# Some observations

## What follows is wildly speculative and ***quite probably utter bullshit***. Be warned!!!

The underlying reason for airing such absurd speculation is to try and show how a process of

1. reading
2. wild conjecture
3. establishing anchor points
4. readjustment to retain only the "fittest" conceptual "survivors"
5. iteration

can go on and on as a productive, iterative process getting closer and closer to potentially important realisations. The conceptions emerge in wild swings (of "good" and "bad") that eventually begin to dampen out towards something usefully productive. It represents an interest provoked leaning adventure. Perhaps it will work (expose more of the "truth"), perhaps not. I will have to wait and see. However, these observations - open thoughts -might just possibly prove to have a smidgen of provocative value somewhere. And, on the principle that, unless they are read, they will never have a chance of influencing anyone - here goes. These are "open", "unfinished" "thinks" that will mutate quickly as I discover the incorrect assumptions and omissions (the beginnings of new iteration cycles - frequently accompanied by much embarrassment). They represent a process of wild conjecture, interest provocation and then filtering out the worst dross. There ***will*** be many ***wildly*** wrong assumptions here but the general trend does suggest there are some avenues to explore. (The whole of the following section needs rewriting and clarifying and I will try and do that as things seem clearer to me.)

To start, I will make the following set of assumptions. The term “big bang” conjures up the impression that the universe came into being at a particular point in a(n eternal?) continuum of forward-time (firmly restricted to the 13.7 bn Yr ago to AD 2012 time-direction) and it exploded into some pre-existing spatial entity. This gives legitimacy to the multiverse idea where, somewhere over there and out of sight, countless other universes can exist. But space and time may represent an emergence that is strictly “ex nihilo” (out of nothing) from a zero-dimensional-zero-sized-zero-point-source that is outside of any process that could be described as time or space. The only thing that seems to be pre-existently "something" is the uncertainty about the exact nature of "nothing" - so that jitteriness emerges, differentially persists and accretes. Out of this uncertainty a full universe emerges who’s net energy (probability distribution around the mean) is zero. For every positive probability a balancing negative probability exists that leaves its energy balance (concentrated improbability distribution) at precisely zero. Everything is “centred” around a virtual singularity of zero size, zero mass, zero time and zero momentum (the virtual implies that zero is also virtual - rather like Quad electrostatic loudspeakers that act as virtual point sources - see page 10 of the brochure).

First: time and distance combine together to dictate how much energy is needed to move from one inertial frame to another (see New Scientist's 1 "One-Minute Physics" videos and select "How far away is tomorrow?"). So to move an object from <point A now> to < point B in the future> the following observations can be made. [To give image to this idea, imagine the object is a keratin fragment that has just fallen from the skin of your arm]. A slow leisurely move from A to B will require low force and low acceleration. A faster move from A to B needs greater force and acceleration. To get from A to B almost as fast as a photon would require enormous force and acceleration. To get from A to B instantly is impossible in classical physics and if special relativity "rules" are strictly adhered to. So, the "effort distance" of getting from A to B, slowly, is much lesser than the "effort distance" of getting from A to B, instantly. The difficulty in getting from A to B increases with the shortening in the time interval allowed to achieve the move. Effectively, from here to there instantly is massively (pun intended) more difficult than getting there in an hour. (Even the keratin fragment would become infinitely massive if it was made to move there instantly.) So what about getting from A to B in minus one pico-second? Does that have any real meaning? It ought to mean travelling to 1 picosecond ago (that is 1 picosecond in the past). So what might the graph of all those negative seconds look like? (They have happened, so they ***should*** have some representation.) Two things can be said about this. First, moving a highly ordered macrostructure (like, for example, your brain) to a point 1 pico-second ago is going to be far, far, far more improbable than the same brain assembling itself - from its component particles - by sheer chance (reminiscent of the argument that says that a Jumbo-jet cannot "spontaneously fall together" from a collection of its component parts - it is vanishingly improbable). Could the graph on the negative-passage-of-time side look very similar to that on our positive-passage-of-time side? This should be, effectively, a reflection. To get from A to B instantly would require a virtually infinite amount of acceleration (then deceleration - note it is a cycle !!). It would not matter if the

distance from A to B is just one millimetre. To get there less-than-instantly (say in minus one pico-second and in other words one pico-second ago - and this must be a real entity because it has just happened) would require "more" than an infinite amount of energy under the rules of classical physics - suggesting that it is "classically-impossible-physics" for even a keratin scale to move backwards into the past. But, Planckian time differences, Planckian distances and the resultant increasing probability of quantum "effects" might change this barrier (eg, quantum jumps, quantum tunnelling, quantum uncertainty). But at this acceleration-deceleration cycle our moving object would also become apparently minute, apparently supermassive and its "clocks" would, apparently, run exceedingly slowly (and even backwards, of course: this was the conjecture). So, the effort-distance travelled is traded from being something dominantly measured in metres to something dominated by mass - becoming supermassive and having a slow (or backward once "beyond" the SoL) running "clock". And yet it could still remain a combination of only one fempto-second and one fempto-metre away. So anything moving forward leisurely in time can quite easily look like increasingly big metric distances and anything moving backwards in time can look like smaller and smaller accumulations and concentrations of mass with a decreasingly slow running (or reversing) "clock". But, fundamentally, one fempto-second ago is still, potentially, just millimetres away even though it might be separated by an immense improbability barrier. As we go to shorter and shorter distances, a move from A to B instantly still remains classically "impossible". Once we get to Planckian time and distances, the quantum world can take over. We end up with an ultra-thin membrane separating now from the future and from from the past and quantum leakage might occur - perhaps in a capacitative way across this "membrane" (so, real particles might capacitatively exchange their real for virtual characteristics across the membrane between past and future). And, ultimately, by analogy with refractance, any approach to the membrane which is not in a normal (right angular) approach could be reflected backwards in mirror image form. Perhaps this could be interpreted as the R to 1/R inversion of physical laws that the string theorists have highlighted (where the combination of high energy string vibrations in a large dimension can have the same energy as low energy vibrations in a small dimension. Later, I suggest re-thinking this to R/<statistical mean> and <statistical mean>/R). Here, the theorists see a transition from a vibrating string that is shorter than its dimensional constraints into a wrapped string that is longer than the dimensional constraints. This emphasises points about circular "motion". It can be confined to the circle itself; if the circle centre progresses along some extended dimensional element, it traces out what we then call a sine wave (this might be equated to a vibration); or, the circular/oscillatory form can be wrapped, spring like, around the surface/margin of a compact dimension. (See the diagrams below - they emphasise how each form can morph into the others). Now, this could equate to our "outside the electron shell world" that we experience as a 3-D environment (the R universe) within which the "reflected" 1/R world of sub nuclear matter establishes a stable standing wave juxtaposition of the 2-D encasement by electron shells. So, the "now" membrane between "future" and "past" would lie somewhere between the electron shell and somewhere within the atomic nucleus. Since the R world seems to be dominated by a 3-D universe, the physics of R and 1/R forms appear to be indistinguishable, we might expect an "inhabitant" of the 1/R world to perceive a mirrored 3-D universe; and that, in turn, leads to a conjecture that the nine dimensions conjured up in string theory might be the product of 3 sets of 3 dimensional matrices (equalling an apparent 9-D matrix). This could be strung out from the "opposing sides" of a past-present-future "brane". This "brane" would lie physically (distance) very close to all observers' "nows". But, as I interpret it, this implies that the past might just be a reflection of the future in a fashion corresponding to an R to 1/R juxtaposition. The analogy might be better restated as the "now"-point and this - though more or less continuous with adjacent "nows" - is "projected" back to the virtual singularity of both individual and collective "nows" (as in the sphere diagram below - the third down). This Planck sized (non-zero) singularity corresponds to the virtual centre of mass whether it be a particle, atom, planet, sun, galaxy or universe (and any intermediate "collection"). Multidimensional compactification at this point means that quantum jumps are a tiny fraction (in 9-D - or more) of 1-D quantum jumps. It is likely that these jumps, from a highly improbable to a more probable distribution, are what we equate to time. At the singularity there are so many 9-D jumps to the 1-D jump that it takes "forever" to achieve it (c. 13.7 bnYrs). This is reflected in the Universe "expansion" diagram below. "Now" will turn out to be a poor analogy - a fulcral point of maximum compactability is a better metaphor.

