

Recent Conversations on the Nature of Nonduality

Intro: Conventional science has the whole thing ass-backwards. Conventional science mistakenly assumes that a world of matter, energy, space and time exists; that in that 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. In reality, a void of undifferentiated consciousness timelessly exists, motionless, unlimited and undivided. In that void, a point of perceiving and illuminating consciousness arises at its own individual point of view. When that individual point of consciousness moves relative to the motionless void, an event horizon arises that surrounds the observer's central point of view and limits its observations of things in space. The observer's event horizon becomes its holographic screen when its horizon encodes qubits of information. The observer's holographic world only appears to come into existence from its point of view at the center of that world due to its own motion that gives rise to its event horizon that becomes its holographic screen as its horizon encodes information. The observer's holographic world only appears to come into existence like the projected and animated images of a computer-generated virtual reality that's displayed on a computer screen. Everything the observer can perceive in its own holographic world is a projected form of information that's animated in the flow of energy that arises from its own motion. The emotionally animated form of a person that appears within that holographic world is like the central character of a movie or an avatar that appears in a virtual reality movie. There is only an illusion that the form of the person has personal consciousness when the observer emotionally identifies itself with that emotionally animated personal form.

Hi J

I just found your article ***Advaita, Consciousness and Quantum Physics***. I'm very interested in this topic. For more than forty years I have been researching about a spiral, fractal, holographic, toroidal and entropic-syntropic pattern in the evolutionary dynamics, that leads to a point of Singularity —Omega— in two centuries and reveals the essential non-duality of energy and consciousness in the universe.

I'm sending you a link to my work ***Beyond Darwin: The hidden rhythm of evolution***, a resume of this transdisciplinary research:

http://byebyedarwin.blogspot.com/p/english-version_01.html.

(Here you can find versions in Spanish and English and optional PDF in both languages). I specially suggest you take a look at ***Addendum 7: Entropic-syntropic evolution*** (where I highlight the resonance between my research and the Transactional Interpretation of Quantum Mechanic by John G. Cramer and Ruth E. Kastner) and ***Addendum 8: The evolutionary dance of Emptiness*** (where it is proposed how fundamental non-duality generates, instant after instant, the entirety of the universe).

All the best,

José

Hi Jose

It seems my approach is somewhat different than yours, although at some level they may be equivalent. I accept the recent research findings of quantum gravity that are explored at Stanford (Lenny Susskind), the Princeton Institute for Advanced Study (Juan Maldacena), Berkeley (Raphael Bousso), and the Kavli Institute in Santa Barbara. I'm particularly interested in matrix models (non-commutative geometry) as proposed by Tom Banks. What unifies all these approaches is the idea of the holographic principle as the most fundamental principle of physics, more fundamental than the principle of equivalence underlying the idea of gravity or the idea of unitary time evolution underlying all quantum field theories and particle physics. My approach is purely one of interpretation of the holographic principle, and in this regard it is similar to the approach Amanda Geffer took in her recent book *Trespassing on Einstein's Lawn*, where she tried to make logical sense of the holographic principle. I've taken the logical argument farther than Geffer took it to make it consistent with the idea of non-duality and the testimony of enlightened beings, particularly Nisargadatta Maharaj. Much to my amazement, I've discovered that this logical argument is completely consistent with what enlightened beings say about the nature of reality in the sense of the concept of non-duality, which I would summarize as non-dual awareness (best understood as a void of undifferentiated consciousness) as the source of everything, which not only includes the perceivable world, but also the central point of view of the individual consciousness of the observer of the perceivable world. In the language of Advaita, the void is Brahman and the observer is Atman. The perceivable world is being displayed on a holographic screen, like the projected and animated images of a holographic virtual reality movie, and is being perceived from the central point of view of the observer. That holographic screen arises as the observer's event horizon due to its own accelerated motion. The observer's event horizon becomes its holographic screen when the horizon encodes qubits of information (hence the idea of a matrix model). I accept the idea of qubits of information encoded on a holographic screen as the fundamental dynamical degrees of freedom for a holographic world along the lines of the recent Nobel prize being awarded for research in quantum entanglement. The laws of physics (for gravity, electromagnetism and the nuclear forces) naturally arise in that holographic world as thermodynamic equations of state when things are near thermal equilibrium, as nicely demonstrated by Ted Jacobson. In effect, the observer is creating its own quantum computer (due to its own accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon), and that quantum computer is what gives rise to the appearance of the observer's own computer-generated holographic virtual reality world. The laws of physics are like the computational rules that govern the operation of the quantum computer when things are near thermal equilibrium. The idea of multiple observers (each present at the central

point of view of its own holographic screen) sharing a consensual reality naturally arises when those holographic screens overlap like a Venn diagram and share information. This nicely resolves all the observational paradoxes of quantum theory, like the Schrodinger cat/Wigner friend paradox and the paradox of spooky action at a distance.

More importantly, it gives a natural scientific explanation for the nature of spiritual enlightenment as described by enlightened beings like Nisargadatta. The observer's accelerated motion is always relative to the motionless void. When that accelerated motion comes to an end in an ultimate state of free fall, the observer's holographic world disappears from existence from its own point of view and the observer's individual consciousness, present at the central point of view of its own holographic world, dissolves back into the undifferentiated consciousness of the void like a drop of water that dissolves back into the ocean. This state of dissolution into non-dual awareness is how the experience of enlightenment is described by all enlightened beings.

