

Living in a Holographic World Redux

Abstract

The nature of a holographic world is described in terms of the holographic principle of quantum gravity. This description requires a radical transformation of our understanding of quantum theory. Instead of unitary time evolution as the defining principle of quantum theory, this reformulation of quantum theory is inherently observer-centric and observer-dependent. The only valid definition of time is the observer's own proper-time as the observer follows an accelerating world-line through its dynamically curved space-time geometry, which is a holographic aspect of the observer's own holographic world. The observer's holographic world only appears to come into existence when the observer's event horizon, which arises in the observer's accelerated frame of reference, encodes qubits of information and acts as the observer's holographic screen. Instead of unitary time evolution as the defining principle of quantum theory, the only foundational principles of this reformulation of quantum theory are the nature of entropic information and the observer's own accelerated motion that gives rise to its event horizon. The observer itself can only be understood as the perceiving consciousness present at the central point of view of its own holographic world. This reformulation of quantum theory tells us that the observer must come first. First the observer comes into existence and then its holographic world appears to come into existence as the observer enters into an accelerated frame of reference. This reformulation of quantum theory tells us that there must be a source of the information, energy and consciousness that characterizes the observer and its holographic world. That source can only be described in terms of negation as absolute nothingness or a void of undifferentiated consciousness.

Keywords: Holographic world, principle of equivalence, unitary time evolution, quantum gravity, entropic information, event horizon, observer, consciousness

Introduction and Motivation

Feynman famously stated that "No one really understands quantum theory". Feynman also remarked that "The measurement problem of quantum theory is so confusing that we don't even know if there is a real problem". The pragmatic motto of most theoretical physicists is "Don't ask what it all means, just shut up and calculate". Of course, this pragmatic strategy runs counter to Einstein's philosophy "I'm not interested in the details. I want to know the mind of God". This article attempts to give a much deeper understanding of the nature of quantum theory, not just at the level of the mind of God, which is the nature of one's own mind, but at the level of God itself, which is the nature of one's own Self. To know one's own Self is to know the mind of God.

The basic argument of this article is that the very foundations of quantum theory are flawed. All of quantum theory, including quantum field theory, is built on the foundation of unitary time evolution. There's a straight path from the assumption of unitary time evolution to the path integral formulation of quantum theory to Feynman diagrams. The problem is the whole thing is

based upon the invalid assumption of a universal definition of time that all observers will agree upon, which is only a valid assumption in Minkowski space, where observers can only move relative to each other with uniform motion and there is a notion of time translation invariance. In a dynamically curved space-time geometry with gravity, this assumption is no longer valid. The only possible valid definition of time as an observer follows an accelerated world-line through a curved space-time geometry with gravity is the observer's own proper-time, which is the only invariant quantity of relativity theory. The principle of equivalence tells us the effect of gravity is equivalent to the observer's own acceleration, but this premise is not consistent with the premise of unitary time evolution, where all observers must agree upon a universally valid definition of time. If the very nature of time is not a fundamental thing, then the whole structure of quantum field theory as built upon the premise of unitary time evolution cannot be a fundamental thing. The assumption of Minkowski space may be a useful approximation for experiments in the physics lab, but that assumption cannot be fundamental.

Ultimately, the nature of space is not Minkowski space. We live in a universe with gravity, which implies a dynamically curved space-time geometry. An argument can be made that without gravity, there would be no world with a space-time geometry. The holographic principle tells us that no gravity means no world, since all the information for a holographic world must be encoded on an accelerating observer's event horizon. That requires the observer's accelerated motion, and acceleration is equivalent to gravity. If the observer enters into an ultimate state of free fall, the observer experiences no acceleration and no effect of gravity, and the observer no longer perceives a world because the observer no longer has an event horizon that encodes all the information for that holographic world. In this scenario, the electromagnetic and nuclear forces are just other forms of gravity that can be understood with 11-dimensional super-gravity.

Problem: The Foundations of Physics are Logically Incompatible

The problem with physics is that the foundations of physics, as we currently understand them, are logically incompatible. The big question we have to answer is how do we fix this fundamental problem? We can only make scientific progress if we answer this question. Along the way, we'll gain an understanding of what we mean by spirituality, including the concept of God, which paradoxically, cannot really be conceptualized.

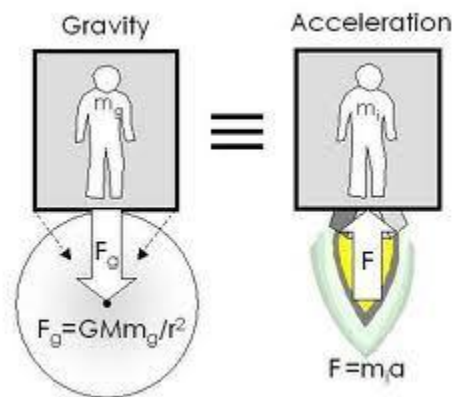
The first foundation of physics is the principle of equivalence, which tells us that all the perceived effects of gravity are equivalent to the accelerated motion of an observer. The second foundation of physics is the idea of unitary time evolution, which is the first principle of quantum theory, both at the level of ordinary quantum mechanics, as in the Schrodinger equation, and at the level of quantum field theory, as in quantum electrodynamics. The premise of unitary time evolution says that the total energy of any system, as represented by the Hamiltonian operator operating on the wavefunction for that system, is proportional to the time derivative of the wavefunction.

$$i\hbar \frac{\partial}{\partial t} |\Psi(t)\rangle = \hat{H} |\Psi(t)\rangle$$

The Hamiltonian operator tells us how to calculate energy eigenstates of that system in terms of an eigenvalue equation involving the wavefunction, and unitary time evolution tells us how a linear superposition of those energy eigenstates will evolve in time.