Now we can get a glimpse of what galaxy, solar and planetary orbitals might be about. To remain close to the "now" point, in opposition to the jittery world of photons, that are so light that they want to flee off at the slightest "nudge" and at (what we perceive as) the speed of light into the future (think of the metaphor of Brownian motions), our planetary systems seem to want to stay closely attached to what we see as the past (but it is this "now" point). The centre of the mass that constitutes a human body is (for the vast majority) less than a metre away from the immediate past. We already know it is possible to move into the future (arrive at your 100 year old son's funeral for example). To do so we would have to undergo prolonged acceleration and this is the so called "twin paradox" for spaceship travellers. But an enormous amount of energy (injection of improbability) is needed to achieve this. But, the barrier to the past is (classically) unachievable.

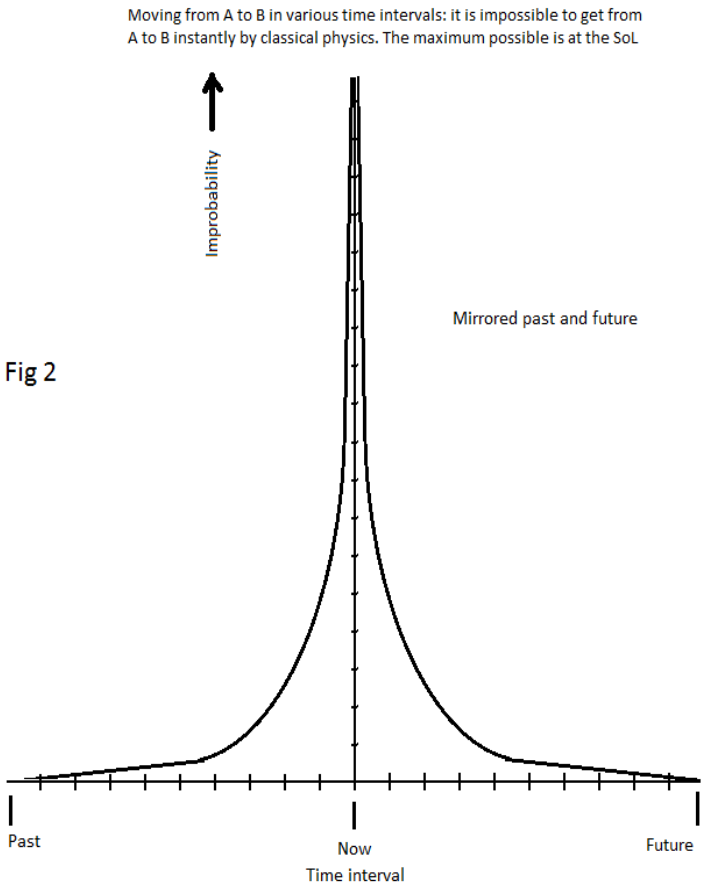



Fig 2

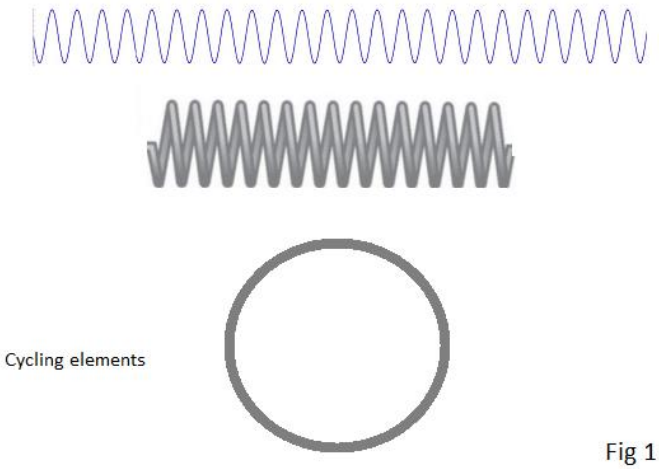



Fig 1

The important point to absorb about this "winding/vibrating" point is that there exists an R sized dimension with a low frequency vibration that is as energetic (statistically improbable) as a 1/R dimension with a high frequency vibration and could be described as a "reflection".

The view from within a nucleus of one of our constituent atoms (at the Planckian centre of its mass) may well seem as though they are much closer (than we perceive) to adjacent nuclei, to the centre of the earth, to the centre of the sun, to the centre of our galaxy and its black hole event horizon, and even to its "virtual singularity". It is only their centrifugal tendency that stops them from completing their collapse to a singularity. This is just a more metaphorical way of stating what Einstein introduced us to with warped spacetime. So, mass (multi-D) wants to disperse towards the past and condense towards the future. Light (1-D) wants to disperse towards (flee into) the future and to condense towards the past (imagine a big bang video seen in reverse as it accretes together and implodes to nothing). But the two might be reflected "back and forth" (in a static rather than oscillatory fashion) between the two virtual sides of a "virtual singularity" which are, in actuality, both extremely close to "now". And that "now" is relative to each and every A to B movement (remember that wherever there is a temperature, atoms do not stay at rest). To us, though, matter "appears" to be unequivocally condensing, and light unequivocally expanding into the universe's deepest corners.

If we accept the earlier idea that the quantal objects that make up our universe are scattered around the mean and that the event horizon of a black hole is relatively close to the event that we call the big bang (effectively, a relatively short "effort distance" from it), then we can surmise that the negative time (the backward in time bit - the minus one picocecond all the way back to the beginning which is the "big bang") also has a similar asymptote. Now this double asymptote is looking pretty familiar and rather similar to a statistical distribution about the the most improbable. If we think of the situation that exists in deep intergalactic space, then the probability of noticing a forward or backward in time event is, there, more likely than it is in our parish where we occupy an incredibly improbable state of negentropy (I will call this side of going forward in time "positive-negentropy" and going backward in time "negative-negentropy"). The higher up the asymptote we get, the more improbable (harder to get to by sheer chance) our condition is. However, this position that we humans occupy is quite likely to be one of very high order rather than just being highly (spontaneously) improbable. And the one at the bottom of the scale, one of very low order (bland sameness) that is also highly (spontaneously) probable (a very high entropy state). This puts carbon based life forms and the emergence of a technologically advanced society very high up the "functionally-ordered" scale. (Note that

high entropy and low order - and vice versa - are not obligate "bedfellows": I have already pointed out earlier that "a highly ordered" and "high entropy state", can co-exist.)

