic world. Those forms are projected like images from the observer's holographic screen to its central point of view, and in the process of that holographic projection, the entangled quantum state of that world is disentangled. Since this holographic projection can only occur as the observer illuminates that world and focuses its own light of consciousness on that world, the process of disentangling the quantum state and observing that world is inherently a spiritual process that requires the light of consciousness.

At the level of decision making, as in the decision about which path to follow, focusing the light of consciousness is what allows a decision to be made, which also allows the quantum state to be disentangled. In that decision making process, the quantum state is disentangled as actual forms are perceived. At the level of an entangled quantum state, the forms of information are entangled and can only be characterized in terms of the numerical quantities of the entangled qubits encoded on an observer's holographic screen. When the quantum state is disentangled and actual forms are perceived, those perceived forms are characterized by qualities. The perception of the qualities of forms requires focusing the light of consciousness, which allows a decision to be made as the quantum state is disentangled and actual forms are perceived.

This is the only possible solution to the qualia problem. Although the quantum state of the observer's holographic world is formulated in terms of quantities, specifically in terms of qubits of information encoded on its holographic screen, the observer's observation of that world is always in terms of qualities, and those qualities are inherent in the way the light of consciousness must be focused in order to disentangle the quantum state and allow for the perception of forms in terms of their qualities. This is inherently a spiritual solution to the qualia problem.

How can we be certain that this is the correct solution? The answer is spiritual enlightenment, which is the direct experience of the ultimate reality of consciousness. When one becomes spiritually enlightened, one sees that the observer, which is present at the central point of view of its own holographic world, is animating that world through its own accelerated motion, just like the animated images of a movie. One sees that the observer's accelerated motion is what gives rise to its holographic screen that displays all the images of its holographic world, just like the images of a movie displayed on a screen. One sees that the light of consciousness that emanates from the observer's central point of view is illuminating that world and projecting all the images of that world from the observer's holographic screen to its central point of view, like the light of a movie projector. One sees this from the silence, emptiness and darkness of the void.



All Seeing Eye

Perception always occurs in a subject-object relation. The true nature of the subject is the observer at the central point of view of its own holographic world, which is called *I Am* or the *Self*, and the nature of all the objects of perception that the observer can perceive in its own holographic world are forms of information that appear in that holographic world. The forms are like images projected from the observer's holographic screen to its central point of view and animated in the flow of energy that arises from its own accelerated motion, which also gives rise to its holographic screen as its event horizon. The holographic principle tells us that the forms are all reducible to qubits of information encoded on the observer's own holographic screen.

The thing to be clear about is that the true nature of your *Self* is nothing more than the perceiving consciousness present at the central point of view of your own holographic world. You create your own world when your *Self* undergoes accelerated motion. That's how your own holographic screen arises as an event horizon. At the level of perceiving your own holographic world, you are that presence of consciousness at the central point of view of that world. Perception always occurs in a subject-object relation. The true nature of the subject is your *Self*, which is the presence of consciousness at the central point of view of your own holographic world. The nature of all the objects you perceive are forms of information encoded on your own holographic screen. Those forms are all reducible to qubits of information encoded on your own holographic screen and are projected like images from your own screen to your own point of view. Those forms are animated in the flow of energy that arises from your own accelerated motion.

Understanding the animation of the images only requires understanding the accelerated motion of the observer. Not only does the flow of energy through its own holographic world arise from the accelerated motion of the observer, but so too does the course of time through that world, which is perceived in terms of the animation of the forms. More difficult to understand is the projection of the forms. Understanding the projection of the forms requires another concept about the nature of consciousness, which is the idea of the light of consciousness. You are not only a point of perceiving consciousness at the center of your own holographic world that perceives the images of that world, but you are also the source of the light of consciousness that illuminates that world and projects all the images of that world from your own holographic screen to your own point of view. The light of consciousness illuminates the observer's own holographic world as it emanates from the observer's own point of view and projects all the images of its own holographic world from its holographic screen back to its own point of view.

The Nature of Delusion

If what you really are at the level of perceiving your own holographic world is a presence of perceiving consciousness at the central point of view of that world, then why do you have the impression of being a person in that world? The answer is called delusion. Each observer has its own personal form, which is the central form of information that appears in its own holographic world. The observer's personal form is called a body and is always emotionally animated relative to all other forms that appear in that world.

Delusion is created due to the way the observer's personal form is emotionally animated relative to all other forms that appear in its holographic world. As the observer perceives the flow of emotional energy that animates the form of its body relative to all other forms that appear in its holographic world, the observer feels emotionally self-limited to the form of its body due to its perception of feelings of emotional self-limitation to its body.

The observer's personal form is only the central form of information that appears in its own holographic world, but due to perceived feelings of emotional self-limitation to the form of its body, the observer mistakenly identifies itself with its body. The observer's mistaken self-identification with its body is purely an emotional self-identification due to perceived feelings of emotional self-limitation to its body. The expression of emotions that emotionally animates its body is inherently self-limiting in nature and leads the observer to emotionally identify itself with its body. In reality, the observer's body is only a form of information that appears in the world it perceives. In reality, the observer is only a presence of consciousness at the central point of view of that holographic world.

