

# Is a Different Search Protocol Required for Success in SETI Research?

Richard L Amoroso<sup>1</sup> & Elizabeth A Rauscher  
<sup>1</sup>amoroso@noeticadvancedstudies.us

In an Anthropic Multiverse intelligent civilizations are purported to be the rule rather than the statistical exception, providing circumstantial evidence that the current SETI search protocol to find civilizations similar to our own is inadequate since the SETI program is over fifty years old. From the current cosmological perspective researchers are content to perform straight forward searches for narrow-band electromagnetic transmissions from technologically based extra-solar civilizations. Here it is suggested that the scenario in an Anthropic Multiverse requires a radical new observational approach.

## 1. On the Horns of a Dilemma

If the physicality of the universe is not a Big Bang cosmology following a Friedmann-Robertson-Walker (FRW) metrical solution to Einstein's gravitational field equations as the current vogue suggests; it could have a radically different basis with an anthropic principle guiding its temporal evolution as we've done our best to delineate in this volume. In this context we explore the possibility that the Search for Extraterrestrial Intelligence (SETI) which formally began in 1959 (originally called the Order of the Dolphin) will require a radically different search protocol in order to have any hope of achieving success.

The highly ordered symmetry conditions of anthropic multiverse cosmology suggest that conformal scale-invariance is an inherent property. This could mean that "other worlds" exhibit the property of the 1<sup>st</sup> person 3<sup>rd</sup> person barrier. This conjecture suggests that the current SETI strategy will fail because current search protocols are based on Big Bang naturalism in the context of the Copenhagen interpretation of quantum theory which is governed by the uncertainty principle (The observer can only view one complement of an observation at a time because of the Pauli exclusion principle). This exclusive property according to the principle of invariance would apply to both other minds and other worlds. The current cosmological perspective does not include any putatively required addressable anthropic parameters of 'consciousness' relative to the physics of an observer. To repeat in order to ameliorate any surprise: What is suggested is that other worlds have properties similar to 'other minds' relative to an Earth observer which keeps conscious content blocked or hidden from detection by the limit of 4D Minkowski space based instrumentation by the quantum uncertainty principle. Why anthropic properties are required is explored. An outline for implementation of an alternative strategy based on new cosmological principles inherent in unitary field parameters as represented in a Holographic Anthropic Multiverse (HAM) is delineated. Design for an inter-dimensional radio Q-telescope utilizing entanglement with an HD 'ontological wave function of the universe' that HAM cosmology might require is presented in a preliminary manner.

Sometimes scientific enquiry follows lines of inductive reasoning just to explore the spurious conclusions. This chapter is a logical extension of anthropic multiverse parameters in penultimate form; if it's SETI speculation is wrong it remains an interesting diversion to follow the curious thread of logical deductions. If it turns out correct then we are prophets dreaming of the day we can watch

*Bronson Beta* TV or listen to *Ethnarch Gamma* radio! We cross the line of usual conservatism in order to leave no stone unturned, especially as SETI researchers have stated that under the current methodology it will probably take several generations to achieve success. With the pace of improving technology this would only take about two generations to check every star in the Milky Way Galaxy.

The first episode of *I Love Lucy* was broadcast on October 15, 1951. About 0.0002 seconds later, the signal glided over the rooftops of the farthest city suburbs, and headed into space. It's still going. Every day, that first installment passes through an additional 4 thousand trillion trillion cubic kilometers of the cosmos. Given that stars in our galactic neighborhood are separated by about 4 light-years, it's easy to figure that roughly 10-thousand star systems have been exposed to "I Love Lucy" in the past five decades [1].

When first researching this work the ideas seemed outrageous even to us; we suspect this may initially be the case for you also dear reader. The endeavor was initially conducted more as a recreational exercise to see what tinkering provided rather than as a serious avenue of scientific inquiry. We still remain a bit dumbfounded at the final result but have learned to embrace it in view of the broad explanatory power of other aspects of the new paradigm. Readers will find this by far the most unusual chapter in the volume. We do not wish to belittle it by our sarcasm or by passing it off as errant twaddle; but we want to make it clear we realize the challenges it presents within the currently popular Big Bang mindset and wish to state this obvious fact. Finally this chapter is a radical blend of theoretical anthropic cosmology, philosophy of science and epistemological theology. We hope you will enjoy at least the exercise of trying to keep an open mind as we have done; which is after all supposed to be the guiding light of scientific inquiry!

## 2. SETI Epistemology from the Anthropic Perspective

Currently two standard techniques are utilized in the search for extra-solar planets. So far most planets have been discovered by observing tiny wobbles in a stars radial velocity due to the gravitational tug of an orbiting planet. This method favors the detection of very massive Jupiter class planets. The other technique, called the *transit method*, observes the slight dimming in a stars light when a planet passes over its disk. Technological improvements in the sensitivity of digital cameras and spectrometers continue to enhance both techniques significantly.

It seems reasonable to assume that if extraterrestrial intelligence exists at a technological level sufficient to broadcast radio signals into space, an Earth based search could be conducted by searching the sky with radio telescopes of sufficient sensitivity. This appears inherently obvious from the perspective of a naturalistic Big Bang cosmology. But by 2050 the SETI program will be considered a failure if negative results remain; proponents have stated this search protocol would then have to be rethought.

Is the situation different in an anthropic cosmology? If it is, thinking metaphorically as queried above, aiming a radio antenna at the sky may be no different than aiming a microscope or telescope at someone's head in order to read the content of their mind. This is another epistemological conundrum. Cognitive psychologists who currently consider the brain tantamount to mind contend that forthcoming improvements in f-MRI brain scans will be able to resolve consciousness. Therefore an f-MRI enhanced radio telescope should be sufficient to resolve a signal. We have addressed this issue in detail elsewhere [2-6]. The suggestion explored here is that from the anthropic multiverse perspective SETI protocols must consider an additional parameter for resolving the signal because 'other world' will be caught under the 'other minds' 1<sup>st</sup> person 3<sup>rd</sup> person barrier that entails causal and therefore information separation. This is a stretch even for us to accept; future empirical tests will resolve the issue. Quantum theory discovered the nonlocal Einstein, Podolsky, Rosen (EPR) correlation. A completed form of quantum theory with an HD SUSY form of EPR entanglement that can be used to design a radical new type of inter-dimensional Q-telescope for manipulating and accessing causally separated anthropic

domains. This relates to the nature of the observer, a challenge considered distasteful and therefore ignored so far in physical theory and epistemology in general [2].

Before delving into this thesis, we wish to discuss some additional epistemological considerations. Theoretical physicist P. Rowlands states in volume 41 of the series on “Knots and Everything”,

Physics appears to be the only source of fundamental knowledge about the natural world. No other system of thought has shown any of its systematic explanatory or predictive power [7].

The tools of physical science have been the pragmatic use of logic, reductionism and empiricism. But this can now be considered a myopic view because currently physics is devoid of underlying principles of ‘consciousness’ associated with not just the role, but also the fundamental nature of the observer. We have ignored the fact that the observer is imbedded in and made out of the same materials as the instrumentation. We have postulated that perceived reality itself is an intermediate collapsed or limited state. The time has come to intricately inspect the bias any inherent limitations the virtual nature of the observers reality intrudes on the pragmatic foundations of empiricism. This means to complete epistemology the tools associated with transcendence must be included. Recall that thousands of years ago Greek philosopher Plato stated that ‘no matter how great ones intelligence, or how great ones wisdom, noetic insight (transcendent) from the cosmos is still greater’ [8]. We are suggesting that in order to complete the tools of epistemology, transcendence or at least the role of anthropic properties should be utilized as a tool in guiding scientific theory formation [2].