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

A problem arises when we consider the system of interest to be the entire observable universe. The observable universe is characterized by the force of gravity, which we understand as the dynamical curvature of the space-time geometry of the universe. The principle of equivalence tells us that the observed force of gravity, as observed by any observer, is equivalent to the accelerated motion of that observer.



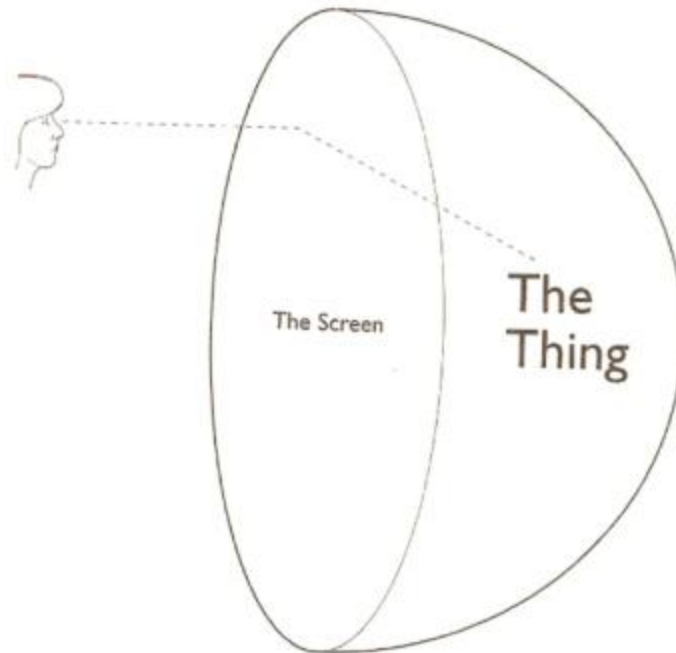
Principle of Equivalence

The problem is that in a dynamically curved space-time geometry with gravity, all observers will not agree upon the same definition of time. There is no notion of time translation invariance that gives a universally valid definition of time in the sense of a time derivative that all observers will agree upon when different observers undergo different accelerated motions. In general, the only

valid definition of time in a dynamically curved space-time geometry with gravity is the observer's own sense of proper-time in its own rest frame, which is the only invariant of relativity theory. One accelerating observer's proper-time is not the same as another accelerating observer's proper-time, as demonstrated by the effect of time dilation. If different observers can't agree upon a universally valid definition of time, then the whole concept of unitary time evolution is called into question as a fundamental defining principle of quantum theory.

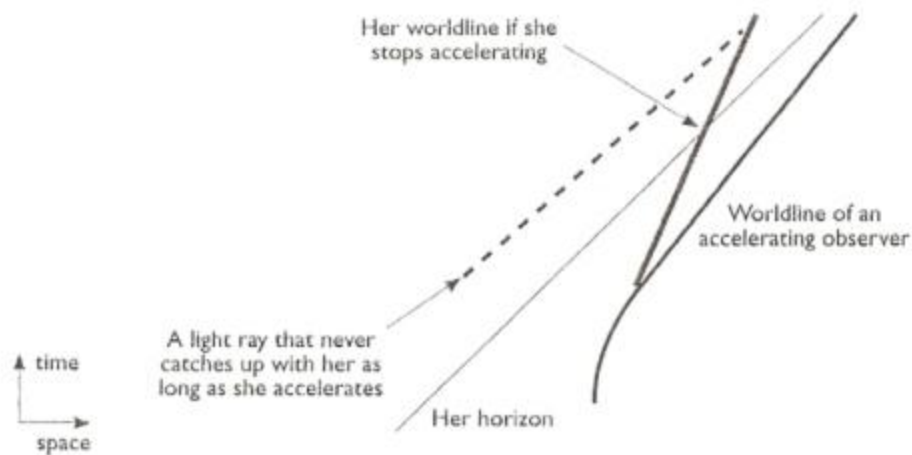
Only in gravity-free, flat Minkowski space, in which different observers can only move relative to each other with uniform motion, is there a valid way to define time translation invariance so all observers will agree upon a universally valid definition of time. All quantum field theories are built upon the premise of unitary time evolution and rely upon this idea of time translation invariance, which is only valid in Minkowski space. Quantum field theories can only be constructed in Minkowski space where there's a notion of time translation invariance and unitary time evolution. In the general case of a dynamically curved space-time geometry with gravity, the idea of time translation invariance breaks down, which means that unitary time evolution breaks down, and it is not possible to formulate quantum field theories in a consistent way. The problem is all observers will not agree upon the same definition of time. From the point of view of any particular observer, only the observer's own proper-time is a valid definition of time.

How do we rectify this fundamental problem? The first thing we have to recognize is that there is a subtle assumption underlying this problem. We're assuming that all observers observe the same universe. What if every observer observes its own universe from the central point of view of that universe? This sounds absurd, but this is exactly what the holographic principle of quantum gravity tells us. What exactly is the observer? The observer is nothing more than a point of view that arises at the center of its own holographic world. The observer is observing events in that holographic world. Those observable events are being displayed on the observer's own holographic screen that encodes information for all those events. The perception of an event is like an image projected from the screen to the observer's own point of view. In the sense of an object of perception, all perceivable objects are forms of information encoded on the screen. If that screen is like a computer screen that encodes bits of information, all perceivable objects are reducible to bits of information, which John Wheeler called "It from bit".