The problem of the personal self-identification of the observer with its body, which is the problem of delusion, is compounded due to the self-defensive nature of emotions. The easiest way to understand the self-defensive nature of emotions is with the ideas of

Darwinian evolution, natural selection, and the survival of the fittest body. Darwinian evolution is not just about genetic evolution, but is also about emotional evolution. Not only does the genetic information encoded within the body evolve, but the emotions expressed by the body also evolve. Natural selection in turn then selects those bodies for survival that are best able to survive, which is called the survival of the fittest body. Body survival not only depends on generic evolution, but also on the evolution of emotions. This is an inevitable consequence of living in a body-eat-body world. At the most primitive level of body survival, the body must eat other bodies in order to survive while it also avoids being eaten by other bodies. Body survival is an energetic process that requires the expression of emotions. Body survival is really nothing more than the coherent self-replication of the form of the body in a recognizable way while the body is emotionally animated. The body must coherently hold together as a recognizable form of information over a sequence of observable events in order to appear to survive.

The only way the body can appear to coherently hold together as a recognizable form of information over a sequence of observable events as the body is emotionally animated is if the body adds organizing potential energy to its form. The addition of organizing potential energy to the body is called eating, which is necessary for body survival. This fact has a simple thermodynamic explanation. Work must be performed within the body in order to maintain the coherent organization of the body while the body is emotionally animated, and the energy that allows this work to be performed requires the addition of organizing potential energy to the body. If this organizing potential energy is not added to the body, the random flow of thermal energy through the body will disorganize the body and the form of the body will eventually fall apart and no longer be coherently self-replicated in recognizable way. The thermal disorganization of the body must be counterbalanced by the coherent organization of the body, which requires the addition of organizing potential energy to the form of the body if the body is to survive.

Bodies only survive because they eat other bodies. That's the only place they can find the organizing potential energy they need in order to survive. The addition of organizing potential energy to the body is emotionally expressed as the desire to eat another body. At the same time, if the body is to survive, the body also needs to avoid being eaten by another body, which is emotionally expressed as the fear of being eaten by another body. This unfortunate state of affairs is an inevitable energetic consequence of living in a body-eat-body world, where bodies must eat each other in order to survive. Natural selection has selected those bodies for survival that are best able to eat other bodies while they also avoid being eaten by other bodies. At the most primitive level of body survival, that's what the survival of the fittest body is all about. There is an inherent emotional conflict in the expression of these survival emotions. The expression of the desire to eat another body is a movement toward another body, while the expression of

the fear of being eaten by another body is a movement away from another body. There is no way to resolve this emotional conflict at the level of the motion of bodies.

The emotional expression of fear and desire are always driven by the pleasure-pain principle. Whatever promotes body survival, like eating, feels good and gives pleasure, while whatever threatens body survival, like being eaten, feels bad and gives pain. The survival of the fittest body is always driven by the pleasure-pain principle, as whatever promotes body survival and gives pleasure is pursued while whatever threatens body survival and gives pain is avoided. That pursuit of pleasure and avoidance of pain are ultimately what the emotional expressions of fear and desire are all about.

The human life-form is a social animal, and not only expresses the primitive emotions of fear and desire, but also expresses social emotions, like emotional attachments. The immature body of a child is not able to fend for its own survival, but must emotionally attach itself to the body of its mother or caregiver in order to survive. The expression of the social emotions of emotional attachments are just as necessary for body survival as are the expression of the primitive emotions of fear and desire.

The thing to be crystal clear about is that all the primitive emotional expressions of fear and desire are self-defensive in nature as they defend the survival of the body. Even the expression of social emotions, like emotional attachments, are self-defensive in nature as they defend the survival of the body. The body only appears to survive in the world as the coherently organized form of the body is self-replicated in form in a recognizable way over a sequence of observable events while the body is emotionally animated.

The big question you have to ask yourself is: Who exactly is recognizing the form of the body as its own form as the body is self-replicated in form in a recognizable way over a sequence of observable events while the body is emotionally animated? The answer of course is the observer, but the observer is not its body. The observer is a presence of perceiving consciousness at the central point of view of its own holographic world. The observer's body is only the central form of information that appears in that world. The observer only mistakenly or emotionally identifies itself with the form of its body due to its perception of emotional feelings of self-limitation to the form of its body as its body is emotionally animated relative to all other forms that appear in its own holographic world.

This is the basic problem of delusion. The observer emotionally identifies itself with the form of its body due to its perception of emotional feelings of self-limitation to its body as its body is emotionally animated relative to all other forms. Those emotional expressions are all self-defensive in nature as they defend the survival of the body. Once the observer emotionally identifies itself with its body, it then feels compelled to defend the survival of its body as though its existence depends on it. This creates a vicious cycle that leads to the expression of more self-defensive emotions, which perpetuates the

observer's emotional self-identification with its body. The observer's false assumption that its existence depends on the survival of its body is the primary false belief that underlies the nature of delusion. The observer's delusion is this false belief that the observer believes about itself that its existence depends on the survival of its body. The very act of self-recognition and emotional self-identification with a body is delusional.

If you want to break free of delusion, the first question you have to ask yourself is Who are you really? The only possible answer is that you are a presence of consciousness that is identifying itself with its personal self-concept or ego. To identify yourself with your ego, you have to perceive your ego. In the sense of a subject-object relation, you are the subject and your ego is an object that you're perceiving. You are the subjective perceiver, which is called I. The ego is also called I, but the ego is a false I, since the ego is something that you can perceive. The true subjective nature of the I is the perceiver, which can only be described as a pure presence of perceiving consciousness. The true nature of the perceiver cannot be something it perceives.