In contrast to the methods of scientific inquiry, theology also attempts to describe the nature of reality utilizing faith and revelation or transcendence. Scientific inquiry by definition should not discount one any more quickly than the other. Myopic scientific interpretation has historically made as many horrendous mistakes as rigid bias in theology. We suggest that Theology and Science are not mutually exclusive as they became around the time of Galileo because of both the failure of sound logic as in the case of gravity for different weight objects and the narrow mindedness of the contemporary ruling theocracy, but opposite ends of a long continuum of human epistemology. We are not suggesting theology should replace science or that the empirical stance should be weakened in any way, only that theology and transcendence can be used as a viable tool to temper scientific theory formation and interpretation in some form of ‘empirical metaphysics’ [2,9]. Case in point, the principles introduced here could have been utilized in the year 2,000 rather than after the proposed 2,050 change in the SETI protocol, for a possible savings of many thousands of man hours and many millions of dollars. Not to mention that some future generation instead of our generation gets to enjoy the wonders of extrasolar intelligence.

SETI researchers have suggested three possible reasons for the failure:

- 1) Technical intelligence is very rare,
- 2) Technical societies are short lived,
- 3) Failure occurred because the correct search strategy is not utilized. (The one we address here)

We use this chapter as an axiomatic test case for future hindsight into the viability of an ‘empirical metaphysics’ [2,9] in evaluating the utility of the putative integration of science and theology, but not to return to the bias shown in the following quotation:

*For the first time since the Dark Ages," physicists Paul Ginsparg and Sheldon L. Glashow wrote 12 years ago, "we can see how our noble search may end, with faith replacing science once again [10].*

### 3. The Drake Equation

The Drake Equation [11-13], first formulated by radio astronomer Frank Drake in 1961 purports to estimate the number of communicative civilizations in the Milky Way Galaxy. Drake's initial solution

to the Drake Equation estimates 10,000 communicative civilizations in our galaxy of about 250 to 400 billion stars. But Drake's equation is based on various assumptions. If different values to the assumptions are utilized intelligence can just as readily be suggested to be the general rule not the statistical exception. At the time of writing about 10,000 extra-solar planets have been discovered; most of which are Jupiter size found by the minute stellar wobble their gravitational mass creates on the star [14]. But on 7 March 2009 NASA launched the Kepler extrasolar planet finder which will search the Milkyway for Earth-size planets utilizing the transit method. Kepler's photomultiplier sensitivity allows searches for Earth-size planets around stars up to 3,000 light years distance.

The Drake Equation:

$$N = R^* f_p n_e f_l f_i f_c L, \quad (1)$$

Where

- $N$  = The number of communicative civilizations
- $R^*$  = The rate of formation of suitable stars (such as our Sun)
- $f_p$  = Fraction of those stars with planets. (Current evidence indicates planetary systems may be common for stars like the Sun.)
- $n_e$  = The number of Earth-like worlds per planetary system
- $f_l$  = The fraction of those Earth-like planets where life actually develops
- $f_i$  = The fraction of life sites where intelligence develops
- $f_c$  = The fraction of communicative planets (those on which electromagnetic communications technology develops)
- $L$  = The "lifetime" of communicating civilizations

Using one of the interactive sites in [12,13] one may experiment with the parameters of the Drake equation to explore the range of possibilities.

Following the principle that life is the rule in an anthropic cosmology we propose corollary §1

#### §1 All Stars Have an Anthropic Zone.

Every star has an anthropic zone associated with it. Since 'gravity is caused by the movement of spirit' [15] or the unitary field if you prefer; the anthropic action principle optimizes the formation of planets compatible with life in this region; but of course this doesn't necessarily mean a star has planets in this zone.

#### 4. Brief Review of Anthropic Multiverse Parameters

As gleaned from the introductory chapters in Part-1, HAM cosmology is not a naturalistic Big Bang cosmology but a form of continuous-state eternal/atemporal timeless multiverse derived by extending Einstein's original static universe model [16] to include HD SUSY parameters. HAM cosmology has properties reminiscent of Kant's antinomy of spacetime which he proposed as a solution to the argument between Newton and Leibniz as to whether the universe was open or closed [17]. A fundamental HAM premise is that the observed Hubble radius,  $H_R$  the Einstein 3-sphere of our perceptual reality is closed and finite temporally; and open and infinite atemporally. Thus the topology of HAM cosmology is like a continuously transforming HD hyper-Klein bottle with the possibility for an infinite number of Hubble type spheres 'holographically' nested within it, each of which might have a fine-tuned variance of the laws of physics [18]. The paradigm was developed by extending the Wheeler-Feynman-Cramer radiation/transactional interp-retation models [19,20] and the de Broglie-Bohm ontological models to an HD regime commensurate with our version of SUSY-M-Theory parameters [2-6], but not interpreting Everett's many worlds condition as a duplicate parallelism but as additional and unique in their own right.

For Kant there are four antinomies connected with

1. the limitation of the universe in respect of space and time,
2. the theory that the whole consists of indivisible atoms (whereas, in fact, none such exist),
3. the problem of freedom in relation to universal causality
4. the existence of a necessary being

all of which by pure reason contradict the empirical, as thesis and antithesis. This was part of Kant's critical program of determining limits to science and philosophical inquiry [17].

The inherent purpose of an Anthropic Multiverse is the evolution of life and consciousness, therefore intelligent life is the rule not the accidental exception as often considered by Big Bang cosmologists. The difference in evolution for an Anthropic Multiverse is that evolution is not random but guided by a teleological action principle. A major premise of HAM cosmology in this respect is that cosmology is a self-organized complex system. Such systems are driven by an external action principle which in this case is the anthropic teleology. This action of course applies to each nested Hubble sphere. Thus the horizon of knowledge moves outside the temporal bounds of  $H_R$  where theory is still silent about other aspects of the Multiiverse; but since the model is empirically testable we hope to soon begin to unravel new mysteries.

The difference in the two scenarios demands radically different search protocols for detecting extra-solar intelligence.

## 5. Does SETI Require A Different Strategy for Success?

Even if an EPR<sup>1</sup> correlation were somehow employed; under current methodologies EPR superposition is unable to teleport detailed information from one domain to the other. The EPR condition only arises under the simultaneous emission of photons (photon pairs) which as a result are correlated in time. It is suggested that neither people or planets naturally maintain such a correlation and the current interpretation of quantum theory is not sufficient to develop such a superposition from causally separated entities by any known method of parametric conversion. The EPR paradox therefore illustrates both why a Big Bang SETI strategy will fail and as will be illustrated below leads to the explanation of why a HAM SETI strategy holds more promise.

This anthropic condition for SETI is an issue of both philosophy of science and theology. For example although cognitive brain scientists remain hopeful, the myriad forms of brain scan technology cannot achieve the analogous result of resolving consciousness. Even utilizing the highly anticipated new MRI or fMRI advances will fail because 'mental information' is not contained in the energetic atomic or molecular states of brain neural biochemistry. Consciousness is not only a brain state, but a teleological cosmological condition [2-6]. For the purposes here, the proper criteria for a successful SETI program must be aligned with a Cartesian dualistic model of mind-body interactionism [2].

This is the historical debate over the sufficiency of *Biological Mechanism*<sup>2</sup> versus the need for an additional life principle [2,9]. At the moment this issue remains highly controversial and many would insist that the 'telescope/microscope' metaphor applies neither to the cosmological issues pertaining to SETI research nor especially not to information content in the brain/mind. The critique revolves around the philosophical issue of Biological Mechanism. To insist at the present level of scientific progress that the mechanistic model of mind or the Big Bang cosmology is incorrect is highly unpopular.

<sup>1</sup> EPR – From a thought experiment devised by Einstein, Podolsky and Rosen which later in relation to experimental tests proved the existence of 'quantum nonlocality', a condition of long range entanglement or superposition.