With regard to the idea of evolution, I'm perfectly happy with the idea of Darwinian evolution as currently understood in terms of natural selection and the survival of the fittest body, which at least to some degree has a thermodynamic explanation. From my point of view, all evolution takes place in the observer's own holographic virtual reality world. Consciousness does not evolve. The individual consciousness of the observer, present at the central point of view of its own holographic world, can only be present to observe the events of its own holographic world, or that individual consciousness can return to its source of pure undifferentiated consciousness through a process of dissolution into unlimited and undivided nothingness.

One last idea. For some time now I've had the idea it might be fruitful to undergo a series of debates about the nature of reality, where I would discuss the holographic principle and my debating partner would explore some other idea, and where we would try to shoot down each other's ideas due to their inherent logical contradictions and inconsistencies. A good forum for such a debate might be the Science and Nonduality Conference held each year in California, but an alternative could be a Zoom conference held online. Does this idea interest you at all?

Hi J

Thank you very much for your tasty mail and for the three articles that you attached to me! Rest assured that I will read them with great interest.

I will tell you the story. More than four years ago, I read some texts on a page titled **Science and Nonduality** that I found fascinating. One of them, entitled ***It's All in the Mind***, I liked it so much that I transferred it to Spanish with the Google translator. I downloaded it on paper and I still keep it in the folder of articles of great importance. I

wanted to contact the author, but since I couldn't find his name anywhere, I wrote the following email to the *Science & Nonduality* website of Maurizio and Zaya Benazzio:

Dear friends,

*I just read the article **The Internal-External Connection: Source to Cosmos**, published on October 26 at <https://scienceandnonduality.wordpress.com/> . I'm fascinated! I have a huge interest in contacting the author of this work. His name does not appear anywhere. Could you, please, give me his name from him and his e-mail address from him to be able to comment with him on the enormous coincidences between my research on the universal evolutionary dynamic and the content of the aforementioned article?*

I await your news with great interest. My biggest congratulations to everyone for your wonderful web!

*All best,
José*

Maurizio answered me like this:

Dear Jose

This site has nothing to do with us...:-)

Not sure who it is writing that stuff (and I wish to put no judgment of it is good or bad) but surely has nothing to do with our org. Someone is using our name without our permission...

Love, M.

I think I've finally found the author, right? I'm in luck!

You say in your email that "*Consciousness does not evolve*". I fully agree with you that consciousness itself does not evolve at all, but that statement must be completed by saying that the actualization of that consciousness in the manifested world does evolve depending on the complexity of the entities or organisms with which it is successively identifying.

As I see it, any materialist approach—including Darwinism and neo-Darwinism—is completely unable to explain the progressive emergence of consciousness through the evolutionary process, and likewise unable to explain the evolutionary pattern that my research shows. The key to all this is that the emergence of phenomena in the universe is not only a function of the initial conditions —energy pole—, but also depends on a

final attractor —consciousness pole—. This subject-object polarity (consciousness-energy) is nothing more than the dual expression of fundamental non-duality, as affirmed by the great wisdom traditions. And, precisely, taking this idea into account, I believe that our respective approaches are essentially compatible, since, as you affirm, “**The consciousness of the observer** arises from the same ultimate reality from which **the physical universe** arises.” [The **bolds** are mine]. That is the central key of my proposal!

I strongly invite you to take a look at **Addendum 7** and, above all, at **Addendum 8** —I am attaching you both addenda—, because there you will be able to know my approach to how fundamental Emptiness is creating, instant after instant, the entire evolutionary holographic universe.

Regarding your suggestion about possible debates on the nature of reality, I have to tell you that I can't participate in them because I don't know English —everything I read and write in this language (this email included) I do it through from Google translate—and, on the other hand, since I'm not a physicist, I could hardly debate with you on this ground. In any case, I will be happy to answer you by email any question you want to ask me.

Another thing! I'd like to contact Amanda Geffer as well, but I can't find her email address anywhere. Could you provide it to me?

The next few days I will read with great interest the articles that you have attached to me. I'm sure I'll have a lot of fun with them! If I have any suggestions to make when I finish them, I'll get back to you.

Hi Jose

My initial reaction to your response is *I agree with everything you say!*

First point: Consciousness does not evolve because undifferentiated consciousness is timeless and unchanging in nature. That's the nature of the void. It's the primordial nature of existence. It is what exists when everything else disappears from existence. It is what exists when time comes to an end. Time in the sense of a dynamically curved space-time geometry, as formulated in Einstein's theory for gravity, only exists at the level of a holographic world, which is best understood in terms of a computer-generated virtual reality world, like depicted in the Matrix. The undifferentiated consciousness of the void is what timelessly exists when that holographic world disappears from existence. There's nothing mysterious here. It's what happens each night when we fall

into a deep sleep and we become aware of nothing. The only tricky part in the sense of becoming spiritually enlightened is remaining aware of our own being as we fall into the void and as everything else disappears from existence from our own point of view. A holographic world always disappears from existence from the central point of view of its observer as the observer enters into an ultimate state of free fall. The only tricky part is for the observer to remain aware of its own individual beingness, present at its own individual point of view, as that individual being dissolves back into the undivided being of the void. While the undivided being of the void is timeless, the individual being of the observer is always present now, in the present moment. That's why present moment awareness is an essential condition for becoming spiritually enlightened.