The second question you have to ask yourself is Why do you identify yourself with your ego? The answer is weird, but there is no other possible answer. Everything you can perceive is like a computer-generated virtual reality. Images of that virtual reality are projected from a screen to your point of view and are animated in the flow of energy that energizes the computer. The computer screen encodes bits of information, and that information is organized into the form of images that are projected to your point of view. Modern physics tells us those bits of information are encoded as qubits on an event horizon that acts as a holographic screen, and that event horizon always arises in an observer's accelerated frame of reference. The laws of nature are simply the computational rules that govern the operation of the computer. This is a quantum computer that is constructed as you enter into an accelerated frame of reference and qubits of information are encoded on your event horizon that acts as a holographic screen. That's how the computer-generated virtual reality game is created.

You have to understand that you're suffering under a hypnotic trance. You're suffering under a hypnotic spell, and you've cast that spell upon yourself. You believe that you're a person in the world you perceive, but you're not. Your belief that you're a person in the world you perceive is nothing more than a false belief you believe about yourself. It's a big lie, and it's personal. The big lie is your false belief that you're a person in the world you perceive. At the level of perceiving your own world, you're the consciousness that's present at the center of that world. You're nothing more than a presence of consciousness that exists at the central point of view of your own world. That presence of consciousness always carries with itself its own sense of individual existence, which is called *I Am*. That sense of individual existence is the sense of being present as you perceive that world. The only true thing you can ever know about yourself as you perceive your own world is your own sense of being present, the sense *I Am*.

You have to understand how you're casting the hypnotic spell under which you suffer. The key point of this state of affairs is that everything you can perceive arises in a subject-object relation. You are the perceiving subject, which is a moving point of illuminating and perceiving consciousness at the central point of view of your own holographic world. Everything that you can perceive in that world, which are all the observable objects of that world, are forms of information encoded on the screen, which are the animated images of that world that are projected from the screen to your point of view. Those forms can always be reduced to qubits of information encoded on your own holographic screen that arises as an event horizon due to your own accelerated motion. You project those images as you focus your attention on them and illuminate them by shining the light of consciousness on them.

This moving point of illuminating and perceiving consciousness is called the *Self*. The *Self* is the subject in the subject-object relation that defines self and other. The *Self* always carries with itself its own sense of individual existence, which is called *I Am*. This sense of I-Am-ness is the sense of being present as the *Self* perceives its own virtual reality world. The ego is part of that virtual reality world, like the central character or an avatar in a virtual reality game. When the *Self* identifies itself with its ego, it is as though the ego is the perceiver of that virtual reality world, but the true nature of the perceiver is always the *Self*. There is only an illusion that the ego can perceive that virtual reality world when the *Self* identifies itself with its ego.

How does self-identification occur? The virtual reality world is emotionally animated, and that emotional energy arises from the motion of the *Self* as a moving point of illuminating and perceiving consciousness. The subject-object relation of self and other becomes perverted as the *Self* takes itself to be its ego and sees all the objects in its world as separate from its ego. In reality, its ego is just another object the *Self* perceives, but when the *Self* identifies itself with its ego, it seems as though its ego is the perceiver of all those other objects. Self-identification always creates a sense of separation. The ego is always mentally constructed as a personal self-concept, and the self-concept is always emotionally energized and body-based. In the mental construction of the ego, a body-based self-image is emotionally related to the image of some other thing the *Self* perceives. That emotional relation makes the *Self* feel emotionally self-limited to the emotionally animated form of its body as it perceives that emotional energy. When the *Self* feels emotionally self-limited to the emotionally animated form of its body, it falsely identifies itself with its ego. Self-identification with its ego is only a false belief the *Self* believes about itself due to its feeling of self-limitation, which is no more real than an emotional body feeling it perceives in its virtual reality.

Why does that expression of emotional energy make the *Self* feel self-limited to the form of its body? The expression of emotions, as in the expression of fear and desire, are about defending the survival of the body in the virtual reality world. The body only

survives in the virtual reality world because it expresses self-defensive emotions. That's the only purpose of expressing self-defensive emotions. Their expression defends body survival. When the *Self* emotionally identifies itself with its ego and feels emotionally self-limited to the form of its body, it feels compelled to defend the survival of its body and ego in the virtual reality world as though its existence depends upon it. The way the *Self* defends the survival of its ego is by focusing its attention on its ego in a personally biased way, which leads to the expression of more personally biased self-defensive emotions that emotionally reinforce its self-identification with its ego.

Delusion arises because the *Self* is defending the survival of its ego as though its existence depends upon it. That's how the *Self* emotionally constructs all the false beliefs it believes about itself. Those false beliefs are emotionally constructed in its mind as self-concepts. Expressions of fear and desire are self-defensive emotions that have no other purpose than to defend the survival of the body and the ego. When the *Self* feels compelled to defend the survival of its body and ego in the virtual reality world that it perceives as though its existence depends upon it, those are the self-defensive emotions the *Self* will express with its personally biased focus of attention.