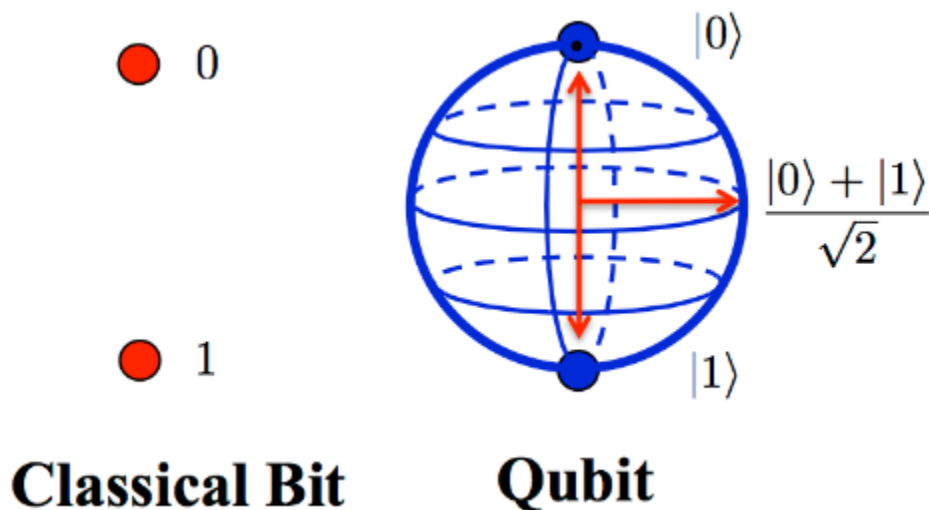
The Observer, the Observer's Holographic Screen, and its Object of Perception

What exactly does relativity theory tell us about the observer? Relativity theory doesn't attempt to explain what the observer is, only that the observer is at the central point of view of its own coordinate system, which is a frame of reference. If that frame of reference is characterized by accelerated motion, which is called an accelerated frame of reference, the observer observes effects of gravity occurring in a dynamically curved space-time geometry. One of those effects of gravity is the observer's event horizon, which limits the observer's observations of events in space. The observer's event horizon is a two dimensional bounding surface of space that limits its observations of events in three dimensional space. We really don't need the whole formalism of relativity theory to understand the nature of an event horizon. We only need the concepts of an observer that undergoes accelerated motion and the invariance of the speed of light, which is the maximal rate of information transfer in three dimensional space. A light ray that originates on the other side of the observer's event horizon can never reach the observer's point of view as long as the observer continues to undergo accelerated motion along its world-line, and so nothing is observable beyond its event horizon.



Accelerating Observer's Event Horizon

Once we have an observer in an accelerated frame of reference and the observer's event horizon, which naturally arises as a bounding surface of space due to the observer's own accelerated motion, we can then construct the holographic principle. The basic idea is that the observer's event horizon acts as its holographic screen that displays images of everything the observer can perceive in its own holographic world. How are those images constructed? The images are all forms of information that can be reduced to bits of information encoded on the observer's event horizon. These bits of information are not classical bits in the sense of a classical computer, but are quantized bits of information in the sense of a quantum computer, which are called qubits.

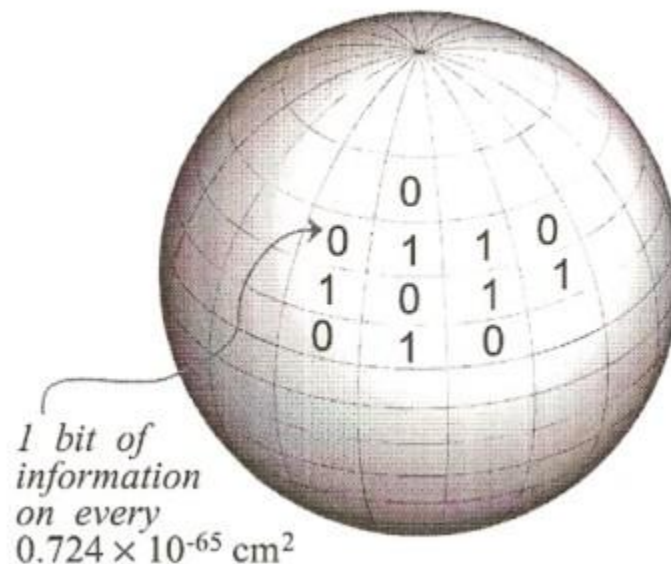


Qubit of Information Encoded on a Planck-size Event Horizon

A qubit is mathematically represented by a two dimensional array of numbers called a matrix, like a Pauli spin matrix, which is an $SU(2)$ matrix. The eigenvalues of the matrix give a

mathematical representation of information encoded in a binary code, like a spin variable that is only observable in either a spin up or spin down state, but this information is encoded on the surface of a 2-sphere in a rotationally invariant way since the $SU(2)$ matrix gives a mathematical representation of rotational symmetry on the surface of the sphere. At the level of qubits, what we call quantum entanglement is a mathematical representation of this rotational invariance.

Since qubits of information are encoded in terms of matrices, which are two dimensional arrays of numbers, this information must be encoded on a two dimensional surface of space. Where does that two dimensional surface of space come from? The answer is the two dimensional surface of space is the observer's event horizon that arises due to its own accelerated motion, limits its observations of events in space, and acts as its holographic screen when that horizon encodes qubits of information. Everything the observer can observe in its own holographic world is a form of information encoded on its own event horizon that acts as its holographic screen. The holographic principle is simply a statement that everything the observer can observe in its own holographic world can be reduced to qubits of information encoded on its own event horizon that arises due to its own accelerated motion and acts as its holographic screen.

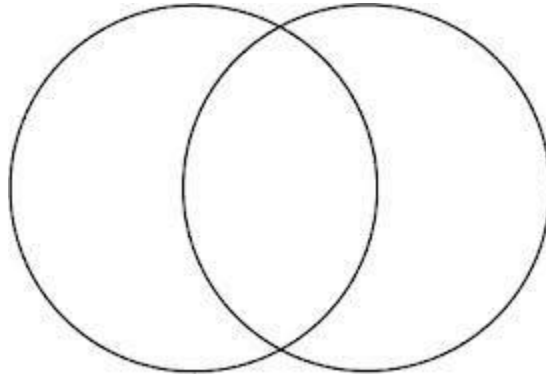


Holographic Principle

The holographic principle tells us that a Planck-size event horizon is the smallest event horizon that can be created since it encodes a single qubit of information, which is the smallest amount of information that can be measured. This explains why the Planck length is the smallest distance scale that can be measured. Larger event horizons encode more qubits of information, but always in terms of an integral number of Planck areas. It is as though each Planck area on the event horizon encodes a single qubit of information, like pixels on a computer screen. The basic idea of the holographic principle is the number of qubits of information encoded on the two dimensional

surface of an observer's event horizon, which arises in its accelerated frame of reference, is given in terms of the surface area, A , of the event horizon and the Planck area, $\ell^2 = \hbar G/c^3$, as $n = A/4\ell^2$.