Second point: There is only an illusion that the individual consciousness of the observer evolves prior to becoming spiritually enlightened. The more accurate characterization of this process is a devolution. The problem is personal self-identification. As you correctly point out, all perception occurs in a subject-object relation, where the observer is the nature of the subject, which can also be called the Self, and its object of perception is the emotionally animated form of a person that appears as the central form of information in its own holographic world. That personal central form of information is always emotionally animated relative to all other forms that appear in that world. Personal self-identification only occurs because the observer feels emotionally self-limited to that personal form as the observer perceives the emotional energy that animates that personal form relative to all other forms, which creates the dualistic illusion of self and other. In reality, the observer is nothing more than the individual consciousness present at the central point of view of its own holographic world, but when the observer emotionally identifies itself with its emotionally animated personal central form, it is as though this personal form is the subject in the subject-object relation of perception, which creates the dualistic illusion of self and other. This dualistic illusion is only created because of feelings of emotional self-limitation to a personal form as emotions are expressed that animate the form of the person. The problem is the expression of emotions, which at the level of Darwinian evolution are all survival emotions that defend the survival of the body in the sense of the survival of the fittest body. That's how emotions evolve. They defend the survival of the body. In a very real sense, we are all prisoners of our Darwinian conditioning, which doesn't just occur over a single lifetime, but over millions of life-times. Emotions evolve to defend the survival of the body. That's what the survival of the fittest body is all about. Once we emotionally identify ourselves with our own body, we're screwed. We feel compelled to defend the survival of our own body as though our existence depends on it. That's how we're conditioned by Darwinian evolution. The way this works is through the pleasure-pain principle and the expression of fear and desire. We are constantly pursuing pleasure as we express desire and avoiding pain as we express fear in order to defend the survival

of our body, which we do as though our existence depends on it. That's what keeps us emotionally self-identified with the emotionally animated personal form of our body.

The only way we can break-free from our Darwinian conditioning is if we stop expressing self-defensive and self-limiting emotions, which is not an evolution, but a devolution. That's why we have to surrender to divine will and give up the expression of our own personally biased self-defensive individual will, which in reality only defends a personal illusion of what we really are in the sense of a personal self-concept. In addition to surrendering to divine will, we also have to sever emotional attachments. When we sever an emotional attachment to something, it feels like something dies inside because part of our emotionally energized, mentally constructed, body-based personal self-concept dies away when we stop caring about that thing and that thing becomes dead to us. Our self-concept is always constructed in an emotional relationship between our body and some other thing. Ultimately, we have to sever our emotional attachment to the personal form of our own body, which is like the central character in the holographic virtual reality movie that we're watching from our own point of view at the center of that holographic world. When we stop caring about the life our character appears to live in that world and sever the emotional attachment to our own character, our character becomes dead to us. That's how we cut the knot of personal self-identification and stop emotionally identifying ourselves with the emotionally animated form of a person. When we sever the emotional attachment, we're able to step out of the world we perceive and see that world from the outside as our consciousness rises to a higher level. We see that world like a movie that we're watching as all the animated images of the movie are projected from the movie screen to our own point of view in the movie audience outside the screen. We see that the person we mistakenly took ourselves to be is only the central character of the movie. We see that the whole thing is an illusion and is imaginary in nature. When we see the illusion as an illusion, we naturally lose interest in paying attention to an illusion. That's when we can really withdraw our attention away from the illusion and look within. When we withdraw our attention away from the illusion, we also withdraw our investment of emotional energy in the illusion that emotionally animates our character in the illusion. When we totally withdraw our attention away from the illusion, we withdraw all energy away from the illusion. That's when our own motion as a moving point of consciousness relative to the motionless void comes to an end and we enter into an ultimate state of free fall. If we remain aware of our own beingness while we fall into the void and as our own holographic world disappears from existence from our own point of view, our individual being, present at the central point of view of our own holographic world, dissolves back into the unlimited and undivided being of the motionless void, like a drop of water that dissolves back into the ocean. Individual consciousness dissolves back in the nothingness of pure undifferentiated consciousness.

If you carefully read *I Am That* by Nisargadatta, you'll see these are exactly the instructions Nisargadatta gives for how to become spiritually enlightened. Spiritual enlightenment is the nature of awakening from the dream. After spiritual enlightenment, one also awakens within the dream. One becomes aware of one's Self as a moving point of consciousness at the center of one's own world. One sees how the motion of one's Self is animating all the images of one's own world, like the images of a movie. One sees how the light of consciousness, emanating from the central point of view of one's own Self, is projecting and illuminating those images. One sees how one's Self perceives those images as the images are reflected from a screen back to one's Self. One sees all of this from the darkness, emptiness and silence of the void.