Something else weird happens when the *Self* expresses emotions and identifies itself with its personal self-concept. The self-concept requires the mental construction of a body-based self-image. That personal self-image is always constructed out of memory of past events and anticipation of future events. The construction of a personal self-image requires an emotional projection into either the past or the future. A personal self-image can only be constructed out of memory or anticipation of events. The problem is, the *Self* as a presence of consciousness is only present in the present moment. When the *Self* emotionally constructs a personal self-image through emotional projection into past or future events, the *Self* is no longer aware of itself as a presence of consciousness that only exists in the present moment. That lack of awareness of itself is a key aspect of how the *Self* falsely identifies itself with its ego. Memory of the past and anticipation of the future are aspects of the virtual reality world that the *Self* perceives. As the *Self* perceives its personal self-image constructed out of the remembered past or the anticipated future, this leads the *Self* to identify itself with its ego that can only appear to exist over the course of time in that virtual reality world.

When the *Self* emotionally identifies itself with its ego, it feels compelled to defend the survival of its ego as though its existence upon it. All expressions of fear and desire defend the survival of the ego because they defend the survival of the body. The ego really only cares about defending its own survival in the virtual reality world, which is what the *Self* cares about when it identifies itself with its ego. The most important way the ego defends its survival is by expressing the desire to be in control and to feel powerful. The ego defends its survival in relation to other things that appear in the virtual reality world by expressing the desire to control things and have power over

others. The desire to be in control and have power over others is always self-defensive. That's how the ego defends its survival. The desire to defend itself arises from its fear of death and non-existence, and the desire to be in control and feel powerful is a denial of death. At its very core, the ego is only motivated by fear and denial.

The *Self* is a point of impersonal perceiving consciousness at the central point of view of its own holographic world that is only identifying itself with the form of a person that appears in that world. There is no way to understand the *Self* as being a person or having a personal origin. The *Self* is inherently impersonal. The form of a person is only another object that the *Self* perceives in its own holographic world. There is only an illusion that the *Self* is personal when the *Self* identifies itself with the form of a person.

The *Self* is a presence of consciousness that perceives all the perceivable objects of its own holographic world. It is a moving point of illuminating and perceiving consciousness at the central point of view of that world. The *Self* is a point of impersonal perceiving consciousness at the central point of view of its own holographic world that is only identifying itself with the form of a person that appears in the world it perceives. The *Self* identifies itself with the projected and animated image of a person as it projects, animates and perceives that image. The very nature of personal self-identification is delusional. Personal self-identification is a false belief that impersonal consciousness believes about itself. Impersonal consciousness falsely believes that it is a person that appears in the holographic world that it perceives. The nature of delusion is this false belief the *Self* believes about itself that it is a person in the world it perceives.

The question you have to ask yourself is why does the *Self* identify itself with the form of a person that appears in the holographic world it perceives? The answer is that personal self-identification is emotionally driven. The *Self* always carries with itself its own sense of individual existence, which is called *I Am*. This sense of I-Am-ness is the sense of being present in the present moment as the *Self* perceives its own world. The perception of that world always occurs in the present moment. The *Self* is not only a point of perceiving consciousness as it perceives the virtual reality game, but also is a point of moving consciousness that animates the game. The energy of the motion of the *Self* animates the images of the game. In the language of modern theoretical physics, the *Self* is an observer in an accelerated frame of reference. The energy of that accelerated motion is what energizes and animates the projected images of the game. This energy of accelerated motion naturally arises as the *Self* focuses its attention on the projected images of the game, which animates the images of the game. The number one image the *Self* animates as it focuses its attention on the game is its character in the game, which appears to be a person in the world. In reality, the person in the world is no more real than an avatar in a virtual reality game the *Self* plays as it focuses its attention on the game. The energy animating a person in the world is called emotional

energy. The *Self* is investing its own emotional energy in the game as it focuses its attention on its character in the game. That's how its character is emotionally animated.

The emotional animation of its character in the game explains why the *Self* identifies itself with its character. The *Self* feels emotionally self-limited to the form of its character as it perceives the flow of emotional energy that animates its character. The emotionally animated form of its character is really only an image of the game that is projected from the computer screen to its central point of view as the *Self* perceives the image, but when the moving *Self* expresses the emotional energy that animates that image with its own motion, and when the perceiving *Self* feels emotionally self-limited to that image as it perceives the animation, the *Self* emotionally identifies itself with that image. The *Self* is creating the conditions that lead to its emotional self-identification with the form of a person as it expresses the emotional energy that animates that form and then perceives the flow of emotional energy that animates that form, which makes it feel emotionally self-limited to that form. That expression of emotional energy naturally arises from its own motion as it focuses its attention on the animated life of the person in the world it takes itself to be and emotionally identifies itself with that animated form.

Emotional self-identification of the *Self* with the form of a person that appears in the virtual reality game it plays leads to the mental construction of an emotionally animated self-concept. The mental construction of a personal self-concept is like the self-referential narration of the virtual reality game by the central character of the game. The central character is referring to itself as the personal self-concept is mentally constructed. The self-concept can only become mentally constructed as a personal self-image is emotionally related to the image of some other thing the *Self* perceives in the virtual reality game. The personal self-image can only be constructed out of memory, just like the memory that operates inside a computer, since the personal self-image is just another aspect of the computer-generated virtual reality game. The construction of a personal self-image out of memory requires an emotional projection from the present moment to past or future events. The personal self-image can only be constructed out of memory when past events are remembered or when future events are anticipated. The emotional construction of a personal self-image is an emotional projection out of the present moment into the remembered past or anticipated future.