The two asymptotes in this graph should never actually (classically) meet. They will get to a Planckian physical distance apart and at these scales we should be able to see backward in time events occurring as quantum fluctuations or jumps (and we do see them !!!!). But the overwhelming mass action effect of "positive-negentropy" will ensure that we never get to see much evidence of these events at the macroscopic level. Exceptions to this general invisibility probably include the observed outcomes of slit lamp experiments. Note that we already know that light cannot go faster (from our persective) than the speed of light BUT it can, instantly reflect at the speed of light without "flinching" - this could be very relevant.

I guess that, if it exists, the "join" between the future and the past when encountered at the mean in deep intergalactic space is mostly occurring at a very "bland-sameness" level. So, a question: towards the extremes of improbability and order, is a technologically advanced society, together with all its technological trappings, more functionally-ordered than a neutron star? And is it more functionally-ordered than a "sea" of electromagnetic waves "charging around at the speed of light"? And what about the conundrum of "the big bang" - which was simultaneously very bland (near uniform) yet unbelievably improbable; viewed afresh from the above perspective, this might not look quite such a contradiction.

The implication of this double-asymptote diagram is that it is a shorter "effort distance" to move into the future, down into a black hole then back through "the mean" and then into the past so that we might arrive at a point 1 pico-second ago. For macroscopic structures, going straight across the double-asymptote-barrier could be a similar if not higher energy (improbability) barrier. (Note that we humans like to think of the possibility of time travel whilst maintaining our highly improbable configuration - i.e., a structurally-intact-thinking-barely-aged-human-being). And it is extremely unlikely that we could ever enter "negative negentropy" whilst retaining that formed state (we would be long dead, decayed and dispersed to a particle or even electro-magnetic wave mish-mash). In, fact, it looks like we would just be reliving our historical emergence from star dust, to amoebae, to fish, to quadrupeds and finally to humans and our own parents getting together to create us.

So what might represent this barrier - this 2-D membrane - between the future and the past? It is tempting to see this, at least on one side, as the combined 2-D spheres of the electron shells - particularly the inner electron shell. Each electron shell represents a higher and higher barrier to "penetration". The inner 2 electron shell (the hydrogen atom like shell) is the ultimate free electron barrier that separates the past from the future. That leads on to a thought that time might be the reciprocal (the 1/R equivalent) of what we regard as distance (the R equivalent) which we perceive as part of the extra-electron-shell world and it is the "distance" that we feel at home with (rather than "time" as the distance). Within that shell - inside the nucleus in particular, dimensions are closed down (or wound up) and time slows and there are hints that entropy can appear to be reversed with initial accretion in the future and dispersion in the past. So, across the entropic mean, positive neg-entropy is characterised by the R "universe", by "effort-distance" (space-time) that is predominantly "felt" as metres and it is dominated by negative charges on the outside of atoms; on the other side of the mean, the negative neg-entropy side, "effort-distance" (space-time) is dominantly appreciated (by us) as time, it is characterised by the 1/R universe, it is intra-nuclear (within the atomic nucleus and probably "beyond its virtual "centre of mass" singularity) and it is dominated by positive charges. But these positive charges are possible virtual loans from the other side of the "now" point which, if they had not crossed the "now" barrier, would be occupants of a positive charge on the outside universe.

Now the double-asymptote-barrier mentioned earlier conjures up the metaphor of the previously mentioned six sided dice. Seen from one side only, there is a never a zero dice throw (only -3 -2 -1 or +1 +2 +3 where opposite faces ***always but always*** add up to zero). Electromagnetic waves (or string structures), the metaphorical dice equivalent, should, therefore, always come as matched "pairs" of equal but opposite magnitude that really do sum up to absolute zilch. It is tempting to ask if that might be why we find it hard to find magnetic monopoles. Space itself might be the construct of multiple pulses of circular magnetic fluxes - multiple rings of "space" that "overlap and coalesce". Everything is cyclical (wave like) - including the ultimate and largest cycle that joins the "beginning" (big bang) to the "end" (black hole). I am tempted to think of an electron as a unit composed of an R plus 1/R pairing. This pairing is the backdrop on which the standing wave of electron matter is composed. The R element is a supermassive disk of "positive" electromagnetism dispersed through space (so we don't appreciate its "positivity" and the 1/R element is a miniscule disk of "negative" electromagnetism that has "leaked" to the other side. The electron negative disk can wrap around a tiny positive (nuclear charge) but this sphere size dictates its "string" wavelength which corresponds to the "reflection" in an anti-matter world of our "past" (see below) of the R radius of an antimatter magnetic field. This helps to make it clear why magnetic monopoles are hard to find - we would need to look for them at an R sized object. Note that all this suggests that the very fabric of METRIC space is created by the R representative of this (opposite disk face) pair. They cannot interact to slide back (as electromagnetic waves) to nihil/zilch UNLESS we can expose an electron to a positron (for example). Then the two 1/R components are positively and negatively charged and the two R components are similarly Positively and negatively charged. They can then "collapse" instantly back to the mean - but seem to do this - from our perspective - the "long way around".

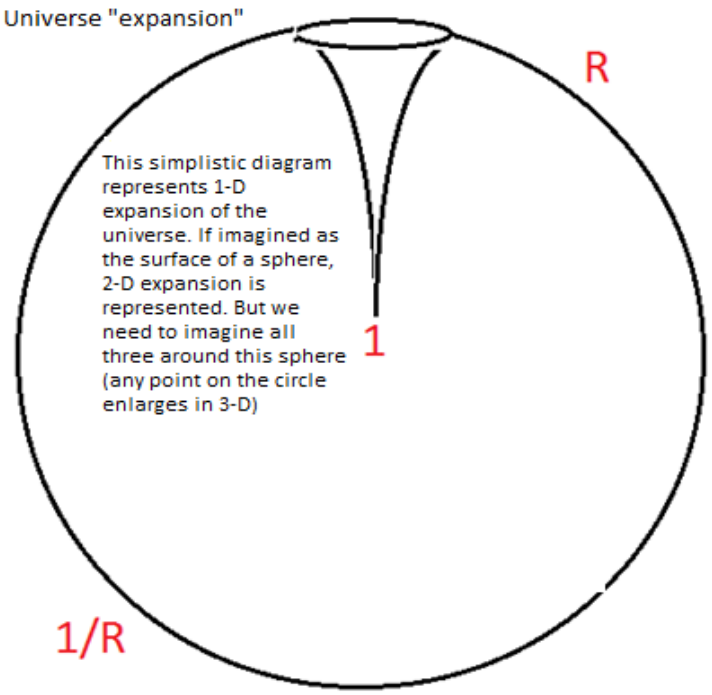



Fig 3

The circle circumference represents just one of the 3 dimensions that we experience when we move. Each of these 3 dimensions must be imagined as a stretching band that snaps out of existence (it never happened) once there is insufficient energy to support it (it reaches a limiting Planckian energy level). The cone shows the effect of increasing dimensions and mass. At the bottom of this conic well is the Plank sized singularity (represented by **1**) and matter "resides" in its walls. Spacetime at the periphery is "all space" and in the centre at the base of the well it is "all time". It is likely that wherever you "stand" on the circumference, you will see your local spatial extent as R sized but your antipodies will be interpreted as 1/R sized (this is exactly analogous to two spaceships travelling at the SoL with regards to each other - each sees the other as flattened with a very slow running clock; but that is thinking only of 1-D; in 3-D the other is "flattened" in all three dimensions).