Third point: I've spoken with Maurizio at the Science and Nonduality Conference several times and have tried to explain the holographic principle to him, but this is like talking to a brick wall. This is very odd since the whole original motivation for the Science and Nonduality Conference was to fulfill Nisargadatta's final wish that his teachings be given a scientific basis, and the holographic principle is the natural scientific basis for Nisargadatta's teachings. The holographic principle, properly understood in terms of the consciousness of the observer, gives a perfectly good scientific explanation for these teachings, and there is absolutely no inconsistency or logical contradiction. The problem as I see it is that people speak out of both sides of their mouth, or as the Native Americans put it, people speak with a forked tongue. People say that they want to know the answer, but if that means they have to accept that their own ego is an illusion of what they really are, they really don't want to know the answer. Ego will believe any logical contradiction it has to believe in order to defend the survival of its own illusory existence. If the holographic principle threatens the survival of that illusory existence of ego, then the attitude of ego is, let's not look at the holographic principle.

Fourth point: I communicated with Amanda Geffer several years ago, but she was very resistant to the idea of understanding the nature of consciousness in terms of the undifferentiated consciousness of the void (Brahman) as the source of the individual consciousness of the observer (Atman) at the central point of view of its own holographic world. This is odd since her whole thesis was based on the idea of the observer, which she correctly identified as an accelerated frame of reference that gives rise to an event horizon that acts as the observer's holographic screen when information is encoded on the horizon. This is also odd since her final conclusion was that nothing is ultimately real. This is also odd since she worked closely with her father, who is a Buddhist, and Buddhism accepts the ultimate reality of nothingness. My impression is that like most scientifically minded people, she is completely hung up on the idea of physicalism, and is not willing to attribute any spiritual aspect to the nature of reality. For

the physicalists, there is no reality except for physical reality. The idea of a spiritual reality is anathema to them. This of course is just another one of the logical contradictions ego will use to defend its own illusory existence. The physicalists are unwilling to concede that spiritual reality is the reality of consciousness, which is beyond the physical reality that it perceives. Again, this is very odd since Gerter's understanding of the holographic principle is perfect, which tells us in no uncertain terms that the consciousness of the observer can never be reduced to something that it can observe in its own holographic physical world. That physical world is always defined by the way information is encoded on the observer's event horizon that arises from its own accelerated motion. The observer can only be understood as the perceiving consciousness present at the central point of view of its own holographic world, which is defined on a holographic screen that delineates the bounding surface of that holographic world. You can't collapse the boundary of that world into the central point of view and still have a world. All attempts to reduce the consciousness of the observer to something that the observer can observe in its own holographic world only result in the logical contradiction of a paradox of self-reference. At some level, Geffer understood this when she wrote her book, but for some reason, most likely the irrational reluctance that all physicalists have to the idea of a spiritual reality beyond the physical world that bubbles up from the resistance of ego, she was unwilling to take the next step and draw the obvious conclusion that the source of consciousness is beyond the perceivable physical world that consciousness perceives.

Last point: I hope this is OK with you. I posted our initial conversation on the Sadhu-Sanga Google group website as Advaita, Consciousness and Quantum Physics Revisited:

If it's OK with you, I'd like to make these conversations public, which in some sense, serves the purpose of a debate and allows other interested people to chime in and make their own comments. There's real value in making this kind of knowledge public. I know of no other way to whittle away at the resistance of ego.

Let me know. I'll send you more feedback after I read your articles.

Hi Jose

My thoughts on Addendum 7:

As best I can tell, all of your analysis is based on the conventional formulation of quantum theory and quantum field theory in terms of unitary time evolution. You are only including the advanced waves of Feynman-Wheeler with the retarded waves in order to connect the past to the future in an inextricable way. The problem as I see it is that this

approach can never include the effect of gravity, since as formulated by Einstein's field equations, gravity is the dynamical curvature of a space-time geometry, which can never be understood in the sense of unitary time evolution, which is only a valid concept in gravity-free Minkowski space, where there is a notion of time translation invariance. In other words, gravity is not consistent with quantum theory as conventionally formulated. This is why you have to go beyond the idea of unitary time evolution to the holographic principle, which does not suffer from this logical contradiction. How would you re-express your ideas in terms of the holographic principle?

My thoughts on Addendum 8:

I really have no problem with anything you're saying here, except to again point out the contradiction between the unitary time evolution of quantum theory and the dynamically curved space-time geometry of gravity. How would you re-express these ideas, not in terms of point particles that exist and move through the space-time geometry of a universe, but in terms of qubits of information encoded on a holographic screen? You really can't talk about a holographic world unless you can explain the nature of the hologram, which Bohm never did. Bohm seems to have been completely oblivious to the work of Wheeler and Bekenstein. The poles that you describe, between an observer and its object, between consciousness and energy, need one more ingredient, which is information, hence the role of qubits encoded on a holographic screen. This is where you need to include some sort of discussion of the holographic principle. The big mystery of course is how we get from the non-dual reality of the void to the dualistic reality of an observer and its holographic world. I don't think this mystery is solvable in a scientific sense except to say that in some mysterious way the undifferentiated consciousness of the void differentiates itself into the point of view of the observer whenever that point of consciousness begins its accelerated motion relative to the motionless void, which gives rise to the observer's event horizon that becomes its holographic screen when qubits of information are encoded on the horizon. The reverse process of that accelerated motion coming to an end in an ultimate state of free fall is a bit easier to understand in the sense of the dissolution of that individual point of consciousness into the undifferentiated consciousness of the void, like a drop of water that dissolves back into the ocean.

