

## Thinking “*Outside the Box*”

Anthony DiCarlo, February 2011

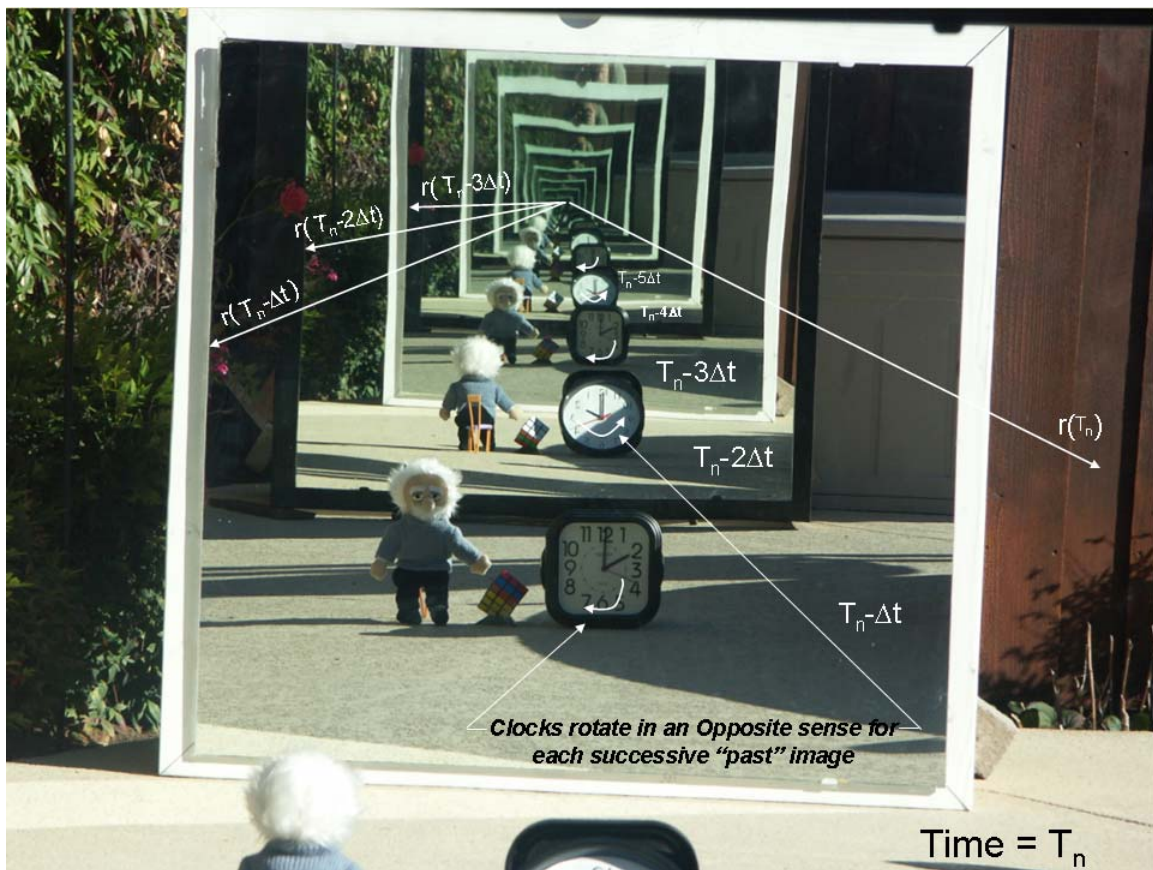
### ABSTRACT

This essay supports the notion that physical reality comes to us in a digital fashion via discreet amounts of information feeding our physical senses. A very simple visual model depicting physical information is given below. This model is believed to provide a very important clue to how nature packs away information in a physical manner utilizing reflected light. This light provides a wealth of past information regarding any physical object in question. In this model, classical information appears in the form of nested optical images (see Figure #1 below). The model is then scaled in physical size while keeping the basic physical concepts of *embedded images constituting physical information* intact. What results is a physical model of information that contains the means to identify information in a manner that reads like a book, with each page being written at a precise time. In order to appropriate the means to describe such a book of information, a mathematical structure that could serve to model such information is identified. The analytic space of Riemann Zeta is believed to provide such a mathematical form. Using Zeta, a space like plane in the center of the critical strip can be constructed to contain two axes having Zeta’s non-trivial zeros and will be identified as a scalable “image space” that can be used to mathematically represent information we extract from our universe (see Figure #2 below). This “image space” is akin to a place where ALL information exists in the form of electromagnetic images and is believed to provide a mathematical representation for the *physical* center of human consciousness. This concept places human physical consciousness at both a physically and mathematically definable place in space and time. This implies Zeta’s analytic space is a space that mathematically describes how living, conscious creatures physically couple with the universe in order to exchange information. Basically, holomorphic functions provide the basic mathematical tools to represent all forms of information that physically drive our physical senses, and Riemann Zeta is *all about* holomorphic functions. These functional forms are believed capable of supplying the mathematical representations of human physical interaction with the universe surrounding them and this leads to discovering new information that continually alters our conscious perceptions of reality (the string landscape). Information in the form of discreet image trails transcending in time are believed to provide our consciousness with physical information. Life’s physical connection to the universe is presumed to reside at a precise location, bordered by reflective surfaces and we as individuals are believed to exist in a planar region at the geometric center of these surfaces. This implies that our physical consciousness is physically *centralized and plugged in* directly to the most elementary theory of information, which is to be expected given how we knowingly *interact with* and *change* every physical measure of information that we make.