How do we explain a consensual reality shared by many observers, each present at the central point of view of their own holographic world? The answer is information sharing. When holographic screens overlap like Venn diagrams, they can share information.



Information Sharing Among Overlapping Holographic Screens

The holographic principle is telling us the observer is nothing more than a focal point of perceiving consciousness that arises at the central point of view of its own holographic world. That holographic world only appears to come into existence when the observer enters into an accelerated frame of reference and its event horizon arises that acts as 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 encoded on its own holographic screen. This includes the space-time geometry of the observer's own holographic world. The space-time geometry the observer perceives can also be reduced to qubits of information encoded on its screen.

Reformulating the Laws of Physics in a Holographic World

The holographic principle demonstrates that the laws of physics in a 3+1 dimensional space-time geometry can be reduced to qubits of information encoded on an observer's holographic screen that arises as an event horizon in its accelerated frame of reference. This is exactly what Ted Jacobson demonstrated when he derived Einstein's field equations for the space-time metric from the laws of thermodynamics. Jacobson only had to assume the laws of thermodynamics, that entropy is given in terms of a holographic entropy that only depends on the surface area of the observer's event horizon, $S = kn = kA/4\ell^2$, and the thermal energy inherent in the temperature of the observer's event horizon at thermal equilibrium is given in terms of the observer's acceleration, $kT = \hbar a/2\pi c$. The holographic nature of entropy is understood in terms of qubits of information encoded on the surface of the observer's event horizon, which is called a matrix model.

The laws of thermodynamics tell us that $\Delta E = T\Delta S$, where holographic entropy is given in terms of the surface area of the observer's event horizon as $S = kn = kA/4\ell^2$, and the temperature of the

observer's event horizon at thermal equilibrium is given in terms of the observer's acceleration as $kT = \hbar a / 2\pi c$, which is the Unruh temperature. A change in energy implies a change in entropy, which implies a change in the surface area of the observer's event horizon, which implies a change in the space-time geometry of the observer's holographic world. That's how Ted Jacobson derived Einstein's field equations from the laws of thermodynamics. Einstein's field equations are not really fundamental, but are more like an effective field theory that describes gravitational events in the observer's holographic world when things are near thermal equilibrium.

This way of deriving Einstein's field equations from the laws of thermodynamics tells us that Einstein's field equations for gravity only have the validity of thermodynamic equations of state. Once we have Einstein's field equations, then all the usual quantum field theories of the standard model of particle physics, which include the electromagnetic and nuclear forces, can be derived using the usual unification mechanisms of super-symmetry and extra compactified dimensions of space. This tells us that all the usual quantum field theories of the standard model of particle physics are only valid as thermodynamic equations of state or as effective field theories.

Field theories are not incorrect, but they only have the approximate validity of thermodynamic equations of state. Einstein's field equations for gravity, Maxwell's field equations for electromagnetism and Dirac's field equations for the electron can all be understood as quantum theory at the level of first quantization. Second quantization of field theories built on the idea of unitary time evolution is only valid for small quantum fluctuations around thermal equilibrium, but it makes no sense to quantize gravity in flat, gravity-free Minkowski space when Einstein's field equations for gravity must represent the dynamical curvature of space-time geometry.

The holographic principle is a way to reformulate quantum theory without the assumption of unitary time evolution, which is generally not a valid assumption in a dynamically curved space-time geometry with gravity. Instead of assuming unitary time evolution, a foundational principle of quantum theory is the nature of entropic information, which is a qubit of information. A matrix model is the most fundamental way to reformulate quantum theory since a qubit of information is represented by an $SU(2)$ matrix, which is a two dimensional array of numbers that must be encoded on a two dimensional surface of space. That two dimensional surface of space arises as an event horizon in an observer's accelerated frame of reference and acts as the observer's holographic screen when the horizon encodes qubits of information.

The holographic principle is not a theory of everything or even a theory of quantum gravity. The holographic principle as implemented by a matrix model is a mechanism that constructs a holographic world. That holographic world is naturally constructed as an observer enters into an accelerated frame of reference, its event horizon arises in space, and as qubits of information are encoded on the two dimensional surface of its event horizon. This construction process only requires the notion of the accelerated motion of an observer, the invariance of the speed of light as the maximal rate of information transfer in three dimensional space, and the idea of entropic information. A matrix model is the most general way to construct a holographic world and does

not require the assumption of unitary time evolution. In general, the only valid definition of time in a dynamically curved space-time geometry with gravity is the observer's own proper-time.

The AdS/CFT correspondence is a special case that only applies to anti de Sitter space where the boundary of anti de Sitter space is a conformal Minkowski space within which a conformal field theory can be constructed that does obey unitary time evolution. In the more general case, specifically in de Sitter space, this is not a valid assumption. A matrix model can be implemented in the general case even when unitary time evolution is not a valid assumption, and a holographic world can be constructed. The laws of physics only have approximate validity in that constructed holographic world at the level of thermodynamic equations of state. Quantum field theory as formulated with unitary time evolution only has approximate validity within that constructed holographic world for small quantum fluctuations around thermal equilibrium. As condensed matter physicists have known for a long time, QFT is only valid as an effective field theory.