Other than my suggestion that you incorporate the holographic principle into your discussion, I basically agree with everything you say. This is really a tremendous piece of work that pulls together a large number of threads. You only need to add one more critical ingredient, which is the nature of information. Instead of talking about quantum fields, as in the Wheeler-Feynman theory of the advanced and retarded potentials of electromagnetism, you need to talk about information at the level of qubits. Maybe an Addendum 9?

Hi J

Thank you very much for your very interesting emails and your articles! I intended to answer you when I had read all those texts completely, but, although I have only reached page 50 of the titled ***The Underlying Truth of You and the Story of Reality***, I am so fascinated with your work that, before finishing reading everything, I would like to tell you right away my enthusiasm for the load of highly suggestive ideas that you propose and for how pedagogically you expose them despite their complexity. There are some technical nuances that I am not able to fully grasp, but your insistence on highlighting the key points of your proposal makes the article much easier to read. My best congratulations on this marvelous overview of integral reality, Jim!

From my point of view, everything I'm reading seems to me to be very much in tune with the conclusions of my evolutionary research. The problem that you pose with the "*effect of gravity*"... for me, who is not a physicist, is beyond my ability to understand. You speak of "*unitary time evolution*"... according to my proposal, time is illusory and everything happens instant after instant, in an eternal Now... is this not acceptable?...

As I understand things, based on both experiential and theoretical research on non-dual reality, the foundation of everything transcends and includes the partial perspectives of objectivist monism (materialism) and subjectivist monism (idealism), that is, it is subject-and-object simultaneously and in an undifferentiated way, or, more exactly, is "prior" to that polarization. The origin of the manifested universe is simply the apparent dualization of the non-dual in the form of the poles of **energy** and **consciousness**. The **information**, according to this approach, would only be the interaction between these two poles, from the very originary moment, which would gradually increase, instant after instant.

You say: "*Maybe an Addendum 9?*". Ha!, ha!, ha!, just yesterday I had the crazy idea of adding an Addendum 9... with the only content being a link to your *Science & Nonduality* page!...

As I see that, apart from your powerful theoretical approach to non-duality, you are also interested in its experiential aspect, I invite you to take a look at the PDF of the ***Non-Dual Evolution*** text that you can find at the head of my blog: http://byebyedarwin.blogspot.com/p/english-version_01.html. It has three chapters. The first is basically the article *Beyond Darwin* and the 8 *Addenda*, the second deals with the philosophical implications of my evolutionary research from a non-dual perspective, and the third is an invitation to the reader to experientially discover that non-dual foundation that originates and welcomes, from moment to moment, the totality of manifested reality.

These last two chapters are literal translations of some sections of my book ***Siendo nada, soy todo*** (*Being nothing, I am everything*) —published in Spanish by Ed. Dilema in 2007—, of which you can find the PDF at the head of the Spanish version of my blog.

Ah!, of course!, you can publish my texts and my emails in the way that you consider most appropriate. Try not to be too cruel to me!

Thanks for everything! Congratulations on everything! I will continue to read your articles with great interest...

Hi Jose

Thank you for the kind words of your reply.

I have a few more comments about your Addendums.

I agree that everything happens now, in the present moment, since the observer only exists in the present moment. Spiritual awakening always begins with the observer becoming aware of its own existence, which is its sense of being present, in the present moment. The whole point of focusing attention on the now, with present moment awareness, is to become aware of our own being as a presence of consciousness.

I agree the perception of time is an illusion, but as is clear from your work, you want to understand how that illusion is created. We have the impression of an unchangeable past and an undetermined future, but even at the level of classical Newtonian physics, the future is determined by the past, since once you know the initial conditions, it's possible to calculate the final conditions in a deterministic way. At the level of quantum theory, we have to assume an initial condition and a final condition and then sum over all possible paths that connect the initial condition to the final condition. Each path is weighted with a probability factor given in terms of the action as $P = \exp(iA/\hbar)$, where the action is given in terms of kinetic and potential energy as an integral, $A = \int dA$, over $dA = dt(KE - PE)$. The wave-function of quantum theory arises from this probability factor. The time variable in the integrand is the time variable assumed for unitary time evolution of the wave-function. The classical path is understood as the path of least action, which is the most likely path in terms of quantum probability. This formulation not only applies to the ordinary quantum theory of particle physics, but also to quantum field theory. In QFT the sum over all possible paths that connect an initial condition to a final condition includes virtual particle-antiparticle pairs, where the antiparticle has a negative energy and frequency, $E = hf$, and so can be understood as a particle that moves backwards in time. This is where the idea of advanced and retarded waves comes from. At the level of QFT, the future is as much determining the past as the past is determining the future.

I like the idea that the future determines the past as much as the past determines the future, and that in some sense, the future and the past are both illusions of perception since everything is observed now, in the present moment, which is where the observer exists. In the sense of an illusion, I would say that both the future and the past are imaginary in the same sense that the projected and animated images of a movie are imaginary. This of course brings us to the problem of how to understand a holographic world, which is also imaginary in the same sense as the projected and animated images of a movie.