When the *Self* only pays attention to its emotionally constructed self-concept, it is only paying attention to a personal self-image that is an emotional projection to past or future events, and is not paying attention to what actually happens in the present moment. The *Self* is not aware of itself as a presence of consciousness that only exists in the present moment. The *Self* is ignoring its own sense of being present or I-Am-ness when it only focuses its attention on its personal self-image, which is always emotionally constructed in its mind as its self-image is emotionally related to the image of some other thing that appears in the virtual reality game that it is playing. The *Self* is not aware of itself

because the *Self* is only paying attention to its personal self-image that can only be emotionally constructed out of memory through an emotional projection to past or future events. The *Self* loses awareness of itself by only paying attention to its emotionally constructed self-concept, which is no more real than the self-referential narration of the virtual reality game by the central character of the game.

This explanation nicely explains how the *Self* plays the computer-generated virtual reality game. The key point is that the *Self* must be present as it focuses its attention on the game. The *Self* becomes aware of itself when it focuses its attention on its own sense of being present. If the *Self* only focuses its attention on its own personal self-image or self-concept, then the *Self* loses its awareness of its own sense of being present. That's how the *Self* identifies itself with its character in the game. That's how the *Self* identifies itself with its personal self-concept or ego.

This explanation also explains how the *Self* awakens to the truth of what it really is. The *Self* must first become aware of its own sense of being present as a presence of consciousness at the center of its own world that only exists in the present moment. The *Self* has to stop focusing its attention on its personal self-image and stop emotionally projecting itself into a non-existent past or future through the manipulation of memory. That's the only way the *Self* can stop emotionally constructing a personal self-concept in its mind. That's the only way the *Self* can stop emotionally identifying itself with its central character in the virtual reality game it's playing.

To be clear about things, consciousness does not evolve. *Consciousness is*, which is often stated as *I Am*. Consciousness is the ultimate nature of existence, which is the nature of your own being. The ultimate nature of your own existence is *timeless being*, which does not evolve in time. That *timeless being* is the ultimate nature of your being. At the level of perceiving your own holographic world, you can only know your *Self* to be a presence of perceiving consciousness at the central point of view of that world. The only true thing you can ever know about your *Self* is your own sense of being present as you perceive that world. Whatever you perceive in that world constantly changes over time, but your own sense of being present as the perceiver of that world is always the same sense of being and does not change. As the perceiver of your own world, you always exist in an *eternal now*, which is a reflection of your own *timeless being*.

On the other hand, delusion does evolve. Your delusion that you are a person that appears in the holographic world that you perceive evolves in the sense of Darwinian evolution, natural selection and the survival of the fittest body. That evolution is how the expression of your self-defensive emotions evolve that make you feel emotionally self-limited to the form of your body as your body is emotionally animated, which leads you to emotionally identify yourself with the form of your body. When you suffer from

delusion, you come under the sway of the conditioning of Darwinian evolution, which makes you feel that your own existence depends on the survival of your body.

When you come under the sway of Darwinian evolution, you're being conditioned by Darwinian evolution. That conditioning takes the form of self-concerned thoughts. Your self-concerned thoughts are emotionally constructed in your mind as a body-based personal self-image is emotionally related to the image of some other thing that appears in the world you perceive. Those emotional expressions are all self-defensive in nature in the sense that they defend the survival of your own body as though your existence depends on it. This is the inevitable result of emotionally identifying yourself with your body. You've been conditioned to think these self-concerned thoughts about yourself.

Delusion evolves because the self-concerned thoughts you think about yourself evolve. This conditioning has evolved over millions of life-times. In reality, you are a presence of perceiving consciousness at the central point of view of the world you perceive, and your thoughts are only emotionally animated forms of information that appear in that world. Your self-concerned thoughts are like the self-referential narration of a movie by the central character of the movie. Your self-concerned thoughts are personal in nature because you're emotionally identifying yourself with the personal form of the central character of the movie. Your self-concerned thoughts are all about whatever personal troubles the central character finds itself to have in the movie and how the central character can get out of those troubles. Your self-concerned thoughts are delusional because you are not a person. You are not the central character of the movie that you're watching. In reality, you are a presence of perceiving consciousness that is watching the movie from your own point of view as the animated images of the movie are displayed on a movie screen and are projected to your own point of view outside the screen.

The problem of the mentally constructed and emotionally energized body-based personal self-concept or ego is only created when the expression of self-defensive emotions are exaggerated, amplified, distorted and perpetuated in a nearly continuous inner running monologue of self-concerned thoughts emotionally constructed in the mind. Self-concerned thoughts are self-referential in nature, as they refer to survival of the body, and are like the self-referential narration of a movie by the central character of the movie. Whatever personal troubles the central character finds itself to have in the movie, the self-referential narration of the movie by the central character is all about how the central character can get out of that trouble. That's the nature of self-concerned thoughts. Self-concerned thoughts have been conditioned over millions of life-times by Darwinian evolution and natural selection, which is all about defending the survival of the body. The bodies that survive in the sense of the self-replication of their forms and the sexual reproduction of their forms are the bodies that are best able to defend the survival of their forms through the expression of self-defensive emotions. That's what the survival of the fittest body and the expression of fear and desire are all about. Body

survival is really nothing more than the coherent self-replication of the emotionally animated form of the body in a recognizable way over a sequence of observable events.