It's worth a brief review of how we got here. The idea of first quantization is based on the idea of a point particle that moves along some path through a space-time geometry. In quantum field theory, that space-time geometry is taken to be flat, gravity-free Minkowski space. The idea of first quantization is to sum over all possible paths that the point particle can follow through that space-time geometry and to weight each path with a probability factor, $P = \exp(iA/\hbar)$, where the particle action is given in terms of the particle's kinetic and potential energy as $A = \int dt(KE - PE)$, and where the integral is along the particle's path. The time variable in the integrand is the same time variable assumed for unitary time evolution, where the particle's wave-function is assumed to evolve in time in terms of the Hamiltonian operator as $\psi(t) = \exp(-iHt/\hbar)\psi(0)$. The Hamiltonian operator is broken up into kinetic and potential energy parts as $H = KE + PE$. The sum over all possible paths or path integral formulation for quantum theory directly follows from unitary time evolution of the wave-function, and is a way to construct the wave-function. The wave-function is a field that obeys a field equation, which is how quantum theory is understood at the level of first quantization. The path integral constructs a wave-function that is a field that obeys a wave or field equation. The second quantization procedure is to sum over all possible configurations of the field and to weight each possible field configuration with the same kind of probability factor, $P = \exp(iA/\hbar)$, but now the field action is written in terms of the field. Just as a particle action gives rise to classical equations of motion when minimized, a field action also gives rise to classical field equations when minimized, but those field equations are really wave equations that give a representation of quantum theory at the level of first quantization. The whole idea of quantum field theory is based on the idea of the second quantization of fields that arise from a first quantization procedure. The problem is we have to begin with the assumptions of unitary time evolution and that a particle moves along some path through gravity-free Minkowski space, which is the only space-time geometry in which the assumption of unitary time evolution is valid. Only in Minkowski space is there a notion of time translation invariance that allows a time variable to be defined that all observers agree upon. The holographic principle totally reverses this process of quantization in that all field theories arise as thermodynamic equations of state.

Even in Minkowski space, it's not clear that all observers will agree upon the same definition of time since each observer has its own proper-time that can differ from the proper-time of another observer due to the effect of time dilation. What makes Minkowski space a special case is that different observers can only move relative to each other with constant velocity motion. The Lorentz group demonstrates that Minkowski space is characterized by time translation invariance which underlies the conservation of energy. Only time translation invariance allows different observers to agree upon the same definition of time in gravity-free Minkowski space.

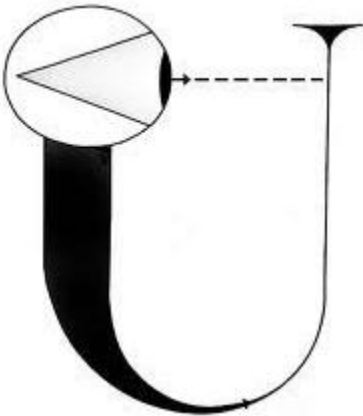
This is generally not the case for a dynamically curved space-time geometry with gravity, in which there is no notion of time translation invariance, which is to say there is no notion of the conservation of energy. How can that be the case? The principle of equivalence tells us that the perceived effect of gravity is equivalent to the observer's own accelerated motion, and if different observers accelerate in different ways, they observe different effects of gravity. When different observers observe different gravitational forces, the notion of time translation invariance and the conservation of energy breaks down. An accelerating observer is creating its own gravitational energy due to its own accelerated motion, which can be different from the accelerated motion of a different observer. When different observers accelerate in different ways, in effect they create their own dynamically curved space-time geometries with gravity that differ from each other, and in general there is no notion of time translation invariance or the conservation of energy in these differing space-time geometries since the perceived gravitational forces are different.

At this point, there may be the objection that the energy of the observer's accelerated motion has to come from some source of energy, and if we add all these energies together, we restore the conservation of energy. The problem is that this is not what the holographic principle is telling us about the ultimate source of all energy. In effect, every observer is creating its own holographic world due to its own accelerated motion, which gives rise to its event horizon that acts as its holographic screen when qubits of information are encoded on its horizon. 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, and the energy that characterizes that holographic world arises from the observer's own accelerated motion. The observer itself can only be understood as the central point of view of that holographic world. Different observers can only share a consensual reality to the degree their respective holographic screens overlap like a Venn diagram and share information. If different observers are free to accelerate in their own unique way, then in general there is no specific relationship between the energy that characterizes one observer's holographic world with another observer's world. Each observer is energizing its own holographic world in its own unique way due to its own accelerated motion. The mystery to be unraveled is the source of the energy that underlies the observer's own accelerated motion. As we'll come to understand, the observer's accelerated motion is relative to a motionless void, and the void is the only possible source of that energy of motion. The mystery to be unraveled is the nature of that motionless void of nothingness that is not only the source of the energy inherent in the observer's own accelerated motion, but also the source of the observer itself.

The holographic principle fundamentally reformulates quantum theory in an observer-centric and observer-dependent way since it tells us that the observer is at the central point of view of its own holographic world and that the appearance of its holographic world is dependent on its own accelerated motion. The appearance of its holographic world is understood in terms of images displayed on its holographic screen that arises as an event horizon due to its accelerated motion. The images of its own holographic world that are perceived by the observer can always be reduced to qubits of information encoded on its own holographic screen. This way of understanding quantum theory is a radical transformation of our understanding of the physical reality of the observable world that we perceive. If we really want to get our understanding of the observable world correct, we first have to get our understanding of the observer of that world correct. We have to begin with a correct understanding of the observer. The existence of the observer must come first since the observable world the observer perceives can only appear to come into existence when the observer enters into an accelerated frame of reference.

In reality, there is no objective physical reality of the world out there, only a holographic world that appears to come into existence whenever the observer enters into an accelerated frame of reference and its event horizon arises that acts as its holographic screen when its horizon encodes qubits of information. Instead of an objective physical reality of the world that the observer can perceive, there is only a subject-object relation of perception that arises as the observer perceives objects of perception in its own holographic world. Those objects of perception are all forms of information that can be reduced to qubits of information encoded on its own holographic screen.