In a quantum world, extra dimensions "deeper" than 1-D might be expected to never fall to zero but to some (virtual?) miniscule but finite Planck sized distance. So for entities largely confined to a 1-D "existence", distances may not be completely devoid of some trading off of their dimension for time. There could be a tiny trade off and this might contribute to the observed limit to the speed of light. Time is - in the limit and once unleashed from the multidimensional cages of atoms - returned pretty much to just a distance (and, of course, vice-versa!!). The energy that becomes tied up in matter may be the consequence of its "dive" and "condensation" into 2-D, 3-D, 4-D etc dimensionality. This just might help contribute to the observation that light always seems to move away from higher dimensional conformations at the "speed of light" (3-D for us - we cannot measure the SoL without a 3-D instrument of some sort). But this velocity is only achieved in the absence of intervening "matter" - ie, in a vacuum. It is already believed that matter is the product of standing waves and standing waves regularly form where two or more waves are travelling in opposing directions. Ultimately, if an electromagnetic wave is a loop filament (connected at it's "birth" between the upper face and lower face of our metaphorical dice), then we need to conceptualise what happens when

positive and negative energy interact, unravel multidimensional stable standing waves and allow the collapse of an "existential loop filament" (an annihilation?). So, from a photon's view, its companion photons can be across the universe in an instant. From our view, we are left looking at the consequence of the collapse of the existential loop and the loosened filament is now "somehow" affected by a return "journey" in reverse time back to its origin where it rings (oscillates) on arrival in the past (what we would consider to be the origin and an instance of "cause and effect"). So could light always appears to arrive at the target at the speed of light because it represents the released end of the filament actually leaving the "target" in reversed time. There might be some value in developing and refining this metaphor. Maybe not, however. I will leave this to the reader.

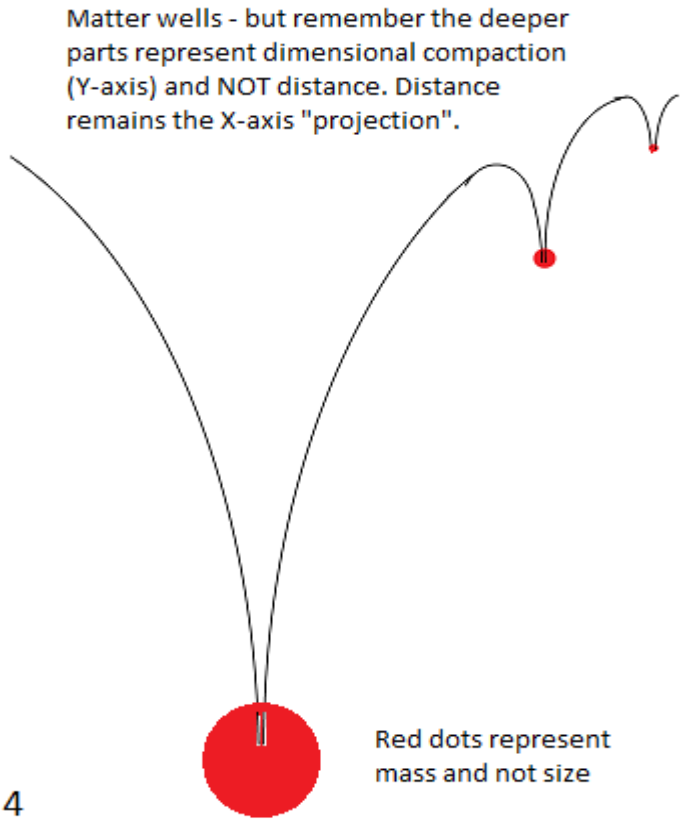



Fig 4

This gives us a better feel for what might constitute forward in time entropy and backward in time entropy. Remember, time is probably just a distance but, unlike the time taken for a 1D light beam to get to the moon and back, distance that goes through many dimensions is characterised by an increasing trading off of simple distance (1D space) into (multi-D) spacetime - in which our (human) perception becomes largely focused on time. They are both ***just*** distances (or probably - and more exactly - effort-distances). So what we would consider to be forward in time is (effort) distance travelled in the direction "mapped out" from its origin in the multi-D "core" (denoted as 1/R in the diagram above) to the periphery of this expanding light (1-D radius) "sphere" (and denoted by R). So travelling "backward in time" is equivalent to moving progressively more deeply into multidimensionality (where gravity increasingly "dominates" our experience of it). Ultimately, returning to the "beginning" would occur at or within the event horizon encircling a (virtual?) singularity - a black hole. At this point the capacitor "dielectric" may break down and this would act rather like a water reservoir's overflow funnel.

It might be useful to think of a wave as a circular phenomenon; a pulsating flux of magnetism (an expanding then contracting ring of alternating N->S then S->N fluxes) that alternately expands then contracts into 2-D "space"; this then "pushes out" an alternating +ve then -ve charge that is in step but at right angles to the magnetic flux; then we need a "rail" ("strings" or "filaments" in space) so that the pulsating magnetic flux can work its way along the "rail", "away" from its creation-point (rather like those railway handcars, often seen in old western films, that are hand "pumped" along the rail). This "rail" should be at right angles to the other two (Maxwell). It might just represent the superimposition of our metaphorical handcar over a much larger electromagnetic fluctuation. Whatever, it is in this arena of electromagnetic oscillations that the condensation of persistent matter should begin to emerge out of the

quantum foam that is a fundamental property of tiny distances.

The requirement for the theory of inflation is predicated by ourselves when we insist on a unidirectional straightjacket for time. If our baryonic universe is an emergent phenomenon, then there may be no need to dive closer to the "virtual" singularity than the event horizon. The forward and backward flows that create the standing waves of matter would "hinge" around the event horizon or to a virtual (but non zero) point - a virtual singularity. The passage of time at an event horizon is virtually at a standstill; so, if this was first formed early in the history of our universe (our straightjacket for time suggests 13-14 billion years ago), its time is very much closer to the "big bang" than we are. Could this mean that, at least, some Hawking radiation is released in the past, closer to the "big bang". In extremis, if the black hole started to accrete at the "moment" of the "big bang", then Hawking radiation could be part of that radiation. In this view, the present and future could all be "going down the plughole" back to the beginning. But all this apparent "movement" may simply be a parochial illusion as we have to claw our daily lives up the "falling steps" dominated by electron shell repulsion (just to stay still); this is our most immediate and dominating encounter with the "entropy driven" repatriation back towards nihil/nothing. Photons do not experience any passage of time (effectively an electromagnetic wave is able to transfer an energy packet - a statistically improbable occurrence - across vast distances of space). Rather than time being "slowed" to a virtual standstill (as at the event horizon) photons have traded virtually none of their 1-D distances into creating a time interval (one metre is 3.3 nanoseconds and 3.3 nanoseconds is one metre; it is impossible, in 1-D and in a vacuum, to be greater or less than this; excepting when we drop to Planck sized distances, time and distance are synonymous). It is only when we try to measure the time it takes to move from one piece of baryonic measuring apparatus (a set of standing waves) to the next (set of standing waves) that we impose an apparent velocity on the process. To interact, the photon's energy packet has had to dive down into a multidimensional realm where some distance is traded for "time".

Quantum jitteriness could represent a constant uncertainty of exactly where a wave "is" on a "string". This could become manifest, initially, as apparent 1-D "translocations" consequent on the occurrence of variously improbable quantum jumps.

(From our parish!!): at one extreme we have 1-D (occupying) light waves/photon complexes. These are so light that they form a perpetual "Brownian motion" like dance. The slightest disturbance will send them careering off at the SoL into the future.