The bottom line is that the space-time geometry of a holographic world is also imaginary, since it only arises from the perception of images projected from an observer's holographic screen to its central point of view. The images of that world are forms of information reducible to qubits of information encoded on the screen which are animated in the flow of energy. The problem with understanding the nature of that space-time geometry is the problem of understanding gravity as the dynamical curvature of that space-time geometry.

This is where the idea of gravity conflicts with the idea of unitary time evolution that underlies quantum theory. Quantum theory can only be formulated in the gravity-free Minkowski space of special relativity, where there is a notion of time translation invariance. This notion breaks down in a dynamically curved space-time geometry with gravity. This breakdown of time translation invariance in a curved space-time geometry with gravity is best exemplified by event horizons, like the event horizon of a black hole.

There are several ways to see this. The first is Hawking radiation. At the event horizon of a black hole, virtual particle-antiparticle pairs appear to separate as observed by an external observer. The separated particle is radiated away from the event horizon toward the external observer and appears to become a particle of thermal radiation that carries positive heat energy, while the separated antiparticle falls into the black hole and carries negative energy that reduces the mass of the black hole. This is a separation of positive and negative frequencies as in the separation of advanced and retarded waves. This separation of virtual particle-antiparticle pairs at the event horizon gives the event horizon an apparent temperature as observed by the external observer. On the other hand, for a freely falling observer that falls through the event horizon, there is no Hawking radiation, which only appears to exist for the external observer that must accelerate away from the event horizon with an acceleration equal and opposite to that of gravity to maintain its stationary position outside the event horizon. The paradox we have to resolve is how Hawking radiation can appear to exist for the accelerated external observer but not for the freely falling observer.

The other way to demonstrate the breakdown of the observer's space-time geometry at an event horizon is with the Planck length as the smallest possible measurable distance

scale. The way we measure the size of things is by scattering light off of them, as with a microscope. The smaller the thing, the smaller wavelength of light we need to use. Since energy is related to wave frequency as $E=hf$, and wave frequency is inversely proportional to wavelength, the smaller the thing, the larger the energy of the light we need to use. At some point, we focus so much energy into such a small region of space, we create a black hole. If we focus even more energy into even a smaller region of space, we only make the black hole bigger with a larger event horizon. The length scale at which the black hole must form is the Planck length, which is the smallest distance scale we can ever measure since nothing is observable beyond the limits of the event horizon.

This is how Jacob Bekenstein discovered holographic entropy. Bekenstein imagined throwing a single photon, which is a quantum of electromagnetic radiation, and for which we know nothing about except for its polarization state, into a black hole. This photon carries a single qubit of information in terms of its right handed or left handed polarization state, which is like a spin variable that can only be observed to spin up or spin down. When this photon is added to the black hole, the event horizon of the black hole increases in surface area by about one Planck area. It is as though the surface area of the event horizon is covered with Planck area size pixels, each of which encodes a single qubit of information.

This explains why the Planck length is the smallest distance scale that can ever be measured. A Planck size black hole is the smallest event horizon that can be created, which encodes a single qubits of information, which is the smallest amount of information that can ever be measured.

The Hawking calculation for the apparent temperature of the event horizon of a black hole as observed by an external observer and the Bekenstein calculation for the holographic entropy of a black hole tie together in terms of the laws of thermodynamics. At thermal equilibrium, the equipartition of energy tells us that every fundamental dynamical degree of freedom carries the same amount of the thermal energy given in terms of temperature as $E=kT$, and that entropy is given in terms of the number of dynamical degrees of freedom as $S=kn$. Bekenstein showed the dynamical degrees of freedom for the black hole are qubits of information encoded on the event horizon, with one qubit encoded per Planck area size pixel, and so the black hole's holographic entropy is proportional to the surface area of the event horizon. Hawking showed the observed temperature of the event horizon is proportional to the acceleration of gravity with which an external observer must accelerate away from the event horizon to maintain its stationary position outside the event horizon. The laws of thermodynamics simply say that a decrease or increase in the surface area of the event horizon, which corresponds to a decrease or increase in the number of qubits of information encoded on the event horizon, either corresponds to the radiation of Hawking radiation away

from the event horizon or to the addition of photons of electromagnetic radiation to the black hole, which either decreases or increases the mass of the black hole in terms of the thermal energy carried by that radiation, which is proportional to the observer's acceleration. This thermodynamic addition and subtraction process always occurs in terms of an integral number of qubits encoded on an observer's holographic screen because the emitted and absorbed radiation also carries information in terms of qubits.

If we generalize these ideas of Bekenstein and Hawking from black holes to the entire observable universe, we can then deduce the holographic principle, which describes the nature of an accelerating observer and its holographic world. The basic idea is that just as a black hole has an event horizon from the perspective of an accelerating observer that hovers outside the black hole in a stationary position, the observer's holographic world also has an event horizon. This event horizon, which bounds the observer's own observable holographic world, is called a cosmic horizon that arises from 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 appears to expand away from the observer's central point of view. With the accelerated expansion of space, the farther the observer looks out into space, the faster the expansion of space appears to accelerate away from the observer. At its 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 own cosmic horizon.