In reality, the observer's holographic world is no more real than the projected and animated images of a computer-generated virtual reality. The observer itself creates the quantum computer that gives rise to the appearance of its own holographic virtual reality with its own accelerated motion. The quantum computer is created due to the observer's own accelerated motion that gives rise to its event horizon that acts as its holographic screen when the horizon encodes qubits of information. In reality, that holographic world only appears to exist in the eye of the beholder.



Universal Observer

The Problem of Personal Self-identification in a Holographic World

A peculiar aspect of living in a holographic world is the nature of personal self-identification. Perception always occurs in a subject-object relation, where the true nature of the subject is the observer, which is the perceiving consciousness present at the central point of view of its own holographic world, while all the observer's objects of perception are forms of information that appear in its holographic world. The observer perceives both the forms of things, which are projected like images from its own holographic screen to its point of view at the center of its own holographic world, and also the flow of energy that animates those forms. Just as the observer's holographic screen arises as an event horizon due to its own acceleration, the animating flow of energy also arises from the observer's own accelerated motion. That accelerated motion gives rise to the expression of emotional energy that animates the form of the observer's own body. The observer's body is just a form of information that appears in its holographic world, but its body is animated by the flow of emotional energy that arises from the observer's own accelerated motion. The expression of the emotional energy that animates the form of its body relative to the form of other things that appear in its holographic world is what makes the observer emotionally identify itself with the form of its body, which is called personal self-identification.

As the observer perceives the flow of emotional energy that emotionally animates the form of its body relative to the form of all other things that appear in its holographic world, the observer feels emotionally self-limited to that personal form, which makes the observer emotionally identify itself with that personal form. When the observer emotionally identifies itself with its body and takes itself to be its body, it is as though its body is the subject in the subject-object relation of perception. The observer's body is taken to be the perceiving subject, and all other objects that appear in the observer's holographic world are perceived as objects of perception.

In reality, the observer itself is the subject, and its body is just another object of perception that appears in its holographic world among all the other objects of perception, but when the observer emotionally identifies itself with its body and takes itself to be its body, it is as though its body is the perceiving subject and everything else that appears in its holographic world is an object of perception. The only thing that makes the observer's body different from all other forms is that its body is the central form and is always emotionally animated relative to the other forms, which creates feelings of self-limitation and leads the observer to identify itself with its body. This strange state of affairs is called personal self-identification, which gives rise to the observer's experience of self and other. The observer's experience of self and other within its holographic world is only possible because the observer emotionally identifies itself with the emotionally animated form of its body that appears as the central form within its own holographic world.

This explanation for personal self-identification is not new. The basic idea for this explanation was given in the 1950's, 60's and 70's by a group of psychoanalysts, who called the explanation object relations theory. In the 1990's, the neuroscientist Antonio Damasio gave a similar explanation based on the findings of neuroscience. The linguist Noam Chomsky understands the

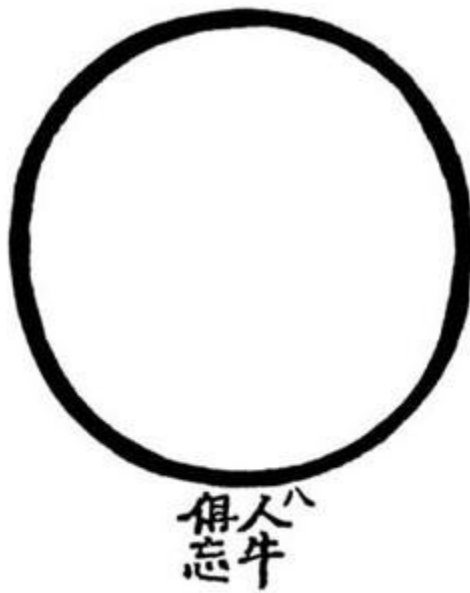
nature of language in a similar way. The basic idea is that perception always occurs in a subject-object relation, where the true nature of the subject is the observer and the object of perception is whatever the observer observes. When the observer emotionally identifies itself with its body, it is as though its body is the perceiving subject. The observer's body is always emotionally related to all other objects that appear in its world. The observer's perception of the emotional energy that animates the form of its body is what makes the observer feel emotionally self-limited to that personal form and emotionally identify itself with its body. Personal self-identification only happens as the observer perceives the flow of emotional energy that animates its body in relation to the form of all other things that appear in its world, which leads the observer to emotionally identify itself with the form of its body. With self-identification, there is a mistaken assumption that the source of the observer's consciousness is its character that appears in the holographic virtual reality world that it perceives, which is logically impossible.

To paraphrase Shakespeare, nothing is good or bad except thinking makes it so. Inherent in every thought is an emotion. All emotional expressions are body survival emotions that defend the survival of the body. When we express fear and desire, our bodies are moving toward those things that promote body survival or moving away from those things that threaten body survival. Even emotional attachments are body survival emotions, since the immature body of a child cannot fend for its own survival and must emotionally attach itself to the body of its caregiver in order to survive. Nature has designed the expression of our emotions along the lines of the pleasure-pain principle. Whatever promotes body survival feels good and whatever threatens body survival feels bad. In the sense of Darwinian evolution and the survival of the fittest body, natural selection has selected those emotions that best defend the survival of the body. When we judge things to be good or bad, in essence we are only judging things in terms of the survival of our own body. When we construct a personal self-concept, we are conceptualizing ourselves in terms of our own body, and that self-conceptualization is emotional in nature, which inherently is all about defending the survival of our own body. That's how we judge things to be good or bad, which leads to feelings of emotional self-limitation to the body and personal self-identification.

The only thing that is lacking in this explanation for self-identification is an understanding of the true nature of the observer. The holographic principle tells us the observer can be nothing more than the perceiving consciousness that arises at the central point of view of its own holographic world. That holographic world can only appear to come into existence when the observer enters into an accelerated frame of reference and the observer's event horizon arises that acts as its holographic screen when the horizon encodes qubits of information. Even the flow of emotional energy that animates the observer's body arises from its own accelerated motion.