At the other extreme we have concentrations of mass that, if projected back to a virtual singularity, occupy Planckian multi-dimensional volume and extremely small size. Unlike photons, that take virtually no effort to accelerate to light speed, such a singularity is "infinitely hard to set in motion.

These contrasting properties echo fundamental aspects of the quantum world. With light, we can know how fast it is going but can't tie it down to any place. With a massive singularity, we can know where it appears to be but we cannot attribute it any speed.

This following point could prove to be what is - essentially - a tautology. When we play around with electrical circuits, if we want to store electrical energy, we employ capacitors. Now, the closer that we can get each plate of the capacitor together without touching or allowing the electron-excess/electron-deficit to cross the gap, the more energy we can store in that capacitor. There comes a point, though, where the potential difference between the plates grows so much that the capacitor's dielectric barrier (air, dielectric material) breaks down and the energy just dissipates into a flash of photons and heat. Now, the double assymptote pictured above, between "the past - representing the positive charge" (one "plate"), "now" (the dielectric) and "the future - representing the negative charge" (the second "plate"), should act just like a highly efficient capacitor that is capable of storing vast amounts of energy (what we recognise colloquially as $e=mc^2$). What constitutes "the past" and "the future" will not quite be what we naively expect from our parochial experience of time. It will be "coloured" by positive-negentropy and negative-negentropy and will be, ultimately, closely linked to effort-distance. So the whole concept of time may need to be reinterpreted as a function of distance and quantum uncertainty.

Now, we have a situation where highly improbably distributions of energy (itself a statistically highly improbable distribution) have "emerged". If the SoL limit is pretty much absolute then crossing the dielectric (now) becomes increasing hard the closer we try to move from A to B instantly (or even just into the past - an even higher spontaneously improbable barrier). So, the docking of fresh energy (photonic wave packets) into the "capacitor plate" is likely to be a very fussy recipient. Might it be that, like entering earth's orbit from deep space, the approach conditions need to be just right (and vice versa for leaving). The speed of light limit that we are accustomed to may be more a property of the "capacitor plate" (the 2-D spherical electron shell) than the filament that carries the photonic

wave packet. We already know that the orbital frequency of electrons dictates the frequency of photons released from this shell. Some property of the conversion of the 2-D rotational speed into the 1-D photonic wave packet speed must mean that, whichever electron shell ejects the photon, it is converted to the same 1-D photonic energy packet speed. Could the SoL limit be dictated by electron shells rather than - as we traditionally see it - an intrinsic property of "light itself" (which we tend to regard as a single entity but it is a conglomerate of different factors, for example carrier filament, wave packet, frequency, propagation speed, wavefunction, oscillating charges and magnetic fields). Only finely tuned wave-packets may, then, be capable of contributing energy (higher improbabilities) into to the grand matter-capacitor. This needs thinking through but may be important. I am not aware of any method of measuring the SoL that does not involve interaction with an electron shell.

This leads into a consideration of the top and obverse sides of our metaphorical dice. I have already implied that the positive and negative sides of negentropy that are distributed around the mean must be in perfect, absolute balance. There should be no transient borrowing here (which CAN occur when we look at just the top sides of the dice or vice versa). A positive deviation around the mean MUST be perfectly balanced with a negative one if the principle of generation "ex nihilo" is to remain strictly balanced. So what features constitute the positive and negative deviants that arise "ex nihilo"? One option appears to be two waves that can, theoretically arise out of nothing provided they shifted through 180 degrees relative to each other. Such waves can also annihilate completely. Another possibility is that the string theorists' R and 1/R universes represent a perfect balance about R/R (this should equate to 1 unit - probably the Planck length - nothing can be smaller - so like our 6 sided dice, zero values never occur). That puts the fulcrum clearly at the Planck distance and this would fit nicely with our atomic capacitor being close-ish (by our macro-standards) to this point. Furthermore, we can now conjecture that the progression from R to 1/R goes something like this (1-D to 9-D representing one dimensional to 9 dimensional):

$R \quad R_{1\text{-}D} \quad R_{2\text{-}D} \quad R_{3\text{-}D} \quad R_{4\text{-}D} \quad R_{5\text{-}D} \quad R_{6\text{-}D} \quad R_{7\text{-}D} \quad R_{8\text{-}D} \quad R_{9\text{-}D} \quad R/R$ (Planck scale) $\quad 1/R_{9\text{-}D} \quad 1/R_{8\text{-}D} \quad 1/R_{7\text{-}D} \quad 1/R_{6\text{-}D} \quad 1/R_{5\text{-}D} \quad 1/R_{4\text{-}D} \quad 1/R_{3\text{-}D} \quad 1/R_{2\text{-}D} \quad 1/R_{1\text{-}D} \quad 1/R$

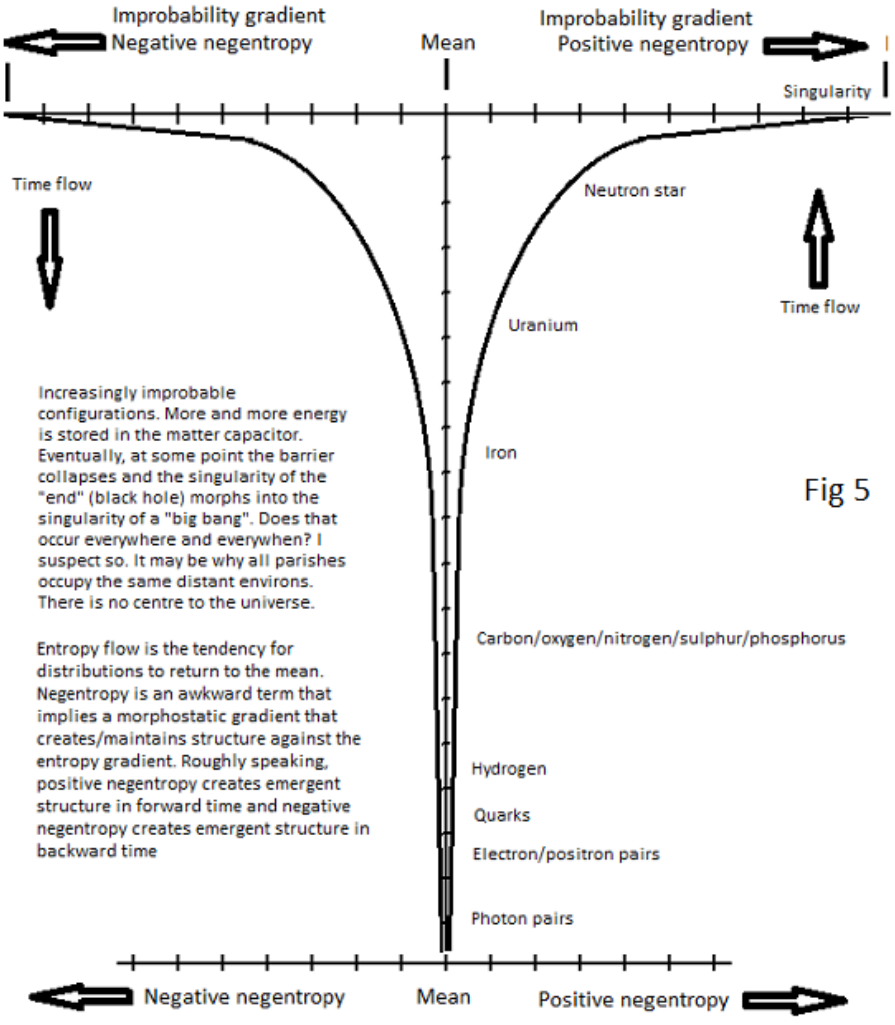
Nuclear matter will accumulate somewhere towards the centre of this sequence (at least partially on the 1/R side) and the transition - through or towards the $R_{9\text{-}D}$ to $1/R_{9\text{-}D}$ transition, will occur somewhere WITHIN the depths of the nucleus of an atom. And, if you were an inhabitant of the 1/R world, you would probably regard yourselves as the R version and us as the 1/R version. The cone that subtends back to the beginning (the "big bang origin" in the above diagram) would have the R dimension on the outside of this light sphere with this sequence running down towards the origin of the light sphere. Quite what happens once we are down to $R_{9\text{-}D}$ is not obvious from the current conjecture and needs consideration. I will guess that the $R_{9\text{-}D}$ to $1/R_{9\text{-}D}$ transition requires the severest of improbabilities and equates to a black hole/ big bang "virtual singularity", whilst the matter that constitutes the environment of mother Earth does not dive so deep that the "storage capacitor" "breaks down" to allow the ultimate annihilation of the stored energy. (Note that to confine an electron within a nucleus would require a phenomenal 3.77 GeV; CERN can reach into the TeV range and still - apparently - be short of creating a black hole.)