That stated above implies that all the information that feeds human consciousness resides at a mathematically definable location that is precisely “half the distance” between two reflective surfaces. One spatially *contracting* surface will be identified as the quantum mechanical reflective surface (anti-deSitter like space) and the second; a spatially *expanding* reflective surface will be identified as the outer spatial edge of our universe (deSitter like space). Our physical consciousness is assumed to occupy a location in space *exactly* halfway between these reflective boundaries in the same fashion as the common electron-positron annihilation coordinate event lies between the oppositely travelling gamma rays of light. At this half space location Riemann Zeta is believed to mathematically appropriate for all the information we gather with our five

physical senses which implies we can attain information regarding any macro or micro ensemble of quantum states for any and all real physical systems, and, our consciousness can only measure information from this restricted location. Zeta space is believed to provide the mathematical tools to completely describe all the physical information we gather from any quantum field, and, this information in its most discreet form is believed to consist of time dependent spatial images, in a physically self similar fashion as that shown in Figure#1 below. Each term in Zeta's infinite sum is akin to a distinct image that supplies information that is discreet. This information is also finite in content when used to describe past events of any real, classical, physical system.

Physics is the art of measuring and manipulating information regarding our *testable* physical reality and this information presents itself to us via our five individual physical senses. Human physiology meshes physical discontinuities into what appears to us as a rather continuous existence as we move through space and time. To better approach questions regarding classical reality, we must first attempt to define classical information and logically correlate this information to information connected to both the large and small scale structure of our universe. All information is physically connected, implying, all information leads back in time to a creation event. Quantum mechanically speaking, if everything shares a common event, everything stays connected forever. If the smallest components of information can be counted and found finite in information content, this implies our conscious reality is composed of a finite amount of information (however enormous in total amount it may be), globally and locally built bit by bit, in the same fashion as individual bricks build a physical structure, or similarly, how individual cells build living creatures. We must first derive a model maximizing the physical information obtained in our conscious reality given to us by our five physical senses, **all** of which are electromagnetic in their root physical coupling to the universe we share. Consider the following model pertaining to visual, classical information:



**Figure#1:** Albert, a Cube and Two Clocks Placed Between Two Large Parallel Mirrors

The above image (akin to a universal cover space) was taken with a camera that resides *just outside* of the space contained between two large mirrors. Surely we all have observed this type of *multiple reflection* phenomena sometime in our lives. What is physically being observed in the above image are successive reflected image *pairs* that are nested, and, contain a wealth of information proceeding backward in Albert's proper time. Albert's past physical actions can be obtained by measuring physical attributes within these embedded images. Each image has a distinct size (formed by a spatial scaling) and a measurable time delay from Albert's present time. The time delay for each image depends on the numerous reflected light paths *total length* traveled to create each image. Images are concentric with a common image center and become smaller in size (and also recede further backward in time) as this common image center is approached in the mirror plane. One type of image within the image pair (white bordered mirror w/ square clock) represents a frontal image of Albert's space while the other image type (the black bordered mirror w/ round clock) is an image of Albert from behind. Each image represents a precise "time difference" relative to Albert's present time  $T_n$ . Also, note that adjacent image pairs have analog clocks that rotate in an *opposite* sense relative to one another as we move through these multiple images that step backward in time. The clocks motion is very reminiscent of the circular polarization of light which implies that information regarding photons of light (phase) acts as a self similar system. Classical information from each reflected image is contained within a common radius centered about a point within the smallest images central region. Albert does not see these multiple, past time, images of himself because his vision resides in the line of sight between the mirrors, therefore, his physical opaque presence blocks his view of the nested image pairs that yield his past information. Albert observes only a single image of his face in the white bordered mirror, but, the camera image that resides *just outside the box* (ie., Figure #1 above) tells a very *space time* dependent information story. The time interval  $\Delta t$  in Figure#1 represents the time it takes light to travel between the two mirrors. While this time interval  $\Delta t$  is very small indeed for the physical conditions given in the above figure, we can still measure these time ordered, nested in space, optical images for obtaining information regarding Albert's past physical doings. Imagine placing two more mirror pairs around Albert with each axis pair having an "out of the box" camera view such that Albert is now bordered by six mirrors (three mirror pairs, one pair for each spatial dimension, back/front, left/right, top/bottom). These *outside the box* camera images from the three mirror pairs can be analyzed to build a complete enclosure of *time dependent surfaces of information* regarding Albert, and, each surface is located at a finite amount of proper time from Albert's present time. Information measured from the sum of the six camera images place Albert in a three dimensional space bordered by images that are being created in a reflective manner. Basically, Albert's past information appears in "time dependent compressed states" in the form of embedded images appearing on the surfaces of the reflective mirrors. If we contemplate all the optical information we can collect in the camera snapshots regarding our measurement and analysis of Albert, we realize that by utilizing cameras sensitive to many different wavelengths of light, we could monitor things like Albert's temperature through time (infrared images) and bone density through time (X-ray absorption images – state of osteoporosis), along with many other physical details regarding Albert and his relative motions in the space enclosed between the mirrors. We can even monitor past sounds that Albert makes by knowing that the sound waves between the mirrors will have a measurable impact on various parts of the reflected image spectrums within the mirror walled enclosure. Albert's physical being creates historical information that can be read from the nested, reflected images Albert leaves behind at the speed of light. Consider Albert's brain waves that exit his skull. Measurements we make from the embedded

images in the mirrors would allow us to measure Albert's electrical motor neuron signals further back in proper time relative to when Albert's physical body motions occur. The *outside the box* observer collecting and measuring information in "the present time  $T_n$ " can measure Albert's past information to reveal Albert's past thoughts and see how these thoughts transpired into future actions. Therefore, a wealth of information regarding Albert can be obtained to precisely and accurately predict classical information regarding Albert's next physical motions and thoughts at a time  $T_n + \Delta t$ . This model of classical information represents the ultimate with respect to the phrase: "big brother is watching, measuring and recording." Therefore, "*outside the box*" implies we need to step just a bit outside our spatial enclosure to measure time dependent information contained in the form of embedded images formed on bordering reflective surfaces. Reflective borders create an embedded image surface containing information. In three dimensions, this looks similar to the many layers of an onion. Images on the mirror represent time dependent information in its most root form ... as a series of two dimensional image pairs that contain information regarding opposing directional views of Albert, and, each image element of the pair has an analog clock rotating in the opposite sense relative to each other.

When considering much of life's pre-recorded history, we see *archeological* surfaces that provide a measure of time dependent information regarding civilizations (this amounts to a surface layer of information embedded within the Earth), *petroglyphs* etched into the surfaces of rocks, *labels* placed on surfaces of store bought goods, the surface of a *page* in a book, surface of a computer *hard drive*., etc. It appears that life has progressed by using physical surfaces as the parchment of choice for recording information. Figure #1 above may very well provide the most elementary root physical reasoning of why time dependent information resides on surfaces. When we extend the basic concept of Figure#1, *multiple reflections from a reflective surface spatial boundary contain measureable past information*, we find this *self similar* to the fact that all information regarding every event occurring within a black hole is encoded in finite units of area on the black holes surface.