At the level of natural selection, it seems that the expression of emotions is predetermined, but there's an aspect of free will that arises from the freedom the observer has to undergo accelerated motion in its own unique way that leads to the emotional animation of its body. The expression of free will arises from the observer's focus of attention of its consciousness, which it can focus on things in its own way and which allows its emotions to be expressed in its own unique way.

The observer is nothing more than a point of perceiving consciousness that arises at the center of its own holographic world, and all the images of its holographic world are displayed on its own holographic screen that arises in a void of nothingness. The observer's holographic screen is the boundary of its own holographic world. That boundary is an event horizon that arises due to the observer's own accelerated motion, which limits its observations of things in space and becomes its holographic screen when information is encoded. That holographic world only appears to come into existence due to the observer's accelerated motion. In reality, there is nothing inside that holographic world and nothing outside that holographic world. There only appears to be something inside the observer's holographic world due to the holographic projection of images from its own holographic screen to its point of view at the center of that holographic world.



Nothingness

The Problem of Nothingness as the Source of Everything

The observer's accelerated motion is not really along an accelerating world-line that it follows within its space-time geometry. The observer's space-time geometry is only a perceivable aspect of the holographic world it perceives that only appears to come into existence when it enters into an accelerated frame of reference. The observer's accelerated motion is relative to nothingness, which is inherently motionless. The observer's event horizon is arising within that nothingness.

What exactly is this nothingness? Theoretical physics really has no explanation for the nature of this all-pervading nothingness, which physics simply calls the void or vacuum state. In terms of the holographic principle, this mysterious nothingness is not a space-time geometry. The perceived space-time geometry of the observer's holographic world is a holographic effect that can be reduced to qubits of information encoded on the observer's own holographic screen. Like

everything else that it can perceive, the space-time geometry the observer perceives in its own holographic world is a holographic effect that only appears to come into existence due to the observer's own accelerated motion relative to that motionless nothingness.

Where does the observer come from? The answer is the observer comes from the same nothingness within which it undergoes accelerated motion. The observer's motion is relative to that motionless nothingness, which is also the source of the observer. If we think of the observer as a presence of individual consciousness at the central point of view of its own holographic world, then that nothingness can be understood as a void or empty space of pure undivided or undifferentiated consciousness. In some mysterious way, the individual consciousness of the observer, present at the central point of view of its own holographic world, is dividing or separating itself from its undivided source of pure undifferentiated consciousness, which is only understandable as a void of absolute nothingness. When the observer begins to move with accelerated motion relative to the motionless void, the observer's holographic world appears to come into existence. At the level of existence of the observer and its holographic world, the observer must come first. First the perceiving consciousness of the observer comes into existence, and then the holographic world the observer perceives appears to come into existence as the observer enters into an accelerated frame of reference. What exists prior to the existence of the observer and its holographic world? What exists when the observer's acceleration comes to an end and its holographic world disappears from existence?

What happens when that accelerated motion comes to an end? In relativity theory, the end of accelerated motion is called a freely falling frame of reference. In an ultimate freely falling frame of reference, the observer no longer has an event horizon, and therefore no longer has a holographic screen that displays images of its own holographic world. The concept of time only applies at the level of the space-time geometry of that holographic world. The observer's perception of that holographic world is like the perception of the projected and animated images of a computer-generated virtual reality. The observer's experience of time can only arise from the animation of that holographic world in the sense of the animation of the projected images of a virtual reality. In an ultimate state of free fall, the animation of the observer's holographic world comes to an end, which means the experience of time also comes to an end as the observer's own holographic world disappears from existence from its own point of view.

What happens to the observer when its experience of time comes to an end and its own holographic world disappears from existence from its own point of view? The answer is the individual consciousness of the observer returns to and dissolves back into its undivided source of pure undifferentiated consciousness, like a drop of water that dissolves into the ocean. This experience of the dissolution of individual consciousness into undivided consciousness is called spiritual enlightenment. Enlightened beings describe the experience of becoming enlightened as a state of free fall in which they fall into the void and their individual consciousness dissolves back into its source of pure undivided consciousness.

Spiritual enlightenment is a timeless state of being. The experience of time only applies at the level of the observer perceiving the animation of its own holographic world as the images of that world are projected from its holographic screen to its point of view at the center of that world and are animated in the flow of energy through that world. The animation of the observer's holographic world only arises from its own accelerated motion relative to the motionless void, which is how its event horizon arises that acts as its holographic screen. The observer's own accelerated motion is the nature of the energy that animates its own holographic world.

When its accelerated motion comes to an end, the observer's experience of time also comes to an end. When its accelerated motion comes to an end, the observer no longer has an event horizon that acts as its holographic screen, its observations in space become unlimited, but it perceives nothing as its holographic world disappears from existence. When its accelerated motion comes to an end, the observer's individual consciousness, present at the central point of view of its own holographic world, dissolves back into its source of pure undivided consciousness, like a drop of water that dissolves back into the ocean. Individual being dissolves back into undivided being. This is exactly how enlightened beings describe the experience of spiritual enlightenment.

When we focus the attention of our consciousness on appearing to live an embodied life in the world we perceive, we energize that embodied life with the expression of our emotions. We have the freedom to focus our attention in our own unique way, which leads to the expression of our emotions in our own unique way, which we call free will. The problem is that we are under the sway of Darwinian evolution and natural selection in the sense of the survival of the fittest body. We are under the sway of the pleasure-pain principle. When we express fear and desire, we are pursuing pleasure and avoiding pain. Whatever we do that promotes body survival as a desire is satisfied feels good, and rewards us for defending the survival of the body, while whatever we do that threatens body survival as a fear is manifested feels bad and punishes us for not defending the survival of the body. Our free will has become hijacked by Darwinian evolution to force us to focus the attention of our consciousness only on defending body survival as we express fear and desire in the pursuit of pleasure and the avoidance of pain, which creates feelings of emotional self-limitation to the body and leads us to emotionally identify ourselves with the body.