<sup>2</sup> Biological Mechanism – The philosophical position that the principles of Chemistry and Physics are sufficient to describe all life; no additional life principle is required.

Unfortunately, at this moment nearly every scientist or SETI researcher would therefore summarily label the premises given here as nonsense, believing that solar systems or planets are nothing like brains; and to even consider such a claim would be absurd. No current standard model of science (of which there are up to a dozen depending on how one counts them) can predict this conundrum because they remain naturalistic and the problems addressed here therefore outside this scope of influence.

In HAM cosmology the Hubble radius is an observational limit based on a ‘tired light’ redshift [21-31] rather than a Doppler redshift. Hubble discovered redshift not expansion of the universe. With the alternative interpretation the Universe is not limited merely to the ~15 billion light year radius Hubble sphere of the Big Bang model that we observe. The Multiverse has the potential for an infinite number of holographically nested Hubble-type spheres in causal separation each with their own laws of physics [18].

Here is where the conceptual problem arises for SETI as it is currently employed. In a Conscious or anthropic universe it appears that each intelligent system (by this we mean planetary system with intelligent life) has its own natural laws that are out of phase with the cosmological conditions of other intelligent systems (The same might be said for people) making oscillations of the background matter, not the mental content (like the quantum fluctuations of brain chemistry explored by fMRI) the only material viewed. So the discussion here is centered on the problem of how to get at the ‘Qualia’ or endogenous ‘conscious light’ of intelligence rather than just the thermodynamic energetics of the atomic structure of the rocks and gasses there.

## 6. Theological Arguments – Adam given his Reckoning versus the Cosmological age of the Earth

The putative age of the Earth based on scientific radiometric dating has an upper limit of about 4.567 billion years based on rock in the earths crust which is also compared to moon rock and Martian meteors. The best-known absolute dating technique is carbon-14 dating, which archaeologists prefer to use. However, the half-life of carbon-14 is only 5730 years, so the method cannot be used for materials older than about 70,000 years. Radiometric dating involves the use of isotope series, such as rubidium/strontium, thorium/lead, potassium/argon, argon/argon, or uranium/lead, all of which have very long half-lives, ranging from 0.7 to 48.6 billion years. Subtle differences in the relative proportions of the two isotopes can give good dates for rocks of any age. Radiometric dating is based on solidified rock. Should this be the valid origin of dating? It is purported that the Martian core took about .5 billion years to solidify. The Earth’s core has not solidified because of its larger mass. Thus extrapolating the age of the Earth as a molten ball before the crust solidified could also add a billion years to the age of the Earth, or do we not call the molten ball before crust solidification Earth? I make this analysis to contrast the scientific age of the Earth with the opposition to the ‘young earth’ theological doctrine with a different type of theological calculation making correspondence to the scientific model. Although not a rock hard theory it at least gives suggestive support to the Anthropic cosmology put forward here.

Theologically, after the creation delineated in the Book of Genesis of the Judeo-Christian Bible/Torah, Adam (the 1<sup>st</sup> man) was ‘given his reckoning’ in the Garden of Eden. This is interpreted to mean that instead of existing in God’s timeless eternal frame; Adam was given a different Earthly temporal clock or reckoning where “*A day with the Lord is a 1000 years with man*” [32] and a lifespan of “four score years”. HAM cosmology suggests that Adam’s ‘clock’ is relative only to Earth’s intelligence and therefore the fine tuning relative to Earthly laws of physics, so that both God and other cosmic civilizations are out of phase (and therefore invisible and causally separated) as it were with both the clock and geometric structure of our reality for the Earth observer.

It is possible to make a simple ‘age of the Earth’ calculation to illustrate this in contrast to the myopic view of the young-earth creationists who claim the Earth is only 7,000 years old by utilizing the Judeo-Christian premises:

- A day with the Lord is a 1000 years with man
- God created the world in seven days
- The creation occurred first spiritually and second temporally.

Therefore there is a modicum of credibility of doing a simple calculation using ‘Gods time’. Therefore  $7 \text{ days} \times 1,000 \text{ man years per day} = 7,000 \text{ years}$  which is the usual point of view taken for the period of man’s existence. But Adam was not given his reckoning until after he was placed on the Earth so instead if we consider the creation was 1,000 God years, multiplying  $365.4 \text{ Man days per year} \times 7000 \text{ God days} \times 1,000 = 2,557,800,000 \text{ billion Man years} \times 2$  because of the spiritual and temporal creations =  $5,115,600,000$  we come up with a proper order of magnitude for the scientific age of the Earth. Oh, you noticed the number appears to be a half billion years off. You forgot that the scientific reckoning date begins from the radio-dating time when rock solidified. It seems logical that it took half a billion years of cooling to solidify. We agree the calculation is somewhat silly and sloppy, but is it just a coincidence that it arrives at the correct answer of  $\sim 4.6$  billion years? [68].

Now let’s fudge in a different way. If we keep the spiritual creation as the 7,000 God years and reduce the temporal to 6,000 we get an age of the Earth of  $4,750,200,000$  billion years well within acceptable error for the putative radiometric dating method. But how can we justify this concatenation? Easy. We go back now to make correspondence to the ‘young Earthers’ in terms of Adam given his reckoning and interpret the omitted 1,000 years as the age of man for the fulfillment of a society of Gods people. Adam to Abraham to Moses to Christ to present age being the 6,000 years with the 7<sup>th</sup> to come as the Millennium. No offense if the reader wishes to call this ‘hogwash’. It has as much valid logic as any other consideration; and its purpose is only to be thought provoking and foster debate on the utility of some form of the anthropic principle in cosmology.

This has more pertinent meaning in terms of the first line of Genesis: “*In the beginning God created the Heaven and the Earth*” – Genesis 1:1. This is taken to mean God created this earth and its heaven. (A pocket universe in the Multiverse?) We realize that moot theological dogma is not considered scientific; but it can be used as a philosophical basis for developing a science of cosmology. Thus, in a Holographic Multiverse this implies room for an infinite number of nested Hubble spheres each with their own fine-tuned laws of physics [18].

Four Theological Arguments can be used to support failure of the current SETI search protocol.

1. Eternal HAM cosmology versus Temporal Big Bang Cosmology. In an anthropic universe a teleological action principle guides evolution. The argument is that even quantum theory is insufficient for success. A model utilizing the noetic unified field is required.
2. Genesis 1:1 states that God created<sup>3</sup> both ‘the Earth and its Heaven’ suggesting the laws of physics may be different for each civilization because the nested Hubble spheres are in causal separation requiring a different method for SETI.
3. Scripture also states that ‘Adam is given his reckoning’ preaching that Man’s time is not God’s time suggesting his time rate is different than that of other Hubble spheres (In a holographic anthropic multiverse a Hubble sphere represents the observational limit of a particular civilization).
4. Anthropic Principle (AP) arguments exist against Steady State cosmology. They suggest that ETI should have already filled a timeless universe and currently be in our solar system [33]. The argument is logical for a naturalistic Big Bang cosmology; but not for HAM cosmology. Earthlings are barely able to coexist with each other. By putative teleological considerations the organizer of intelligence may have a planets millennium (judgment day) begin before a civilization is able to use ‘warp drive’ space travel to visit other solar systems and interfere with their societies natural evolution. This argument may seem unacceptable to some but one is forced to admit that it is as logically valid as AP arguments against Steady State cosmology.

There is one scripture supporting this argument albeit from obscure Mormon theology:

---

<sup>3</sup> Not *ex nihilo* (out of nothing) creation, but ‘organized’ from existing raw materials.