Can we logically connect the information contained within the images shown above to information contained on the surface of the black hole? This question may sound weird, but, a physical path that flawlessly carries all of Albert's historical information, without losing a smidgen, is *guaranteed* to exist. The Holographic Principle of string theory gives us the physical right to make this connection, therefore, it is up to us to connect the dots (and possibly the dashes) that physically couple the nested images shown above to the information on the surface of a black hole. We would also be capable of tracking Albert's information image trail to a time when Albert's consciousness began. In fact, this same basic concept is believed to be capable of tracking classical information back to the beginning of time itself, in a logical, physically consistent, information conservative manner.

At this point the critic in us all will dispute the fact that useable amounts Albert's past information can be accumulated in the form of images on the surface of reflective mirrors. Objections would include things like: "The spectrally dependent absorption of a real mirror would not allow this optical information to exist very long in past time via a continual trail of reflected images," etc. If you believe that the Holographic Principal is correct, then, you must maintain the notion that NONE of Albert's past classical information is ever lost. When we look again at the figure above, we have to think a bit deeper into the physical details regarding the reflecting mirror surface, and, what physically occurs within the mirror surface that allows these classical sized nested optical images to form. Electrons are the minute elements within the mirrors that physically maintain these optical reflections, therefore, if we consider the "electron" as the most discreet reflective element that is physically controlling Albert's reflected images then

the perceived “information loss” is not information loss at all. Albert’s images containing measurable information are diverted and placed in the nested image spaces associated with electrons, a self similar reflective system to the large mirrors, but, much smaller and much more dynamic. The electronic embedded image spaces provide extra degrees of freedom to encode classical information. Albert’s time dependent, past information will forever be stored in the form of embedded images and will run through the physical gamut of the tiny, reflective embedded image spaces of the electronic mirror as time passes. Albert’s classical information is merely being encoded in a more discreet space of images and locked away in both space and time. This implies that a nested image space is associated with the electronic resonances within the mirror surface states and these are physically coupled to the reflection space of Albert. Dividing up Albert’s information in a microscopic fashion drives the Kramer Kronig engine and is quite an exact physical process to which no information is lost. Information is diverted into the  $i$  plane ( $i$  plane being the electronic reflective plane containing embedded images) of the subsequent electronic quantum modes within the classical mirror. As Albert’s classical information reflects between the large mirrors, light continually moves to occupy the electronic mirror states in a self similar fashion. This implies that information associated with Albert is being physically assigned to reside in very precisely numbered quantum states. Albert’s information is being written within the microscopic Hilbert states in the form of nested images within the electron mirror surfaces and in a self similar, nested image fashion as our large mirrors shown above. The electron serves to provide the reflective borders to a spatial volume that contains nested images that continue to harbor all of Albert’s past classical information! Therefore, as we track Albert’s information further and further back in time, information contained in our classical mirrors in Figure#1 above is being moved from the large, classically coherent macroscopic images to the microscopic images that become spectrally (time sequenced) decomposed and placed in the available reflective Hilbert states of the electron. What is deemed as Albert’s measurable classical information, the nested past images, is again being sliced and diced and stored in time in the form of embedded images in the quantum space regime. The large mirror image space in Figure #1 above consists of the standard Cartesian axis makeup. When looking just “outside the box” at the nested image space of the rapidly moving electronic mirror we now need to consider how to extract the nested image information from these rapidly moving electronic mirror reflective borders. The question now arises as to exactly what kind of physical structure the reflective spaces of electrons could provide to store all of Albert’s information contained in the nested images. The answer to this would have to appear to the *outside the box* observer to have a very precise mathematical makeup given that no information is ever lost. When imagining one’s self at rest relative to the electron, and observing it from just *outside the box*, what information would we gather?” If we can mathematically represent these correlated (correlated to the classical information) nested electromagnetic electronic images, we would see within this model how classical information is being written into quantum bits, and, how these bits can be measured by modeling the *outside the box* view that illuminates this quantum mechanical space that connects information back to Albert’s present space without the loss of information. The *outside the box* view of the electronic mirror provides a visual S matrix, ie., the physical transfer of information between physical systems, that allows information to appear in a *outside the box* fashion. Human memory may physically represent this very same process.