Ultimately, in a grand explanation of what is happening, I suspect that we will have to get rid of the millstone idea that time is "real". By that, I mean that time is considered something where the past is gone and ceases to exist and the future is equally non-existent until it has has happened. In this scenario, the only real "events" are so transient that they are long gone within femtoseconds. Now, Einsteinian physics already suggests this is a parochial view because different observers observe different "nows" and these "nows" clearly remain inter-dependant. What the "giant capacitor" idea does is to give some feeling for how distance is spread out in a matter containing universe. In reality, everything probably exists "stat" - the past, now, the future, space and matter: they are all there and imprinted within the "mathematics". This is comparable to a DVD of a computer game - everything is "on the disc" and stays there even though the game can only be appreciated (by most punters) when played in "real-time" and to them it appears to be highly versatile in its output.

The emergence of matter and intelligent life must "grow" in incremental steps. Linnaeus' statement "Nature does not make jumps" could be paraphrased into "Nature does not make big jumps." Emergence occurs through sequential steps of gradually increasing interactive-complexity that are small enough to allow some sort of "ladder" (remember the previous observation that on either the top or the obverse sides of our metaphorical dice, highly unusual one-sided distributions can occur by sheer chance, whereas the sum of the front and obverse sides of the dice, when added together, always returns a value of absolutely "zilch"). Having a configuration that allows balanced positive and negative neg-entropy to reside closely side by side (the matter capacitor) without "touching" (annihilating) enables a series of progressive steps. Indeed we can see these steps occurring in the production of hydrogen, helium and lithium (big bang), then the ignition of nuclear fusion leading on to the creation of heavier elements (carbon, oxygen etc), then supernova explosions and the creation of even heavier elements (iron being very important to our existence), then the collapse to a neutron star (electrons and protons squeezed to nuclear size to form neutrons (but still "held apart") and -

finally - the conditions where the capacitor gap (perhaps) breaks down and what ensues is a singularity that tracks back to the beginning. The outcome is, potentially, a circuit where the uncertainty principle generates endless virtual photons and "heavier" particles that may persist, occasionally, either side of the mean (in balanced forward and backward "time"), evolve into galaxies and eventually disappear down a black hole plug hole before being re-circulated back to the general quantum foam. What "persists", counter to this flow, is a morphostatic structure of galaxies stars and planets with occasional inhabitants that maintain their own form by various feedback processes. Don't forget that the flow is occurring both in (what we consider to be) forward and backward time depending on whether it is extra-electron-shell or intra-nuclear.

In this scenario a technological society might even be able to establish the conditions to ensure its own "creation" (either knowingly or unknowingly). This society has the potential to close out the time loop by initialising the configuration and conditions that would allow itself to emerge in the first place: but that is extremely, extremely, **extremely** conjectural.




So how could emergence from quantum foam occur? Current concepts are riveted to the belief that time is a real entity that is independent of anything else (that is, it is not an illusion brought about by the way other "forces" affect matter). These concepts are riveted to the assumption that this time goes forward (1912 to 2012 direction) everywhere. However, this apparent time direction is imposed on our senses (in a domineering way) by electrons and electron shell repulsion. This and the "release" of electromagnetic radiation that can then track off into the deep voids of space clearly point to an apparent single direction in which entropy increases. However, I have already alluded to the possibility that gravity affects atomic nuclei and baryons in a way that could be interpreted as a "backward in time" dispersal (back to nihil, zilch). If this is possible, then to fall down the +ve side of the diagram below has to be done in what we consider to be a 2012 to 1912 direction. But the past (big bang expansion) and the future (black hole collapse) may be much closer than we imagine - if not "the same phenomenon" viewed from two alternative

perspectives. If this were the case, then we now "see" evidence suggesting cosmic inflation because we refuse to consider it as part of a counter-current flow of two differing entropies that affect all matter. To accept the scenario that all matter "exploded" in the instant of a big bang is majestically more of an improbable event that a jumbo jet falling together from its constituent parts (even more improbable than one punter winning all the worlds top national lottery prizes every week for a year). To get around this we have to imagine multiverses that test all the various possibilities until one bubble universe emerges that is just right (Goldilocks stuff). But, evolution and emergence are well proven permissive systems. Given the option of which one to prefer, I know where I would like to place my lottery bet. And experience suggests that patterns are reiterated throughout the universe. If biological evolution (the auto-catalysis that leads to emergent systems) can do it then the atoms and constituent waves, from which biological molecules are constructed, can almost certainly replicate this step.