Once we emotionally identify ourselves with the emotionally animated form of the body, we're screwed. We feel compelled to continue to express fear and desire in the defense of body survival as though our existence depends on it. In reality, our existence does not depend on body survival, but the only way we can become aware of this fact of existence is if we become enlightened.

Spiritual enlightenment is only about discovering the true nature of our existence. At the level of being an observer of our own world, which is the level of individual existence, we can only know ourselves to be a presence of consciousness at the central point of view of that world. The only true thing we can ever know about ourselves at the level of being an observer is our own sense of being present as we perceive that world, which is the sense of I-Am-ness. That's where we have to focus our attention if we really want to awaken to the truth of what we really are.

We have to begin the awakening process by shifting the focus of our attention away from the world we perceive and refocusing our attention on our own sense of beingness. We do this because we see that the world we perceive is an illusion, like a virtual reality game that we're playing on a computer screen, and we see our character in that virtual reality world is an illusion of what we really are. When we withdraw our attention away from the world we perceive, we also withdraw our investment of emotional energy in that world that emotionally animates our character in that world. We do that because we see the whole thing is an illusion, and we lose interest in paying attention to an illusion. That's how we stop animating the illusion.

Ultimately, at the level of being a moving point of consciousness at the center of the world we perceive, when we withdraw all emotional energy away from that world, we stop moving. We not only stop emotionally animating our character, but ultimately, we stop animating the world that our character appears to live within. When we completely withdraw our attention away from that world, our accelerated motion relative to the motionless void comes to an end. We enter into an ultimate state of free fall, and the holographic world we perceive disappears from existence from our own point of view. If we remain aware of our own beingness while we fall into the void, our individual being dissolves back in the undivided being of the void, and we become aware of the true nature of our existence as that pure undivided, unlimited and timeless being.

Spiritual enlightenment is described as a return to the Source. It is the individual consciousness of the observer that is returning to its Source of pure undivided consciousness. The Source is not only the source of all the information and energy that characterize the observer's own world and the source of the laws of physics that govern events in that world, but also the source of the observer's own individual consciousness. The observer's individual consciousness is divided from the Source when the observer's holographic world appears to come into existence, which can only happen due to the observer's accelerated motion. When that accelerated motion comes to an end in an ultimate state of free fall, the observer's individual consciousness must return to the undivided consciousness of its Source. That return is described as a dissolution, like a drop of water that dissolves into the ocean. The observer's return to the Source is the nature of spiritual enlightenment, which is the only way the observer can become free from the illusion of duality.

The nature of the illusion of duality is the experience of self and other that an observer can only experience in its own holographic world. The observer only has an experience of self and other when the observer emotionally identifies itself with the emotionally animated form of a person that appears in that holographic world due to the observer's perception of emotional feelings of self-limitation to that personal form. That personal form appears as the central form of the observer's body in its own holographic world. As that personal form is emotionally animated relative to all other forms that appear in its holographic world, the observer has the experience of self and other. This experience of self and other only becomes possible when the observer emotionally identifies itself with the form of its body, which is the central form that appears in its holographic world. When that personal self-identification comes to an end, the observer's experience of self and other also comes to an end, and the illusion of duality comes to an end.

The observer lives in a state of emotional bondage due to its emotional self-identification with the emotionally animated form of a person that appears in the holographic world it perceives. The observer falsely identifies itself with the central form of a person that appears in its own world due to its perception of emotional feelings of self-limitation to that personal form. When the observer returns to the Source and discovers the truth of its own existence as pure undivided, unlimited and formless consciousness, it becomes free from this state of emotional bondage. Only consciousness itself has real being, the sense of I-Am-ness, the sense of being present. Even that sense of I-Am-ness is not the ultimate state of existence that can only be described as pure undivided, unlimited, timeless being. The forms that appear in a holographic virtual reality are unreal, no more real than projected and animated images of a holographic world, and have no being. In the words of the Bhagavad Gita: *The unreal has no being; the real never ceases to be.*

What is the nature of God? The world we perceive is built upon three fundamental ingredients: information, energy and consciousness. Perception of the world always occurs in a subject-object relation as an observer perceives its objects of perception. In physics, we call the perceiver the observer and call the objects of perception the observables. Modern physics tells us the observables are constructed out of nothing more than information and energy. Spirituality tells us that the observer is nothing more than a focal point of consciousness. The individual spirit is present as a presence of individual consciousness at the central point of view of the holographic world that it perceives. That holographic world only appears to come into existence due to its own accelerated motion as a point of consciousness relative to the motionless void, which is how all energy arises. That accelerated motion gives rise to its own event horizon that acts as its holographic screen that displays all images of its own holographic world as qubits of information are encoded on the horizon. The perception of time, as an aspect of the space-time geometry of that holographic world, can only arise from the animation of that world, which fundamentally arises from the observer's own accelerated motion.

The holographic world we perceive is just like a computer-generated virtual reality that consists of nothing more than forms of information encoded on a holographic screen that are projected like images from the screen to our point of view and are animated in the flow of energy that arises from our own accelerated motion. At the level of individual being, we can only know ourselves to be a point of consciousness at the center of our own holographic world. When we undergo the experience of spiritual enlightenment, we know that the source of our individual being is an ocean of pure undivided being. That ocean of pure undivided being can only be described as a void of absolute nothingness.

Spirituality tells us that what we call God is the Source of all information, energy and consciousness. Take away all that information, energy and consciousness, and what remains? The answer is nothing. What we call God is that ultimate nothingness, which is the Source of everything, including our own individual consciousness. That absolute nothingness is only describable as a void of pure undifferentiated consciousness.

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