*Is not the reckoning of God's time, angel's time, prophet's time, and man's time, according to the planet on which they reside? ... Yes. But there are no angels who minister to this earth but those who do belong or have belonged to it [34].*

This suggests that God will not allow external interference in the evolution of other planetary societies and could be a reason other stars are so many light years distant from ours.

## 7. Seemingly Far-Out Absurd Pseudo-Scientific Arguments

Now some very radical theoretical inference is introduced. The renowned physicist J.A. Wheeler proposed what he called the geon concept, a ball of photonic light of sufficient size to gravitationally self cohere into a sphere (not a star with matter, but a ball of pure light). The propagation of photons in the group would be in circular rays such that there would be no loss [35]. According to the special theory of relativity [36], in terms of the laws of conservation of energy and momentum, even though photons are considered to have zero rest mass; they have an equivalent *moving-mass*,  $m = E/c^2$  that is able to facilitate the cohesion of the Wheeler geon [35].

French physicist Louis de Broglie proposed that the same wave properties exhibited by electromagnetic phenomena applied also to all material particles [37-39]. Recall first that in dualistic models of consciousness the mind is like the light (rather than the usual electricity) running an optical computer. If the de Broglie wave of the Earth is considered to be like a Wheeler geon representing the light of all of Earth's intelligence over all time, then the mass of the Earth according to Einstein's formula for special relativity equating matter and energy  $E = mc^2$ , when converted to energy could represent the geon energy mass for all life on Earth over the approximately 5 billion years of its existence.

Our moment to moment view of reality is in time. This is like the centroid of a wave or internal spinning mass-particle moment of a propagating wave according to the standard concept of wave-particle duality. The envelope (wave) is timeless and the internal motion (particle) is temporal. Therefore, the total mass-energy of the wave can be used to theoretically represent the total mass-energy of planetary intelligence, which can be considered reminiscent of Jung's Collective Unconscious [40] which most transpersonal psychologists consider to be physically real.

The 14 billion light-year Hubble radius,  $H_R$  is the limit of observation. In Big Bang Cosmology this radius is said to be the current limit of expansion of the universe in terms of a Doppler redshift. In HAM cosmology the interpretation is different and based on a so-called 'tired light' mechanism. During the centroid moment of photon propagation the internal motion causes an inertial gravitational coupling to the spacetime vacuum. This coupling is responsible for the observed cosmological Redshift. This means that at the Hubble radius all visible light has attenuated to zero energy signifying the limit of observation. This 'mass of intelligence' would correlate with a classical 3(4)D gravitational force causing a perceptual collapse of the 11(12)D eternal space of HAM cosmology reducing it to the more limited temporal reality we observe as the external world. What I'm trying to say is that the photonic mass of the Earth's geon of intelligence provides a force collapsing observational space to the Hubble radius for the temporal based Earth observer which is a limited virtual reality.

Let me try to explain this more clearly. When an EPR experiment is performed, simultaneously produced photon pairs are required to provide the correlated system. These photons are propagating through space at the speed of light. Imagine instead a stationery system with an eternal present [41] as might be viewed by a HD observer from the point of view of Einstein's pre-relativistic thought of 'what it would be like to ride on a photon' – Time would stand still, i.e. one could circumnavigate the whole universe without the passage of time. In HAM cosmology both the multiverse and human beings contain an inherent duality of temporality and eternity. In this duality the invisible core is a 12D node of the unitary field from which our 3(4)D view continuously flows as a standing wave subspace.

The Pauli exclusion principle is illustrated in the uncertainty principle by the fact that components of the quantum wave function do not commute in the lesser Copenhagen regime. Correlated photon

pairs are produced by what is called parametric down conversion [42]; although theoretically described science currently has no method for parametric up conversion [43] to correlate unpaired photons. EPR superposition is the most primitive form of these correlations. The point I am trying to make is that a higher level unitary correlation is required to obtain ‘conscious’ information like through telepath or ‘revelation from God’. This information is scale invariant so that what I am trying to describe at the photonic and human level is also postulated to occur at the cosmological scale. All the information is contained in the hologram but by the 1<sup>st</sup> person 3<sup>rd</sup> person barrier macroscopic uncorrelated systems are not able to share internal information. This is a form of collapse of the wave function at the level of reality itself which our awareness is naturally coupled to.

This is a converse of the observational limit in physical cosmology where the ~14 billion light year radius of the Hubble sphere  $H_R$  is caused by light **redshifted to complete attenuation**. This relies on an alternative interpretation of Hubble’s 1940 discovery. Big Bangers interpret his discovery of the red shift as an indicator of expansion of the universe, when actually all he discovered is a redshift distance effect that can just as reasonably be interpreted to be non-Doppler as Doppler. In summary, the gravitational mass of Earthly intelligence over all time represents the force that gives the Hubble sphere its observed radius, i.e. in a conscious universe  $U_R$  is infinite, but the innate force of the observer creates in the continuous creation of his reality, the observational limit which for Earthlings is ~14 billion light years. This means that within another HAM Hubble type nested sphere elsewhere in the multiverse that mass of intelligence would be different, the laws of physics different by fine tuning and therefore the Hubble radius different for the denizens there! This is the crux of our premise for the failure of the current SETI protocol. These other intelligent domains would be ‘out of phase’ with our reality and therefore not observable with a standard telescope or microscope. This is considered a standard feature of wave mechanics. This is similar to making a quantum measurement; only a portion of the information is observable and only ontological versions propose methods for obtaining complete information beyond uncertainty. (See Chap. 9) This is part of an ongoing debate as to whether the Schrödinger wave function provides a complete description of reality.

Therefore, in this model the Barnard’s star geon of intelligence would have a radically different gravitational mass (statistically highly improbable that they would be the same; representing the highly improbable only case where the current SETI protocol could work<sup>4</sup>. It still would not work because this would be like an EPR experiment that cannot be used to teleport information) creating the Hubble type sphere created by the denizens living there. This would relate to the ‘reckoning’ given to the ‘Adam’ there, which must be taken into account for our reception of Alpha Centauri technological broadcasts according to the theoretical model presented here. There are several kinds of coordinate transformation, the Galilean transformation for small velocities, the Lorentz-Poincaré transformations for relativistic velocities and a newly proposed noetic transformation for ontological considerations.

## 8. The Anthropic Principle (AP)

The development of HAM cosmology aligns with arguments for the Anthropic Principle which states that the observed universe is designed to accommodate intelligent beings [44-46]. Fine tuning also seems to play an important part. For example:

- A star must remain on the main sequence for about 10 billion years in order for there to be sufficient time for planet formation and ‘guided’ evolution of intelligent life; which for Earth as an average case took about 4.5 billion years.
- If the Earth spins much faster the atmosphere will fly off.
- If the Earth spins much slower opposite sides will alternately burn and freeze.

---

<sup>4</sup> Because simultaneously created entangled EPR photon pairs would be required – this is why the Q-telescope postulated here is required to produce such a correlation.

- If the mass of the Earth is very large gravitational forces will be too strong to support life as we know it. The linear increase in body size and mass requires a quadratic increase in bone strength.
- If the Earth were too small (like Mars for example) the molten core would solidify, the dynamo would stop rotating attenuating the geomagnetic field causing the atmosphere to fly off into space since there would be no charge to trap the gasses.

It's interesting to speculate on possible environments of extrasolar planets. Living conditions would depend on the distance of a planet from a star and the stars spectral qualities. For a binary star system which is very common, if a dim massive red giant had a smaller bright star orbiting it, the red giant might be far enough away from a planet orbiting the smaller star to have little effect on it. If one assumed that the second star had a significant effect on the planet, it would probably result in the seasons being based on the proximity of the secondary star. Summer would occur while the planet was between the two stars, and daylight would be continuous. Winter would occur when the planet was on the far side of the primary star, and there would be the usual darkness at night. The habitable world of such a system would have a highly elliptical orbit that was much further away from the primary star during the summer because of the gravity of the secondary star. The elliptical orbit would regulate the annual temperature: the heat of two stars would be tolerable because the planet stays farther away from one of the heat sources [47].