The ego has evolved over millions of life-times because the ego is a way of ensuring the survival of the body. The self-referential construction of the ego in the mind is always emotionally energized, as a body-based self-concept or self-image is emotionally related to the concept or image of some other thing. The other thing is in emotional relationship with the body. Since the purpose of the ego is to defend the survival of the body, these emotional expressions are self-defensive in nature. Unlike a self-defensive emotion that naturally occurs in the moment, these self-concerned thoughts are nearly continuous in nature, and create an inner running monologue in the back of your mind. They're often referred to as automatic thoughts that you may only be vaguely aware of. They are not unconscious, but you may only have a dim conscious awareness of them.

A key aspect of delusion is personal bias. As you express self-defensive emotions and emotionally identify yourself with your personal form, you're being conditioned by Darwinian evolution to express self-defensive emotions that defend the survival of your body as though your existence depends on it. That false belief that you believe about yourself that your existence depends on the survival of your body is the nature of your personal bias. That personal bias is expressed with the expression of personally biased emotions that defend the survival of your body as though your existence depends on it.

The expression of that personal bias arises from personal bias in the focus of your attention. As you focus your attention on the life your character appears to live in the world you perceive in a personally biased way, you express personally biased emotions that animate the life of your character. You've been conditioned by Darwinian evolution to express your emotions in that personally biased way because you're defending the survival of your body as though your existence depends on it. That false belief you believe about yourself, which is inherent in every self-concerned thought you think about yourself, is the nature of your personal bias in the focus of your attention.

Personal bias is only possible because you always have a choice about what you can perceive in your own world. You make that choice as you focus your attention on things in your own world. Whatever you focus your attention on is what you perceive. That choice is inherent in the quantum state of that world. At the level of ordinary quantum theory, the quantum state of your own world can be understood as a sum over all possible paths that connect two points in that world, and you always have a choice about which path you will follow. The quantum state is a state of potentiality that only specifies the quantum probability about how likely it is that you will follow any particular path. The classical path, which is called the path of least action, is only the most likely path in the sense of quantum probability, but even the classical path assumes that

choices are made in an unbiased way. If personal bias arises in the way the choices are made, then all bets are off and the quantum state loses its classical predictability.

The sum over all possible paths of the quantum state is a superposition of observable states that represents quantum entanglement. At the level of the holographic principle, quantum entanglement represents that all the qubits of information encoded on your own holographic screen are entangled. Again, this entanglement of the qubits is a state of potentiality that specifies how likely it is that you will observe anything in your own holographic world, but that likelihood assumes that you're making your choices without any bias. If you observe things with personal bias, then you're making your choices in a personally biased way. You make your choice about what you will observe in that world as you focus your attention on things that appear in your own holographic world.

Your focus of attention is directly related to the light of consciousness that illuminates your own holographic world and that projects the images of that world from your own holographic screen to your own point of view, like the light of a movie projector. The illuminating effect of the light of consciousness is directed with your focus of attention on things in your own holographic world. This illuminating and projecting effect of the light of consciousness, which is directed with your focus of attention on things, is the solution to a famous problem of perception, which is called the qualia problem.

Both quantum theory and the holographic principle tell us that at the level of the quantum state information is encoded in terms of quantities. A qubit of information is a quantity. The problem is that we do not perceive the world in terms of quantities, but rather in terms of qualities. We do not perceive quantities, like the wavelength of light, but rather qualities, like the color of light. At the level of the quantum state, which is an unobserved state of potentiality, the qubits are all entangled, but when we perceive the form of something in the world, we are disentangling the quantum state and perceiving an actual observable state. The observation of the form of something is only possible because we are disentangling the quantum state as we make our observations of the world, which is always a choice, like the choice about which path to follow.

When we make our choices about what to observe in the world or which path to follow through the world, and thereby disentangle the quantum state, we are directing the light of consciousness through the focus of our attention. In terms of the holographic principle, information is encoded on a holographic screen in terms of entangled qubits, but when we make our choices and disentangle the quantum state, we're directing the light of consciousness through the focus of our attention. The illuminating effect of the light of consciousness is how images of our own holographic world are projected from our own holographic screen to our own point of view. In the process, we do not perceive quantities, like the qubits encoded on the holographic screen, but rather qualities, which

characterize the form of things. The qualities of things are inherent in the images of things that are projected through the illuminating effect of the light of consciousness.

This solution to the qualia problem goes a long way toward explaining the nature of personal self-identification. The problem is personal bias in the observer's focus of attention. The observer's perception of feelings of personal self-limitation to the form of its body is an emotional quality. Just as feelings of pleasure and pain are emotional qualities, the feeling of personal self-limitation to a body is also an emotional quality. That emotional quality arises with personal bias in the observer's focus of attention. The observer's focus of attention is personally biased because the observer is emotionally identifying itself with the emotionally animated form of its body due to its perception of emotional feelings of self-limitation to its body that arise as self-defensive emotions are expressed. That personal bias arises from the false belief the observer believes about itself that its existence depends on the survival of its body, which leads to the expression of more self-defensive emotions, perpetuates the vicious cycle of personal self-identification, and reinforces the observer's false belief that it believes about itself that it is a person that appears in the world it perceives. That false belief is created as personally biased self-concerned thoughts are emotionally constructed in the observer's mind. Personal self-identification is only possible because of personal bias in the observer's focus of attention that leads to the expression of personally biased emotions.