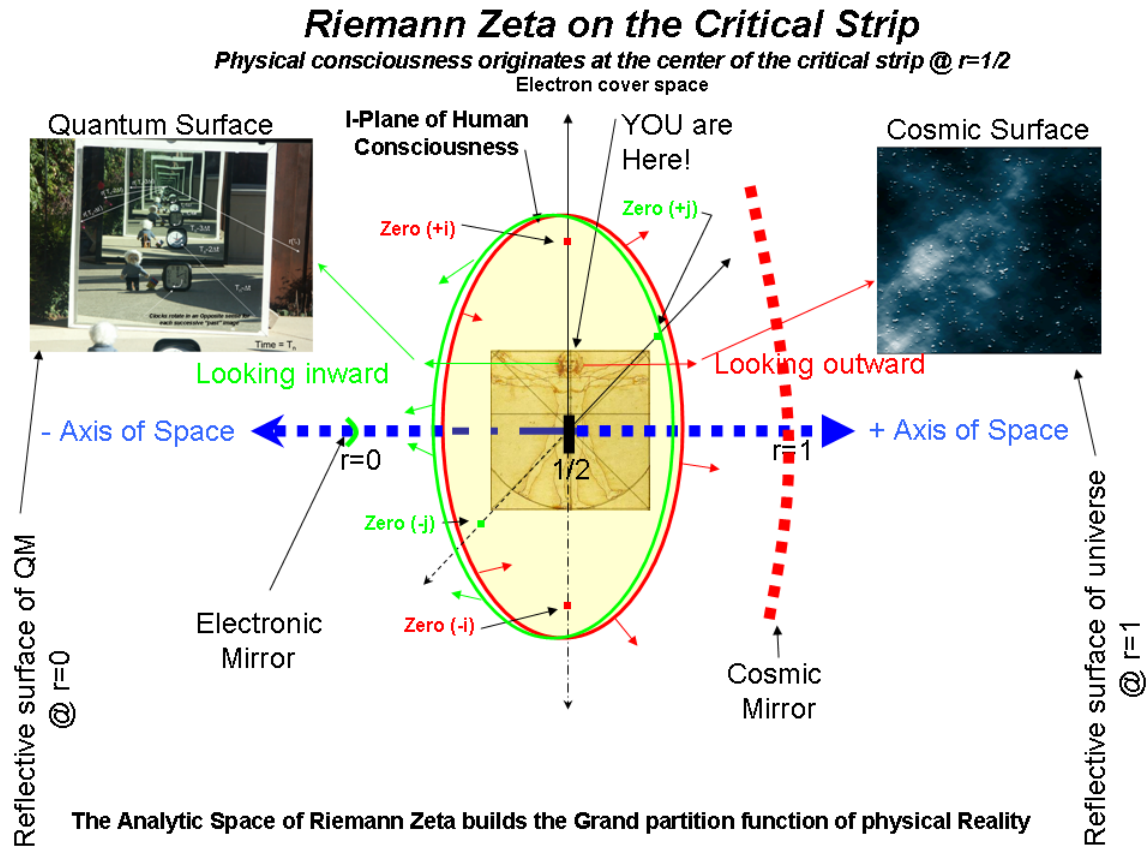
Albert’s classical information is assumed to be stored away in the reflective space of quantum mechanics as Albert’s proper time passes. It is not because information is being lost in the images above that we can only look at Albert’s information in small, but finite, periodic times in the past. Albert’s classical past information is being encoded into the Hilbert spaces generated by electrons (a very tiny, quickly moving mirror). This