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 its own 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 observer's screen to its own point of view at the center of its own holographic world. 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".

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.

Once we have an accelerating observer and its event horizon, which naturally arises as a bounding surface of space that limits the observer's observations in space due to its own accelerated motion, we can then construct the observer's holographic world. 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.

The way the holographic principle solves the problem of the fundamental dynamical degrees of freedom for a holographic world at the quantum level is to assume that these fundamental dynamical degrees of freedom are qubits of information encoded on a holographic screen that arises as an event horizon in an observer's accelerated frame of reference. The qubits encoded on a holographic screen are more fundamental as dynamical degrees of freedom than the point particles assumed by QFT that appear to occupy position coordinates in space and to move through space over the course of time in the space-time geometry of the observer's holographic world. The holographic principle is the only known mechanism that can unify gravity, understood in the sense of a dynamically curved space-time geometry, with the particle physics of QFT, which must assume that space-time geometry is flat, gravity-free Minkowski space.

The holographic principle specifies that the number of qubits of information encoded for a holographic world, which are the fundamental dynamical degrees of freedom for that holographic world, are given in terms of the surface area of the observer's event horizon as $n=A/4\ell^2$, where the Planck area is defined as $\ell^2=\hbar G/c^3$. It is as though each Planck area on the observer's event horizon encodes a single qubit of information, like pixels on a computer screen that encode bits of information in a binary code of 1's and 0's.

This encoding of qubits of information on an event horizon is more complicated than the way a classical computer encodes information because the qubits are all entangled with each other. Quantum entanglement is a result of the way information is encoded on the two dimensional surface of the observer's event horizon in a rotationally invariant way, which results from the way qubits are mathematically represented on that surface by matrices, which are two dimensional arrays of numbers.

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 can only be observed to be 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 also gives a mathematical representation of rotational symmetry on the surface of the 2-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.

The equipartition of energy tells us that at thermal equilibrium, each fundamental dynamical degree of freedom carries the same amount of thermal energy. Where does this thermal energy come from? The answer is that this thermal energy comes from the observer's own accelerated motion. If the observer accelerates with an acceleration, a , that thermal energy is given in terms of the Unruh temperature of the observer's event horizon as $E=kT=\hbar a/2\pi c$. The accelerating observer is itself creating its own thermal energy, and at thermal equilibrium, each qubit of information, which is a fundamental dynamical degree of freedom for the observer's own holographic world, carries the same amount of thermal energy given in terms of the observer's own acceleration.

We now have all the pieces of the puzzle to explain how the laws of physics arise in an observer's holographic world. 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 $S=kn=kA/4l^2$, and the Unruh temperature of the observer's event horizon at thermal equilibrium is given in terms of the observer's acceleration as $kT=\hbar a/2\pi c$. The laws of thermodynamics simply say that $\Delta E=kT\Delta n$, where the fundamental dynamical degrees of freedom for the observer's holographic world are defined in terms of the number of qubits of information encoded on the observer's event horizon, which is proportional to the surface area of the event horizon. At thermal equilibrium, each qubit of information encoded on the event horizon carries the same amount of thermal energy given in terms of the observer's own acceleration. A change in the surface area of the observer's

event horizon implies a change in the number of qubits of information encoded on the event horizon, which implies a change in energy for the observer's holographic world.

Thermodynamics tells us that a change in energy implies a change in entropy, which the holographic principle tells us 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. This chain of events is how Ted Jacobson derived Einstein's field equations for gravity 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.

The holographic principle demonstrates that the laws of physics in a 3+1 dimensional space-time geometry can be reduced to the way qubits of information are encoded on an observer's holographic screen that arises as an event horizon in its accelerated frame of reference and to the thermal energy inherent in that accelerated motion. 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 best understood in terms of the number of qubits of information encoded on the surface of the observer's event horizon, which is called a matrix model.

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 field theories for the electromagnetic and nuclear forces, can be derived using the usual unification mechanisms of super-symmetry and extra compactified dimensions of space. At the level of field theory, the final result of unification looks like 11-dimensional super-gravity. With unification, all particle spin arises from super-symmetry, and all particle charges arise from quantized momentum in extra compactified dimensions. The electromagnetic and nuclear fields arise as extra components of the space-time metric, and all point particles are understood as quantum excitations of the fields. This also 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. The idea of the second

quantization of field theories inherent in quantum field theory 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 nature of Hawking radiation is telling us that only an accelerated observer can observe something in its own holographic world. Only the accelerated observer observes Hawking radiation. The freely falling observer observes no Hawking radiation. Hawking radiation only appears to exist for the accelerated observer due to separation of virtual particle-antiparticle pairs at the accelerated observer's event horizon. The virtual particle-antiparticle pairs are created out of nothing and normally annihilate back into nothing in a short period of time due to quantum uncertainty in energy, but at the event horizon they can appear to separate from the perspective of the accelerated observer. Since their total energy is zero, the virtual antiparticle must carry an equal but opposite amount of negative energy as the positive energy carried by the virtual particle. When these virtual particles appear to separate at the event horizon, the positive energy that's radiated away from the event horizon turns into thermal energy, while the negative energy that falls into the black hole decreases the mass of the black hole.