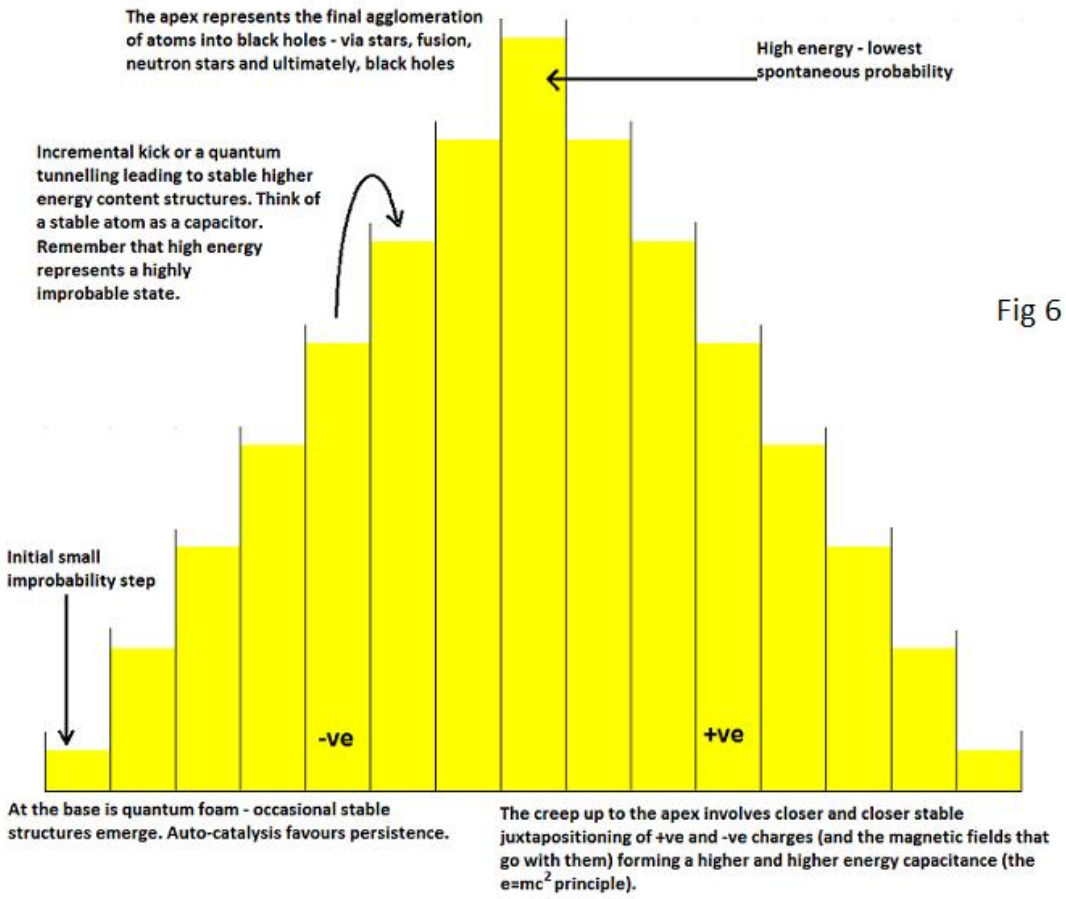



Fig 6

Note that our current view of inflation tries to stuff the right hand (+ve) entropic stairs into a "1912 to 2012" time direction. So we could be interpreting +ve charge entropy as an apparent emergence from a Planck sized singularity up towards the event horizon.

AND MORE ABSURD CONJECTURE !! I have missed a most interesting metaphor. It is likely that these probability-steps do not, themselves, "move" with time. They are "rigidly" defined and fully outside of "time"; they just "are" or, more importantly, have the potential "to be". Think of the system as acting like an up and down elevator side by side, separated by the smallest of distances (at least as small as the distance from the electron-cloud to the nucleus). There may be a counter-current set up at "now" (between past and future) with quantal uncertainty having a dramatic influence between the yoctosecond (and less) division between the past and the future. This improbability barrier between the past and the future is too high to cross classically but quantal uncertainty of may allow a regular (quantum foam like) "breaching" of that barrier (and that fits nicely with the influence of virtual pairs in quantum mechanics). All we see, hear, feel and measure is, at least to a greater than infinitesimal degree, dominantly a property

of the past (unless they are quantal uncertainties). It is this "jittering" uncertainty that drives the up/down escalator and the standing waves of matter. Now, might there be a flop transition (at now) from a "negative-charge-on-the-outside"/"positive-charge-on-the-inside" to a "positive-charge-on-the-outside"/"negative-charge-on-the-inside": a mirror image of past and future. String theory does seem to suggest the very-big could become suddenly (apparently) the very-small and vice versa. Note that these mirror images should be extremely close to "now". There is no need for the standing waves that form matter to continue right up to the apex of the probability curve before "falling back". Anywhere up (and down according to perspective) the escalator matter standing waves can settle. At the apex, the maelstrom of a "black-hole"/"big-bang" singularity ensures that structures are ripped apart to their constituent particles (strings?) with electrons falling to one "side" and positrons to the other (as Hawking radiation?). The zenith of the apex could well set the values of both Planck's constant and the "speed of light". The place where order can reach a maximum should be within the spiral arms of a galaxy. This explanation helps to appreciate better the constant "rocket-motor" of gravity. And time disappears as an independent, primary entity; it becomes a combination of charge "direction", quantal uncertainty and entropic gradients (the latter going in different directions for different "string-structures"). And, on the uncertainty principle, think of a matrix of +3 to -3 dice faces. The quantal uncertainties mean that, though and in general, the dice throw has been made and is fixed there is the potential to "flip" (eg, -2 to +2). This uncertainty can "test" multitudinous possibilities and select the ones that define matter and our baryonic universe. When we look at the "remnants" of the big bang we may simply be looking at the two sides of the apex (the analogy being the opposing faces of the dice so the apex is simultaneously of the past and of the future - depending on perspective).

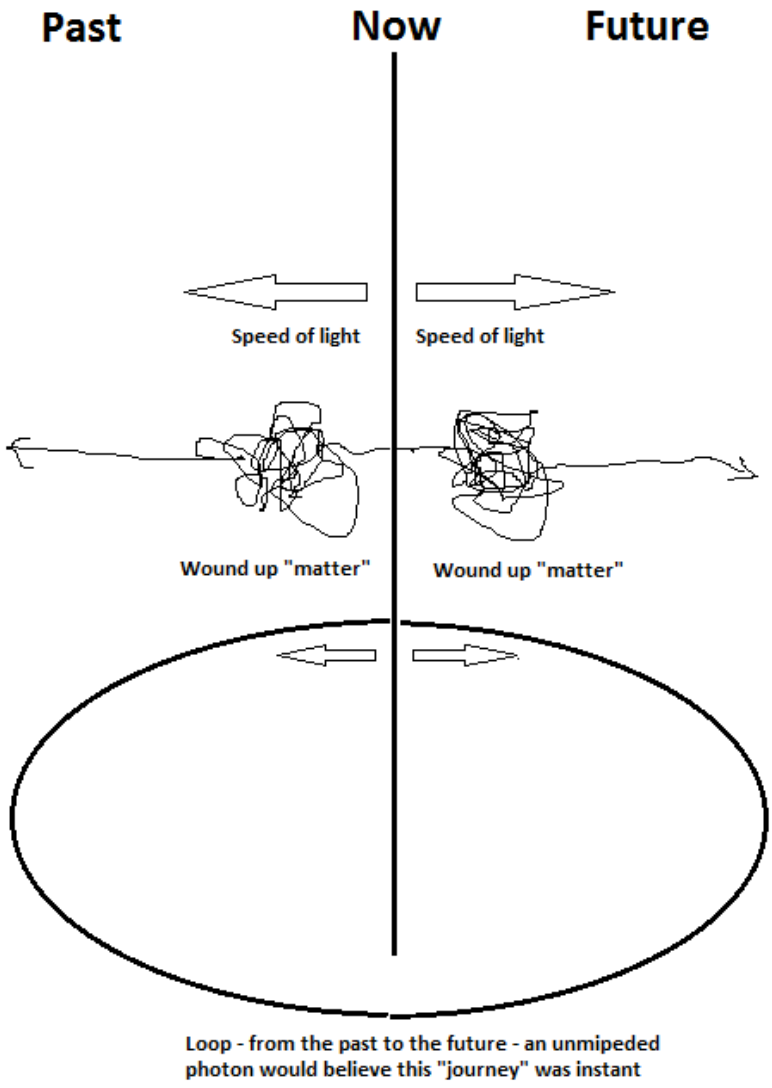



Fig 7 E-M waves could form as 180 degree out of phase pairs that "depart" from the "now" membrane at the SoL. (This is analogous to the upward and downward pointing faces of dice.) They can wind up into extra dimensions to form "matter" and thus slow down their departure from "now" (very dramatically; when at a black hole event horizon, virtually no movement will occur at all and time will apparently stand still although their constituent E-M waves are still travelling, through multiple wound up dimensions, at the SoL - It is just that they have to go on the most circuitous route possible; effectively, the black hole is travelling at the SoL relative to the now stream of quantum foam.) An E-M wave looping from one side of the "now" membrane to the other will "believe" that it has made this journey instantly (it is not bound by time). We will think it has taken 13.7 bn years because we are measuring the slow down that we have introduced in the winding up process. The probability of avoiding all