The problem of delusion is created due to personal bias in the observer's focus of attention. Once the observer emotionally identifies itself with the personal form of its body, it then feels compelled to defend the survival of that personal form as though its existence depends on it. The expression of those self-defensive emotions arises from personal bias in the observer's focus of attention. The observer's perception of feelings of personal self-limitation to the form of its body arises from that personal bias as personally biased emotions are expressed, which typically are self-defensive as they defend the survival of the body. Just as feelings of pleasure and pain are emotional qualities, the feeling of personal self-limitation to a body is also an emotional quality.

The personal bias of personal self-identification is the nature of delusion. Delusion evolves in the sense of Darwinian evolution, natural selection and survival of the fittest body because that's how the observer's mind has been conditioned over millions of life-times to think personally biased self-concerned thoughts about itself. The inherent emotional nature of those self-concerned thoughts is self-defensive in the sense of defending the survival of its body as though the observer's existence depends on it. That false belief the observer believes about itself is the big lie at the heart of delusion.

The true nature of the observer is not its body, but consciousness. Consciousness does not evolve. *Consciousness is*. Consciousness is the nature of being, which ultimately is

timeless being. Delusion can evolve over millions of life-times, but not consciousness. Consciousness can only be what it really is, which is the ultimate nature of existence.

Consciousness can only realize the true nature of what it really is when delusion comes to an end. Just as delusion can evolve over time, delusion can also come to an end. Delusion can evolve over millions of life-times, but eventually must come to an end. The end of delusion is called spiritual awakening. When consciousness awakens to the true nature of what it really is, delusion comes to an end.

Spiritual awakening requires insight. You have to turn the focus of your attention away from the world you perceive and look within. The first thing you have to focus attention on as you look within is your own thoughts, memories and emotional states, especially as they give rise to the mental construction of your personal self-concept. You have to make a thorough examination of your thoughts, memories and emotional states that underlie the mental construction of your personal self-concept. The thing you have to be clear about is that your thoughts, memories, emotional states and mentally constructed personal self-concept are not you. These are things that you can perceive, but you are not something that you can perceive. You can only know yourself to be the presence of consciousness that perceives these things. The only true thing you can ever know about yourself is your own sense of being present while you perceive these things. The first step in spiritual awakening is the rejection of everything you can think about yourself in the sense of a personal self-concept. You can only know yourself to be the *Self*, which is the *I Am* presence of consciousness at the center of everything that you can perceive.

Spiritual awakening also requires you to do nothing, first at a personal level, and then ultimately at an absolute level. You do nothing at a personal level when you surrender to divine will and give up the expression of your personally biased individual will and your desire to do things. You have to stop trying to control things and defend yourself. You have to see that you're only defending the survival of a personal illusion of what you really are, and that the true nature of your existence needs no defense since its true nature can never stop existing and is never threatened with nonexistence. You have to lose that personal bias in the focus of your attention and stop expressing personally biased emotions. You do nothing at a personal level when you stop expressing that personally biased emotional energy. In addition to your surrender, you also have to sever your emotional attachment to everything you can perceive in the world. When you sever an emotional attachment to something, that expression of emotional energy also comes to an end. Ultimately, you have to sever the emotional attachment to your own personal character that appears in the world you perceive. You have to see that the life your character appears to live in that world you perceive is only an illusion of what you really are, like a character that appears in a virtual reality movie that you're watching, and lose interest in paying attention to that illusion. You sever the emotional attachment to your character when you stop caring about that life and lose interest in living that life.

When you see that life as an illusion, you naturally withdraw your attention away from that life and stop paying attention to that life, which is how you withdraw your investment of emotional energy in that life. When you stop paying attention to that life, you also stop emotionally animating that life. When you sever your emotional attachment to your character, your character becomes dead to you. You lose interest in living that life. Your emotional detachment from your character is a necessary step in the process of doing nothing at an absolute level as the expression of all emotional energy comes to an end.

When you withdraw your attention away from the world you perceive and away from the life your character appears to live in that world, thereby withdrawing your investment of emotional energy in that life that animates that life, you become able to look within and refocus your attention on your own sense of being present as the *Self*, which is the *I Am* presence of consciousness at the center of the world you perceive. You turn away from the world and refocus your attention on the center of *Self*. Ultimately, you have to look beyond the center of *Self*, into the emptiness of your own being. When you look beyond the center of your *Self* into the emptiness of your own being, while doing nothing at an absolute level, you fall into that emptiness, that emptiness explodes, and your individual being, the *I Am*, dissolves back into its source of undivided being like a drop of water that dissolves back into the ocean. That undivided and unlimited timeless being is only describable in terms of negation as the absolute nothingness of the void. That nondual emptiness of being can only be described in terms of negation as deep and dark, and as silence and stillness. In that emptiness of being, there is no duality of self and other. There is no *I Am* and there is no *Self*. There is only undivided nondual being.