In order for life to be the rule rather than the exception, these fine-tuned details unique to each star system would be far easier to meet with an anthropic action principle guiding planet and star formation. As seen in Chap. 10 soon enough we will have sufficient data for Titius-Bode profiles for the planets of numerous star systems.

The Weak Anthropic Principle (WAP) [33] asks where and when are good conditions for intelligent life realized. The Strong Anthropic Principle (SAP) extends the AP to explain the actual nature of physical constants. Some suggest that the SAP leads to teleology or belief in a 'Divine Purpose'. The SAP can be extended to apply to an ensemble of Hubble spheres in a multiverse with varied laws of physics for each Hubble-like domain. In this respect the SAP puts constraints on the physical laws of the universe.

Darwinian style evolutionary biologists argue that man is probably unique in the universe because of the number of improbable evolutionary steps required to produce a Homo Sapiens. There is also the space travel argument against ETI in our galaxy. If ETI existed in our galaxy, by the Principle of Mediocrity (Earth evolution being typical) [33], ETI would have evolved sufficiently to be in our solar system because within 300 million years they would have explored the whole galaxy. AP arguments against Steady-State cosmology, where time is meaningless, state that ETI would also fill the whole universe [33].

However, another plausible theological argument follows from anthropic teleology. After thousands of years of the evolution of human consciousness history remains continuously littered with the destruction of man getting along with man. One may make three reasonable assumptions by anthropic design.

- 1) Other stars are far away. Proxima Centauri, the closest known star to Earth is 4.2 light years away, requiring some form of advanced Star Trek style warp drive technology which for us is still science fiction.
- 2) In Judeo-Christian theology one might assume the prophesized millennium begins before a civilization develops warp drive capacity taking human intelligence off planet. (based on non-intervention and scripture)
- 3) Fully developed intelligence has no need for physical travel. A form of inter-dimensional superposition would be tantamount to providing an ontological presence invisible to us but not to them.

## 9. Calculations for a Holographic Anthropic Multiverse

We assume axiomatically from earlier work [18] that the universe is scale invariant from microcosm to macrocosm (i.e. no change in physical laws). But like most regimes there is a limit; because of fine-tuning parameters in the Multiverse, such a limit also applies to ‘our’ Hubble sphere. Also from prior work a formula for the noetic force of conscious-ness,  $F_N$  (an anthropic potential) [48] was derived as  $F_N = E/R$  in general unexpanded form, where  $E$  equals the energy of a conscious noetic field in Einstein’s (the physical unit defined as a mole of photons) and  $R$  represents a complex or rotational radius derived from momentum<sup>5</sup>. The formalism becomes complex when expanded and applied to a variety of SUSY domains in its range of application; for example  $E/R$  becomes alternating dynamic and static Casimir boundary conditions [49-51] in spacetime brane domains of continuous-state symmetry breaking. This noetic formula is utilized to perform a proportionality order of magnitude calculation to see if the mass of the universe,  $M_U$  calculated from the philosophy of standard physics can be considered commensurate to the alternative derivation of mass from the HAM model. The purpose of the calculation is to demonstrate the possibility that the collapse of the universe from the 11(12)-dimensional eternal realm to the subspace of our observed temporal reality of 3(4) dimensions occurs by or is a property of the action of consciousness.

We make the axiomatic assumptions that:

1. All spirit is matter; and that all matter under proper conditions may evolve to become spirit. (The latter being the task of the Earth)
2. That the mass of the Earth,  $M_E$  is equivalent to the mass of intelligence for all life living during all time ( $\sim 5$  billion years) of the Earth’s existence.

The mass of the universe,  $M_U$  is not nearly as precise as  $M_E$  and is derived from the Eddington and Dirac ‘large number hypotheses’ [18,52] for the number of nucleons  $N_p \sim 10^{80}$  in the universe. Since the mass of an average nucleon is  $1.6 \times 10^{-24}$  g multiplication tell us  $M_U \approx 10^{57}$  g. This will be utilized as the standard  $M_U$  for our  $H_R$  to be compared below with the mass derived from a conscious universe,  $M_{UC}$ .

The first part of the alternative calculation is to derive the energy of Earth’s intelligence  $I_E$  from its mass  $m_E$  by using Einstein’s well-known mass energy relation formula  $E = mc^2$ . With simple multiplication in *cgs* units using  $M_E$  as  $6 \times 10^{27}$  g and the speed of light  $c$  as  $3 \times 10^{10}$  cm/sec we arrive at a magnitude of  $5.4 \times 10^{128}$  for  $I_E$ .

Next, we find the radius of the Earth  $E_R$  from its circumference  $C = 2\pi R$ . If the circumference of the earth is taken to be  $\sim 25,000$  miles, converting to *cgs* we find  $E_R = 1.6 \times 10^9$  cm.

Finally from the Hubble radius,  $H_R$  of the universe  $\sim 14$  billion light years; we convert to *cm* to again be in proper *cgs* form for our purposes. Since the speed of light,  $c$  is  $3 \times 10^{10}$  cm/sec, and  $60s \times 60m \times 24h \times 365.4d$  seconds are in a year, we find  $H_R$  to be  $9.14 \times 10^{17}$  cm.

Using the noetic universe proportionality formula:

---

<sup>5</sup> Note that this noetic formalism takes the precise form as the fundamental equation for string tension ( $T = E/L$ ) in M-theory and could be said to represent an alternative manner for its derivation. See Chap. 4.

$$\frac{I_U}{H_R} \propto \frac{I_E}{E_R}, \quad I_U = \frac{H_R \times I_E}{E_R} \quad (2)$$

we find for the intelligence of the universe

$$I_U = \frac{9.14 \times 10^{17} \text{ cm} \times 5.4 \times 10^{128} \text{ cm}}{1.6 \times 10^9 \text{ cm}} = 3.1 \times 10^{137}. \quad (3)$$

Using Einstein's mass-energy equivalency formula  $E = mc^2$  again we convert to the complex mass

$$m = \frac{E}{c^2} = \frac{3.1 \times 10^{137}}{3 \times 10^{10} \cdot 3 \times 10^{10}} = 3.33 \times 10^{116} \quad (4)$$

Finally, we assume this is a complex mass related to the wave function of the universe from the Wheeler-DeWitt equation (5) [53-56].

If we interpret result (4) in terms of Cramer's transactional model of quantum theory [20] where all off diagonal advanced and retarded components of the wave function are considered to be physically real standing wave future-past elements; we may use the standard quantum equation  $\Psi = \psi\psi^*$  and take the square root of the complex mass,  $M_U$  of the  $M_U'$ . This gives the result for real Euclidean/Minkowski space the mass  $M_U \sim 10^{58} g$  which, within acceptable limits of error for cosmological numbers, is the same mass of the universe calculated by conventional cosmological means!

We use this phantasmagoric albeit simple calculation to suggest that for an anthropic multiverse a quantum condition of our virtual reality acts as a force of collapse of the wave function (reality is like a continuous measurement) such that  $H_R$  is determined by the mass of intelligence,  $I_U$  or  $I_E$ . This is the basis for fine-tuning in nested holographic anthropic pockets where each pocket has its own laws of physics based on this anthropic principle.