implies Hilbert space is similar to the large mirror reflection space in all informational respects, and therefore, contains a past time continuation of Albert's image trail that continues to *string* information through time continuously encoding the coherent classical image surfaces embedded within one another. Each electronic resonance frequency within the large mirror surface represents a precise location in "inverse time" in the same manner as information in white light is composed of different colors (also different *inverse times*), so too is classical information stored quantum mechanically in embedded "finite inverse time" image packets. Once stored in quantum states, classical information continues in time to become stored within other reflective image surfaces in a diffusive manner and is physically coupled to Albert's entire surroundings, encoding Albert's past classical information into many distinct quantum mechanical modes for Albert's entire life. This process is also self similar to how a spatial measure can be Fourier transformed to a measure of inverse time. Therefore, classical information is presumed connected to quantum information by being actively written in the form of embedded reflected images and this physical action is believed to drive the second law of thermodynamics. The propagation and storage of classical information into reflective microstates constitute entropy increase, but, not information loss. This implies that if we maintain the belief that no information is ever lost, we allow all the conservation laws in physics to hold for this classical, nested image information surface as it locks itself away into an exact arrangement of quantum states extended through time. If we were to take the physical entities above, Albert and his encapsulating mirrors and surroundings, and throw them together into a black hole, all of the embedded image information regarding Albert's entire existence will appear encoded on the black hole surface. Again, this implies that none of Albert's information is ever lost. The question is "how do we reveal the quantum information that represents an equivalent amount of classical information "other" than by throwing Albert into a black hole?" Because the cosmic expansion of space produces more available, but not immediately filled, quantum states within our cosmic box, this implies that Albert's classical information is continually being given newly available quantum states as time passes which is again in parlance with the second law of thermodynamics (space is increasing and so does the total phase space providing quantum states), implying that classical information is being actively given more quantum mechanical storage space (states) as time progresses.

Therefore, what is being stated above implies that there is a continuous process where Albert's classical information is being stored in proper time in a quantum mechanical fashion, and, information regarding every physical aspect of space is encoded into the bordering mirrored surfaces in both a macro and a micro sense. The quantum degrees of freedom serve as nature's classical information recorder, and, as we find new ways to look *out of the box* we can reveal all the classical information stored throughout the ages. Also, by focusing this discussion only on the images constituting embedded, measurable information, we don't have to ask the question: "What *physically* constitutes the mirror?" Here, we only contemplate the information contained within the reflected images on the surface. It may just be that we can define the electronic mirror itself as being defined by the sum of all these time dependent embedded images residing on its surface (each image contains photon energy, and,  $E=mc^2$ ). This would be akin to defining a book by its written information content and not by the parchment it is written on. The electron's mass may be equated to representing "the sum of all embedded images" that reflect from the electrons planar surface. If this was so, what type of camera can we use to look at the *out of the box* image of the electron?

Having a mathematical representation of this *out of the box* electronic mirror view can serve the purpose for obtaining and manipulating quantum information to build classical information. If we step just *outside the box* of the electronic mirror, how could we analyze time dependent information in the same fashion as Albert's camera image?

The answer to this is believed to be encoded in the analytic space supplied by the Riemann Zeta function, implying that various forms of Zeta space may very well serve as the *outside the box* views of information contained within the reflective plane of the electronic mirror. (Much speculation here!) See Figure #2 below. Zeta is believed capable of defining the ensemble of micro states used to store classical information. It is these microstates that are utilized to build quantum field theories. Zeta space is believed capable of connecting all the embedded image trails of information that seamlessly (analytically) connect classical information from the beginning of time back to the surface of the black hole, and this obviously includes all information pertaining to Albert.



**Figure #2:** Analytic Space of Riemann Zeta

## CONCLUSION

A simple classical *outside the box* model of time dependent, measurable information has been presented. This model was extended to an *outside the box* quantum regime keeping the basic physical constituents that yield information intact, embedded electromagnetic images. The mathematical structure of Riemann Zeta has been speculated to provide the measurable image space of the *outside the box* electron view of reality. This function has been hinted at providing a mathematical model that can be utilized to quantum mechanically define the physical center of human consciousness.

Could it be that each individual string *type* that constitutes “string-theory” mathematically represents a physical path of information that is utilized by a specific human physical sense, and, the “M” in “M-theory” stands for “Mirrors with Me in the Middle?” If this is so, classical reality is both digital and grandiose when viewed from outside the reflective box.