Only the subject-object relation of perception gives rise to a state of duality, which is the observer's experience of self and other. The true nature of the *Self* is the observer, which is a point of illuminating and perceiving consciousness at the center of its own holographic world. The only true thing the observer can know about its *Self* is *I Am*, which is its own sense of being present as it perceives events in its own holographic world, but this state of duality is characterized by delusion due to the observer's emotional self-identification with the form of its body that appears in its holographic world. The observer's body is only the central form of information that appears in its own holographic world, but when that personal form is emotionally animated relative to all other forms that appears in its world, the observer feels emotionally self-limited to that personal form due to its perception of feelings of emotional self-limitation to its body, which leads the observer of emotionally identify itself with the personal form of its body and gives rise to its dualistic experience of self and other in its own holographic world.

Every observer creates its own holographic virtual reality world, but what appears in that virtual reality world is no more real than the projected and animated images of a movie being displayed on a computer screen. Even the information and energy inherent in that virtual reality world can only arise due to the accelerated motion of the observer. The

observer's virtual reality world can only appear to come into existence due to its own accelerated motion. In the end, when that accelerated motion comes to an end, that virtual reality world disappears from existence from the observer's own point of view and only the consciousness of the observer ultimately exists. When everything in your own world disappears from existence from your own point of view, what remains? The answer is nothing. That absolute nothingness is what you ultimately are.

The true nature of what you are is what remains when everything else disappears from existence. That absolute nothingness is the ultimate nature of existence, which is best described as pure undivided and unlimited timeless being. That pure *timeless being* is the source of your own consciousness that arises at the central point of view of your own holographic world. Your holographic world always appears to come into existence and disappears from existence from your own point of view. The source of your own consciousness is not the physical world that you perceive, but that pure *timeless being*. The direct experience of that *timeless being* is called spiritual enlightenment. Spiritual enlightenment is possible because you can withdraw the focus of your attention away from the world you perceive. When you focus your attention on events in that world, that world appears to come into existence, and when you withdraw your attention away from that world, that world disappears from existence from your own point of view.

Delusion can only come to an end when the observer's emotional self-identification with the personal form of its body comes to an end. The observer's holographic world only appears to come into existence when the observer focuses its attention on the events of its holographic world. When the observer withdraws its attention away from the events of its holographic world, its holographic world disappears from existence from its own point of view. When the observer withdraws its attention away from the events of its holographic world, it also withdraws its investment of emotional energy in that world that emotionally animates the form of its body within that world relative to all other forms that appear in that world. When the observer withdraws its attention away from the events of its holographic world, it also withdraws the focus of the light of consciousness away from events in that world that illuminates that world and projects all the images of that world from its own holographic screen to its own point of view at the center of that world. When the observer's own holographic world is no longer illuminated or animated, its holographic world disappears from existence from its own point of view.

The disappearance of the observer's own holographic world from its own point of view is always experienced as an ultimate state of free-fall. When the observer withdraws its attention and investment of animating emotional energy away from its holographic world and that world is no longer animated, the observer's own accelerated motion relative to the motionless void also comes to an end. Without the observer's animation of its world, the course of time comes to an end. The end of that accelerated motion is an ultimate state of free-fall in which the observer no longer has an event horizon that acts as its

holographic screen and no longer perceives events in its own holographic world. In this ultimate state of free-fall, everything in the observer's own holographic world disappears from existence from its own point of view and nothing remains.

What happens to the observer in this ultimate state of free-fall? The answer is called spiritual enlightenment. The observer's individual being, the *I Am*, which is always present as a point of illuminating and perceiving consciousness at the center of its own holographic world, dissolves back into the *One Source* of consciousness like a drop of water that dissolves into the ocean. The individual being of the observer dissolves back into the pure undivided and unlimited timeless being of the void. Not only does the observer's holographic world disappear from existence from its own point of view, but the course of time also comes to an end. The observer's individual being always exists in the *eternal now* of its holographic world, which is a reflection of its *timeless being*. That *timeless being* is experienced with the dissolution of spiritual enlightenment as individual consciousness dissolves back into its source of undivided consciousness.

That unlimited and undivided *timeless being* can only be described in terms of negation as absolute nothingness or void. It is described as motionless since it is the source of all animating energy. It is described as darkness since it is the source of the illuminating effect of the light of consciousness. It is not perceivable, but is the source of perception. It is the source of the individual being of the perceiver of its own world, the *I Am*, which is the illuminating and perceiving consciousness at the center of its own world. It is the source of the perceiver's own motion relative to the motionless void. It is the source of all individual consciousness. It is the source of the *Self*. Within the *One Being* of that absolute nothingness, there is no experience of self and other, hence it is called *No-self*.

After the dissolution of spiritual enlightenment, the observer again experiences its own holographic world, but that world is now experienced from the highest perspective of the emptiness, silence, stillness and darkness of the void. From that highest perspective of consciousness, it is seen how the observer's world appears to come into existence due to the observer's own motion relative to the motionless void that animates all the forms of that world, and how that world is illuminated due to the light of consciousness that projects all the images of the forms of that world from the observer's own screen to its own point of view at the center of that world. The forms are animated due to the observer's own motion, like the animated images of a movie displayed on a movie screen, and are projected from the screen to the observer's own point of view, where the images are perceived, due to the illuminating effect of the light of consciousness that emanates from the observer's own point of view, like the light of a movie projector. All of this is seen from the emptiness, silence, stillness and darkness of the void.

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