## 10. Wave Function of the Universe (WFU)

A number of authors have postulated a wave function of the universe satisfying the Wheeler-DeWitt equation with the general unexpanded simplistic form

$$H\Psi = 0 \quad (5)$$

which is a gravitational form of the Schrödinger equation suggesting the universe is described by a quantum wave function rather than a classical spacetime [53-57]. This equation has become the basis for theories of quantum gravity. Cosmologically this wave function,  $\Psi$  depends on the action of gravity and matter on a 3-torus for a closed universe. There are three main proposals – The Hartle-Hawking wave function [53,57], the Linde wave function [58] and the tunneling wave function [59,60]. While this avenue has spurred years of creative thinking, it remains insufficient to solve the problem. Many scientists currently believe we live in a quantum universe. This is not true; we do not live in a quantum universe any more than we live in a Newtonian universe. We live in a multiverse that is a continuous anthropic state (like a complex HD standing wave) of complementary classical, quantum and unitary parameters [19,20] requiring an ontological interpretation of the WFU [61]. Feynman has said that their might not be a quantum gravity [62] and HAM cosmology also suggests that this is true. The quantum regime has a limit in the same way the Newtonian regime does. The quantum world and gravity do not integrate with each other, but with unitarity. The purpose of the quantum regime is to separate the

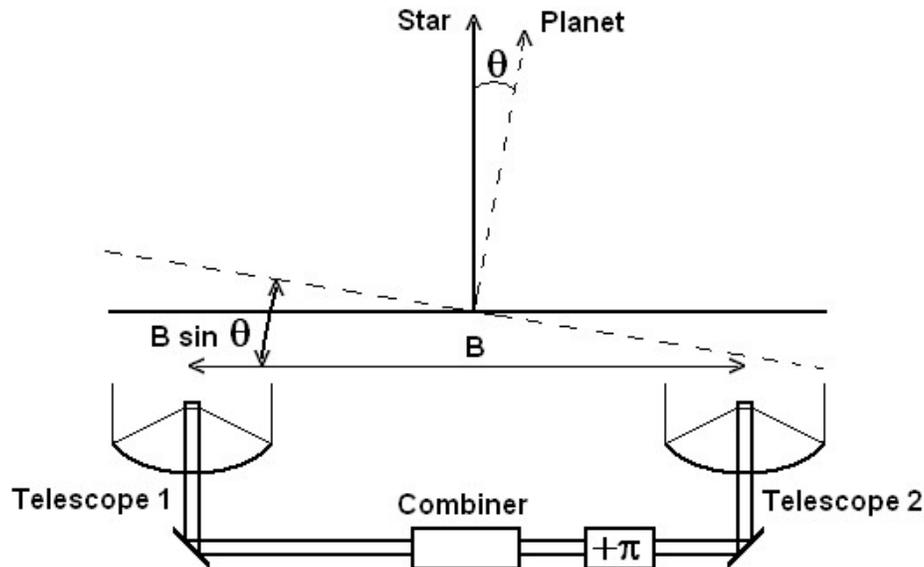
reduced or limited Newtonian AS from the new HD absolute space. This separation allows our temporal reality to ‘surf’ as it were on the face of eternity; and is why for Earthly observers reality appears 3D.

## 11. Subtractive Interferometry

The technology exists today to implement subtractive interferometry; but it will probably wait some twenty-five years before NASA-ESA will budget such a program. For SETI research a wide baseline interferometer is set up with telescopes on opposite sides of the Sun. Such a telescope array is able to subtract out stellar coronas which normally block ‘M-class’ planets from view which orbit too close to the star to be observed by conventional telescopes.

Subtractive interferometry is required for two reasons. M-class planets are much too small to cause a stellar wobble which is the method used to discover the roughly three hundred and fifty Jupiter sized extra-solar planets. When the stellar corona is subtracted out by interferometry spectroscopy may then be used to detect water and chlorophyll. It is these planets that are of paramount interest and where SETI searches should be concentrated for highest efficiency.

The technology to construct a pair of precision telescopes able to remain in formation while maintaining the required stability for observations is an engineering challenge, but researchers at NASA and the European Space Agency (ESA) have programs to meet the challenge. The ESA is developing a formation-flying interferometer, called Darwin, planned for a joint NASA-ESA mission before 2020.



**Figure 1.** Two telescope space-based nulling interferometer, simplest configuration for producing a dark fringe in the line of sight when properly phased. This destructive interference enables planet detection by subtracting stellar coronas when focusing the null region on the stars disk. Redrawn from [63].

## 12. New SETI Technology - The Interdimensional Q-Telescope

HAM cosmology proposes that a new type of interdimensional Q-Telescope is required for an anthropic multiverse in order for SETI to be successful. The Q-Telescope requires the completed 12-dimensional version of Quantum Theory that allows utilization of the Noetic unified field to obtain the information of other planetary civilizations. This information is lost to temporal 4D reality because it is only a subspace of the higher reality and some information is lost. Analogously this is the same as solving the problem of the 1<sup>st</sup> person 3<sup>rd</sup> person barrier in philosophy of mind and is also similar to the EPR paradox.

The new technology proposed is named a Q-Telescope (Q to represent both the mental Qualia and the Q charge of radio) to be designed to take these new considerations into account and perform a new type of advanced EPR measurements on Proxima Centauri. Currently EPR correlated photons are only created or entangled by simultaneous emission of photon pairs from excited atoms such as mercury. We currently do not have the ability to entangle uncorrelated photons in an interferometer for example by any known method of parametric upconversion [42,43] to obtain entanglement in the nonlocal eternal present with no temporal separation. What is the relation between the two types of photons?

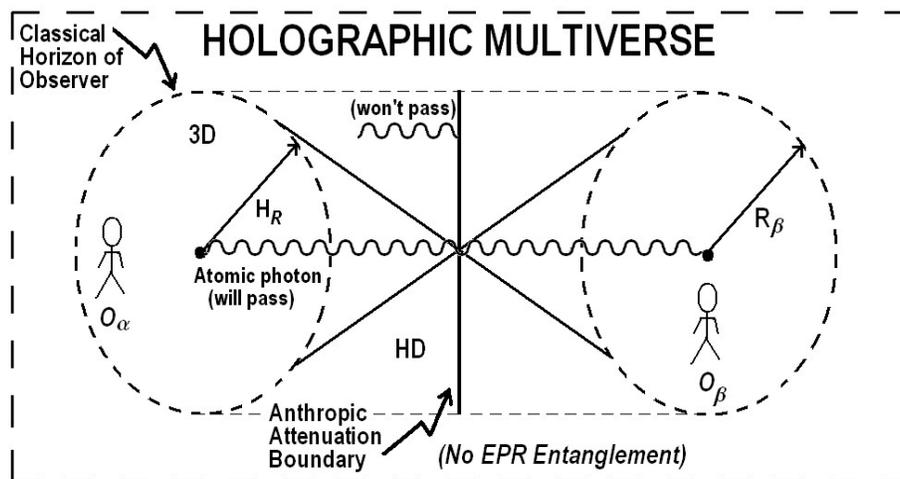
§2 In an anthropic multiverse because of inherent conformal invariance, the 1<sup>st</sup> person – 3<sup>rd</sup> person barrier said to exist between other minds is postulated to exist between extra-solar societies and our own because of the phase variation of fine-tuning making this information inaccessible in the usual 4D reality of standard measurement protocols.

How can this be logical since we can observe these planets? In the same manner we can observe other people but not observe their minds through telescope or microscope, only the matter they are made of.

It is now technologically feasible (although NASA says it will be at least 30 years before budgeting) to deploy a dual satellite system to utilize what is called ‘subtractive interferometry’. This entails putting a satellite on each side of the sun. Currently astronomers have discovered over 100 extra-solar Jupiter class planets by observing the slight wobble their orbits cause in the stars they circle. Earth type planets, the ones deemed most likely to produce life as we know it, are too small to create stellar wobbles and close enough to their stars to be unobservable because they are hidden behind the stellar coronas. Subtractive Interferometry has the ability to cancel out these stellar coronas so that powerful telescopes can search for Earth class planets. Once Earth type planets are observed; and it is speculated that they are common, spectroscopic observations can look for water and bioluminescence. Earth class planets with water are currently anticipated to be the most likely venues to produce technological societies.