In terms of the holographic principle, these radiated and absorbed particles can always be reduced to qubits of information encoded on the event horizon of the black hole. If we think of the event horizon of the black hole as a holographic screen that encodes qubits of information, the apparent radiation and absorption of energy from the event horizon of the black hole is like the projection of images from the observer's holographic screen to its accelerated point of view outside the screen. The radiated and absorbed particles are forms of information that can be reduced to qubits of information encoded on the observer's holographic screen. If we generalize this idea from a black hole to an observer's own holographic world, then the form of 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 the observer's holographic screen, which arises as an event horizon due to the observer's own accelerated motion. These forms of information are projected like images from the observer's holographic screen to its own accelerated point of view outside the screen as the observer perceives the images. There really is nothing inside that holographic world since that world only consists of projected images. Even the energy that animates the projected images can be understood as arising from the energy of the observer's own accelerated motion.

That's the nature of a holographic world, where the fundamental dynamical degrees of freedom for that world are qubits of information encoded on an observer's holographic screen that arises as its event horizon due to the observer's own accelerated motion. Point particles that appear to occupy position coordinates in space and to move through space over the course of time in that world can always be reduced to qubits of

information encoded on the observer's own holographic screen. Even the space-time geometry of that holographic world can be reduced to qubits of information encoded on the observer's holographic screen.

The holographic principle explains the nature of the observed effects of gravity as the apparent dynamical curvature of the space-time geometry of an observer's holographic world, which can always be reduced to qubits of information encoded on the observer's own holographic screen that arises as its event horizon due to the observer's own accelerated motion. The problem is this explanation is not consistent with the idea of unitary time evolution that underlies the conventional quantum theory and QFT of particle physics, since in a curved space-time geometry with gravity, there is no notion of time translation invariance. We really can't connect the present moment to a distant past or far-away future with the advanced and retarded waves of QFT because the positive and negative frequencies of those waves are separated at an event horizon.

That's why I'd like you to reformulate your ideas about entropic-syntropic evolution, not in terms of a QFT based on the incorrect assumption of unitary time evolution, but in terms of the holographic principle. My guess is that you can't do this, at least not in terms of a distant past and a far-away future. My own ideas about syntropy (the order of coherent organization) as a counter-balancing effect to entropy (the disorder of thermal disorganization) is that coherent organization naturally arises in a holographic world, moment by moment, as a natural result of quantum entanglement due to the entanglement of qubits of information encoded on an observer's holographic screen, which are the fundamental dynamical degrees of freedom of that holographic world. Coherent organization of form is a moment by moment process that arises from quantum entanglement because all the qubits of information for that holographic world are entangled.

The flip side of this way of understanding coherent organization is that observation is never really a local phenomena. That's why the idea of local realism, which is inherent in our mistaken ideas about particle physics, and which seems to be violated in the phenomena of spooky action at a distance, is not a valid concept. Observation is never really a local phenomena, but rather a holistic phenomena that encompasses an observer's entire world as the observer makes observations of its own holographic world.

The observer itself can only be understood as the perceiving consciousness present at the central point of view of its own holographic world, which is always defined on the observer's own holographic screen that arises as an event horizon due to its own accelerated motion. The observer's event horizon becomes its holographic screen when the horizon encodes qubits of information. That information is always entangled in the sense of quantum entanglement, and so everything perceivable in that holographic

world is inherently connected to everything else. Coherent organization of form naturally arises from the tendency of entangled qubits of information to align together over a sequence of events, which occurs moment by moment.

The key to understanding the nature of observation in a holographic world is that observation is never a local phenomena. There is only an illusion that the form of a person that appears in the observer's own holographic world can make a local observation of that world. In reality, all observations are non-local and are made by the observer at the central point of view of its own holographic world. Observation always occurs in a subject-object relation, where the observer is the subject and its objects of perception not only include forms of information in its own holographic world, but that world in its entirety. This not only resolves the paradoxes of spooky action at a distance, but also those of Schrodinger's cat and Wigner's friend.

As I've previously mentioned, there is only a consensual reality shared by multiple observers, each present at the central point of view of its own holographic world, when the respective holographic screens of all the different observers overlap like a Venn diagram and share information.

In terms of non-dual reality, all of this is happening in the nothingness of the void. Each observer, present at its own individual point of view, is arising in that nothingness as the observer's individual consciousness is differentiated from the undifferentiated consciousness of the void. The accelerated motion of each observer is always relative to the motionless void, which is how each observer's event horizon arises that becomes its holographic screen when the horizon encodes qubits of information. Just as the void is the source of the observer, 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 encoding on the observer's event horizon.

If I can quote you back to yourself:

"According to my proposal, time is illusory and everything happens instant after instant, in an eternal Now...As I understand things, based on both experiential and theoretical research on non-dual reality, the foundation of everything transcends and includes the partial perspectives of objectivist monism (materialism) and subjectivist monism (idealism), that is, it is subject-and-object simultaneously and in an undifferentiated way, or, more exactly, is "prior" to that polarization. The origin of the manifested universe is simply the apparent dualization of the non-dual in the form of the poles of **energy** and **consciousness**. The **information**, according to this approach, would only be the interaction between these two poles, from the very originary moment, which would gradually increase, instant after instant."

I agree.