So rather than broadband radio frequency searches across the whole sky as currently being performed by SETI programs; only the Earth class planets discovered by subtractive Interferometry would be investigated. These planets would be searched with the radically different approach using the new Q-Telescope technology. The Q-Telescope would be designed to utilize

1. a temporal adjustment accounting for the ‘Adam’s reckoning’ and
2. phase resonance protocols to couple to the ‘Intelligent geon’ state of the system.



**Figure 2.** In an Anthropic Multiverse causally separated nested Hubble spheres may have no EPR correlation because of the different basis for the temporal ‘reckoning’ of the denizens so that atomic photons will pass but anthropic photons will not.

According to Fig. 2, while ‘material’ or atomic light in  $M_4$  passes between the two causally separated observers; because each observers awareness has a different ‘reckoning’ [32] consciousness related phenomena like TV or radio program waves will be out of phase and require an HD parametric upconversion EPR process to synchronize the reckoning times as in the entangled state of simultaneously emitted photons in parametric down conversion by Hg atoms [42,43]. We admit this seems ridiculously strange to current thinking but we get halfway there by the clock paradox of special relativity where one twin space traveling relativistically away from Earth may age only 5 years while his Earthbound twin could age hundreds of years [64].

*Understanding holography in space-times other than Anti de Sitter space, e.g. flat space and cosmological space-times. This throws up new conceptual challenges. For example, the boundary of Anti de Sitter space is time-like, but the boundary of cosmological space-times is often space-like and for flat-space it is null. Extending holography to these cases, will surely be worthwhile [65].*

Because of the manner in which the skeptical scientific mind works, I suppose SETI-I is doomed to take some decades to fail before many will pay serious attention to the views presented here [66]. But instead of beginning to design a Q-Telescope 30 years from now when NASA and SETI programs might be ready to listen; perhaps if scientists start thinking about it now Q-Telescope designs could be ready at the same time. Because I for one don’t want to have to wait for Proxima Centauri radio or Barnard’s star TV any longer than necessary!!

### 13. Conclusions Contusions and Cowardice

On a lighter note, even to the authors (guilt by association) the concepts and postulates introduced here seemed utterly preposterous at first. It took many months to get used to them. Curiously though while in the process of habituating to the ‘strangeness’, we noticed a relationship that solved a medical research problem we were working on which gave us a new and deeper appreciation of the conformal scale invariant properties of this curious cosmological concatenation. This engendered the initial decision to outline the SETI framework and follow it to its logical contusions for the purpose of an entertaining and momentary escape from the drudgery of engaging in more complex conservative problems like developing a protocol for surmounting the uncertainty principle. We laughed at times thinking no one would ever believe such a concatenation of horrendous gewgaw. But now, years later we realize how wonderfully this marvelous heresy fits together in ethereal bliss. The test of time will tell if it’s ephemeral fantasy or not...

Still if the SETI-I protocol fails as anticipated, perhaps because of the explanatory power of other aspects of the theory someone may get around to empirical tests. Then we will see what merit remains for the ‘Earth being the center of the universe’... The Lord certainly does seem to work in mysterious ways because if we had not delved into this whimsical work (speaking now in terms of conformal scale invariance for certain physical principles) we would not have realized until much much later that these strange cosmological principles also apply directly to the microscopic scale in terms of the new noetic class medical paradigm we have been developing...

### References

- [1] Shostak, S. (2006) Listening for ET’s Television, [www.space.com/searchforlife/seti\\_shostak\\_tv\\_061109.html](http://www.space.com/searchforlife/seti_shostak_tv_061109.html).
- [2] Amoroso, R.L. & Pribram, K.H. (2009) *The Complementarity of Mind and Body: Realizing the Dream of Descartes, Einstein and Eccles*, Cambridge: MIT Press.
- [3] Amoroso, R.L. (2006) *The Holographic Conscious Multiverse*, in R.L. Amoroso, B. Lehnert & J-P Vigié (eds.) *Beyond the Standard Model: The Search for Unity in Physics*, Orinda: Noetic Press.

- [4] Amoroso, R.L. (2003) The Fundamental Limit and Origin of Biological Systems, *Noetic Journal* 4:1; 24-32.
- [5] Amoroso, R.L. & Amoroso, P.J. (2004) The Fundamental Limit and Origin of Complexity in Biological Systems: A New Model for the Origin of Life, in D.M. Dubois (ed.) *Computing Anticipatory Systems*, AIP Conf. Proceedings V. 718, pp. 144-159, Melville: Am Inst. Phys.
- [6] Amoroso, R.L. (2002) Developing the cosmology of a continuous state universe, in R.L. Amoroso, G. Hunter, M. Kafatos & J-P Vigier (eds.), *Gravitation & Cosmology: From the Hubble Radius to the Planck Scale*, Dordrecht: Kluwer Academic
- [7] Rowlands, P. (2007) *Zero to Infinity: The Foundations of Physics*, Singapore: World Scientific.
- [8] Plato (1989) *The Collected Dialogues of Plato: Including the Letters*, E. Hamilton & H. Cairns (eds.) L. Cooper (trans.) Princeton: Bollingen Series LXXI.
- [9] Meehl, P.E. (1966) The compleat autocerebroscopist: A thought experiment on professor Feigl's mind-body identity thesis, in P.K. Feyerabend, & G. Maxwell, *Mind, Matter and Method; Essays in Philosophy and Science in Honor of Herbert Feigl*, pp. 103-180.
- [10] Musser, G. (1998) String Instruments, *Sci. Am.*, V.10, pp. 17-19.
- [11] Drake, F. & Sobel, D. (1992) *Is Anyone Out There?* New York: Delacorte Press.
- [12] Beyond the Drake Equation (does calculations)  
[www.station1.net/DouglasJones/drake.htm#dolphin](http://www.station1.net/DouglasJones/drake.htm#dolphin)
- [13] [www.as.utexas.edu/astronomy/education/drake/drake.html](http://www.as.utexas.edu/astronomy/education/drake/drake.html); or  
[www.classbrain.com/artmovies/publish/article\\_50.shtml](http://www.classbrain.com/artmovies/publish/article_50.shtml); or  
[www.pbs.org/wgbh/nova/origins/drake.html](http://www.pbs.org/wgbh/nova/origins/drake.html); <http://frombob.to/drake.html>.
- [14] <http://exoplanet.eu>
- [15] Smith, J. (1974) *The Doctrine and Covenants*, D&C 88: 11-13, Salt Lake City: The Church of Jesus Christ of Latter-Day Saints.
- [16] Einstein, A. (1917) *Kosmologische Betrachtungen zur allgemeinen Relativitätstheorie*, *Sitzungsberichte der Preussischen Akademie der Wissenschaften*, 142–152; Also *Cosmological considerations on the general relativity theory*, pp. 177–188; (1923) in *The Principle of Relativity*, a collection of original memoirs on the special and general theory of relativity, H.A. Lorentz, A. Einstein, H. Minkowski, & H. Weyl, with notes by A. Sommerfeld; W. Perrett & G. B. Jeffery (trans.) London: Methuen & Co.; reprinted (1990); also (1952) New York: Dover.
- [17] Kant, E. (1787) *Kritik der reinen Vernunft*, Critique of Pure Reason, (1996) W. Pluhar (trans.), Indianapolis: Hackett.
- [18] Kafatos, M, Roy, S & Amoroso, R. (2000) Scaling in cosmology and the arrow of time, in R. Buccheri, V. di Gesu & M. Saniga (eds) *Studies on the Structure of Time*, Dordrecht: Kluwer Academic.
- [19] Wheeler, J.A. & Feynman, R. (1945) *Rev. Mod. Physics*, 17, 157.
- [20] Cramer, J. (1985) The Transactional interpretation of Quantum Mechanics, *Rev. Mod. Phys* 58, 647-687.
- [21] Bass, L. & Schrödinger, E. (1955) *Proc. R. Soc. Lon A* 232,1-6.
- [22] Einstein, A. (1917) *Ann. Phys.*, vol. 18, p. 121
- [23] Zwicky, F. (1929) *Proc. Nat. Ac. Sc.*, Washington, 15, 773.
- [24] Finlay-Freundlich, E. (1953) *Göttinger Nachrichten*, 7, 95-102.
- [25] Finlay-Freundlich, E. (1954) *Philosophical Magazine*, 45, 303-319.
- [26] Finlay-Freundlich, E. (1954) *Proceedings of the Physical Society A* 67, 192-193.
- [27] Born, M. (1954) *Nachr. Ak. Wiss. Göttingen*, 7, 102.
- [28] Pecker, J-C., Roberts, A.P., & Vigier, J-P (1972) Non-velocity redshifts and photon-photon interactions, *Nature*, v. 237, p. 227-229).
- [29] Pecker, J-C & Vigier, J-P (1988) A Possible Tired-Light Mechanism, *Apeiron*, No. 2, pp 19-23.
- [30] Vigier, J-P (1990) Evidence for nonzero mass photons associated with a vacuum-induced dissipative redshift mechanism, *IEEE Trans Plasma Sci*, 18:1;64-72.

- [31] Amoroso, R.L., Kafatos, M. & Ecimovic, P. (1998) The origin of cosmological redshift in spin exchange vacuum compactification and nonzero rest mass photon anisotropy, in G. Hunter, S. Jeffers & J-P Vigièr (eds.) *Causality & Locality in Mod. Physics*, Dordrecht: Kluwer.
- [32] Bible, New Testament, King James Version, 2 Peter 3:8.
- [33] Barrow, J.D. & Tipler F.J. (1996) *The Anthropic Cosmological Principle*, Oxford: Oxford Univ. Press.
- [34] Smith, J. (1974) *The Doctrine and Covenants*, D&C 130: 4-5, Salt Lake City: The Church of Jesus Christ of Latter-Day Saints.
- [35] Wheeler, J.A. (1955) Geons, *Physical Review*, 97:2, 511-536.
- [36] Shadowitz, A. 1968, *Special Relativity*, New York: Dover.
- [37] De Broglie, L. (1927) *J. Physique*, 6e serie 8, 225.
- [38] Kulhánek, J. (1965) Propagation of de Broglie waves in space-time, *Il Nuovo Cimento*, Volume 38:3; 1955-1965.
- [39] Feoli, A. & Scarpetta, G. (1998) De Broglie Matter Waves from the Linearized Einstein Field Equations, *Foundations Phys L*, 11:4; 395-403.
- [40] Jung, C. (1970) *Collected Works of C. G. Jung*, Princeton: Princeton Univ. Press..
- [41] Franck, G. (2000) Time and presence, in *Science and The Primacy of Consciousness*, R.L. Amoroso et al, (eds.) Orinda: Noetic Press.
- [42] Marshall, T.W. (2002) Engineering the vacuum, pp. 459-468, in R.L. Amoroso, G. Hunter, M. Kafatos & J-P Vigièr (eds.), *Gravitation & Cosmology: From the Hubble Radius to the Planck Scale*, Dordrecht: Kluwer Academic
- [43] Marshall, T.W. (1998) Parametric up conversion of the vacuum; [http://arxiv.org/PS\\_cache/quant-ph/pdf/9803/9803054.pdf](http://arxiv.org/PS_cache/quant-ph/pdf/9803/9803054.pdf).
- [44] Sagan, K & Drake, F. (1975) The search for extraterrestrial intelligence, *Scientific American*, May
- [45] Sagan, K. (1994) Search for extraterrestrial life, *Sci Am*, October.
- [46] Tarter, J.C. & Chyba, C.F. (1999) Is there life elsewhere in the universe?, *Scientific American*, 281:6, pp. 118-123.
- [47] [www.answerbag.com/q\\_view/506418](http://www.answerbag.com/q_view/506418).
- [48] Amoroso, R.L (2000) Derivation of the fundamental equation of consciousness, Part I, *Boundary conditions*, *Noetic J* 3:1, pp. 91-99.
- [49] Schwinger, J. (1992) Casimir energy for dielectrics, *Proc. Nat. Acad. Sci. USA* 89, 4091-3.
- [50] Schwinger, J. (1993) Casimir light: The source, *Proc. Nat. Acad. Sci USA* 90, 2105-6.
- [51] Schwinger, J. (1994) Casimir energy for dielectrics: spherical geometry, *Proc. Nat. Acad. Math. Psych.* 41:64-67, SF: W.H. Freeman.
- [52] Carter, B., 1974, Large number coincidences and the Anthropic Principle, in M.S. Longair (ed.), *Confrontation of Cosmological Theory with Astronomical Data*, Dordrecht: Reidel.
- [53] Hartle, J.B. & Hawking, S.W. (1983) *Phys. Rev. D*28, 2960
- [54] Halliwell, J.J., 2000, Trajectories for the wave function of the universe from a simple detector model; arXiv:gr-qc/0008046.
- [55] Vilenkin, A. (1998) The quantum cosmology debate, arXiv:gr-qc/9812027.
- [56] Smith, Q. (1997) The Ontological Interpretation of the Wave Function of the Universe, *The Monist*, 80:1,160-185.
- [57] Penrose, R. 2005, *The Road to Reality*, New York: Knopf.
- [58] Linde, A.D. (1984) *Lett. Nuovo Cimento*, 39, 401
- [59] Vilenkin, A. (1984) *Phys. Rev. D*30, 509.
- [60] Vilenkin, A. (1986) *Phys. Rev. D*33, 3560.
- [61] Callender, C. & Weingard, R. (1994) *The Bohmian Model of Quantum Cosmology*, PSA, vol. 1, D. Hull et al. (eds.) pp. 218-27.
- [62] Feynman, R.P. (1971) *Lectures on Gravitation*, Pasadena: California Inst of Technology.

- [63] Velusamy, T. et al (2001) Single and double bracewell nulling interferometer in space, Proc. Toward Other Earths: DARWIN/TPF; and the Search for Extrsolar Terrestrial Planets, Heidelberg, Germany. 22-25 April 2003 (ESA SP-539, October 2003).
- [64] Bohm, D. (1965) *The Special Theory of Relativity*, New York, W.A. Benjamin.
- [65] Trivedi, S.P. (2001) Holography, black holes and string theory, *Current science*, 81:12; 1582 -1590.
- [66] Basalla, G. (2006) *Civilized Life in the Universe: Scientists on Intelligent Extraterrestrials*, Oxford: Oxford Univ. Press.
- [67] Amoroso, R.L. (2010) A seminal introduction to immanent parameters of noetic medicine, in W. Carvalho & Pelizoli, M. (eds.) Proc. 1st Symp.for 'Cure and Consciousness' Nov. 6-8, Recife, Brazil.
- [68] Amoroso, RL (2014) Age of the Earth - 5 Billion or 7 Thousand Years: 'Young Earthers' Versus Evolutionists, <http://vixra.org/pdf/1410.0102v1.pdf>; Age of the Earth - 5 Billion or 7 Thousand Years, *Scientific GOD Journal*, August (2016) Volume 7, Issue 7, pp. 433-436, <http://www.scigod.com/index.php/sgj/article/view/492/540>.