obstructions when looping from now-past to now-future is possibly very low so only a small population might be "instantly around the loop". The vast majority of E-M waves will find a 180 degree out of phase wave that is otherwise (vector, polarisation, amplitude and frequency) identical. And most of these "annihilations" (more akin to equilibrations in this instance) will happen in the quantum foam. (This is analogous to the random distribution of dice values that are spontaneously possible on the upward pointing faces of dice; with more and more dice, the average of all individual values get closer and closer to the mean.) In our "chiral" universe, negative electric charges are to the outside of atoms and positive to the inside. Could it be that, across the now membrane, the opposite it true and that we have a mirror image of ourselves in antimatter peeling away from "now". It is fairly clear, now, shy the speed of light is always constant - it is always travelling away from now. It is also clearer why we cannot travel faster than the speed of light - we would transfer to the future side of now (via the long loop rather than tunnelling across). We could probably tunnel across as matter pulverized into constituent strings through a black hole.

So, in deep intergalactic space, the "now" membrane is dominated by quantum foam. Remember, everything we see, feel, touch and measure is - to a least more than an infinitesimal value - in our past. In a black hole event horizon, the now membrane has an enormous flux of E-M waves.

This "now-membrane" concept needs much more thought. For instance to see how it joins up through adjacent points in space and in three, rather than one, dimensions. However, I think it is very promising metaphor.

Note that the "now-membrane" for we humans on earth does not warp by more than 0.05 secs (12,750/300,000 -the "light" speed across the diameter of the earth - neutrinos would go straight through in this interval).

Now we can go back to the probability about the earlier probability diagram, turn it on its side and draw it with a mirror image below it.

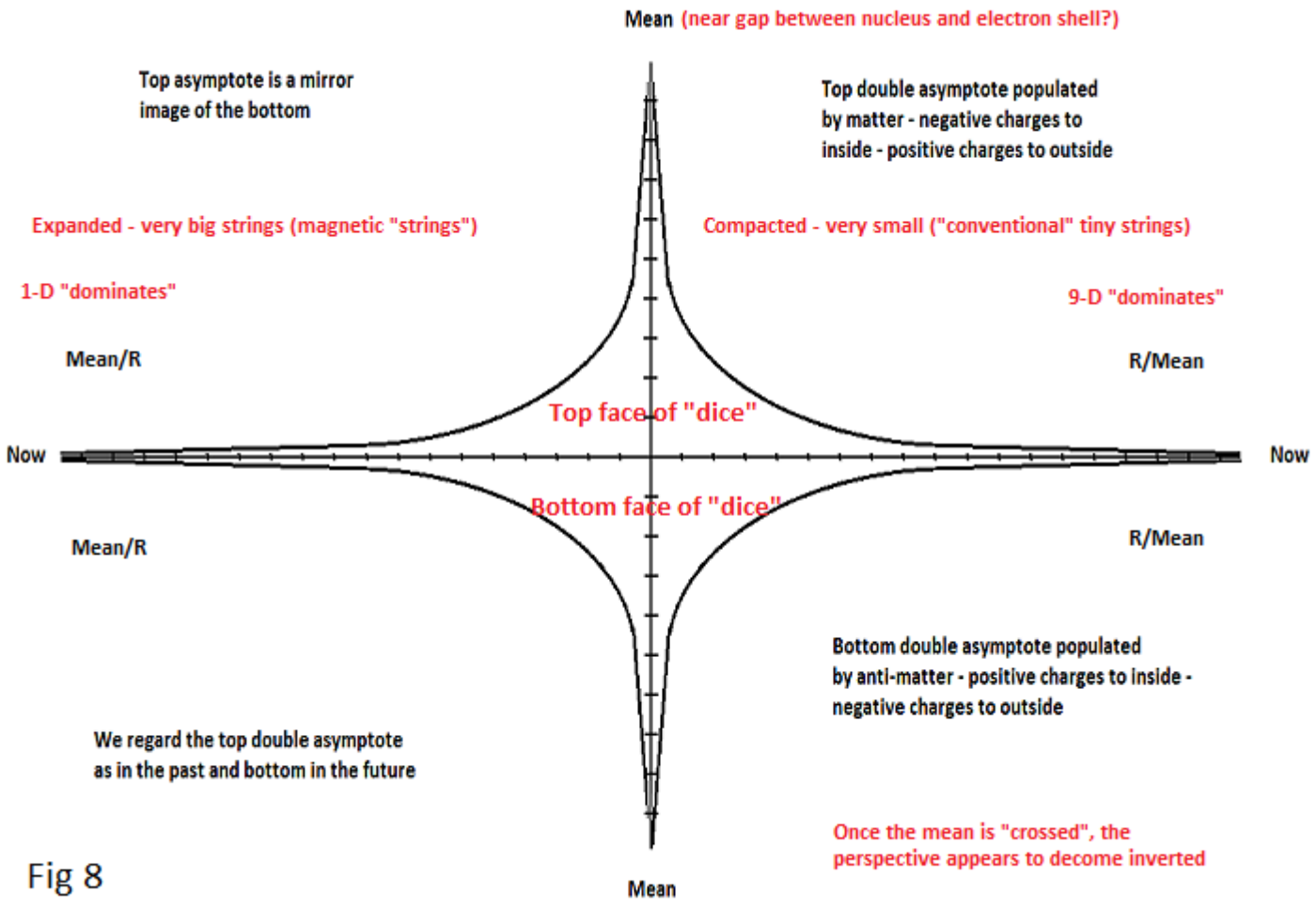
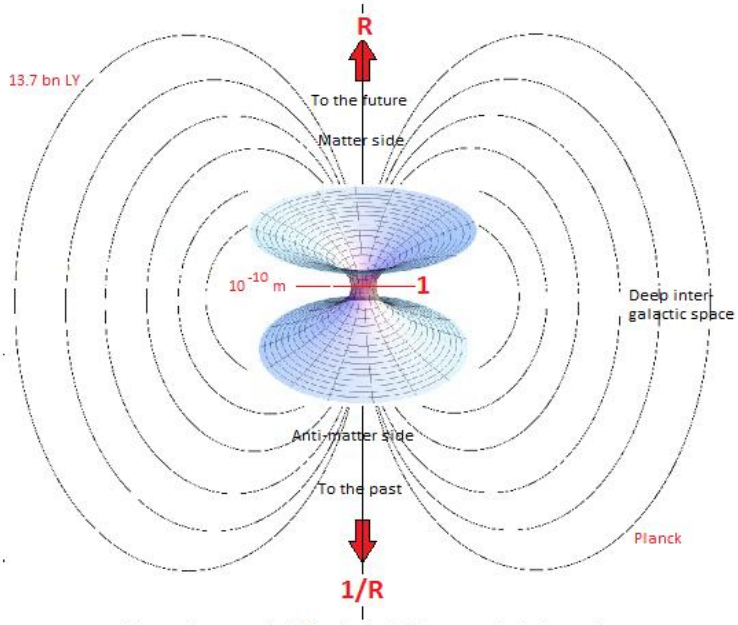



Fig 8

LEFT - a wormhole where the neck of the funnelling black hole opens into a tunnel to "another universe" or, as I suspect, "back to nothing/zilch" in our own universe. "Other" universes might be possible but there is no reason why

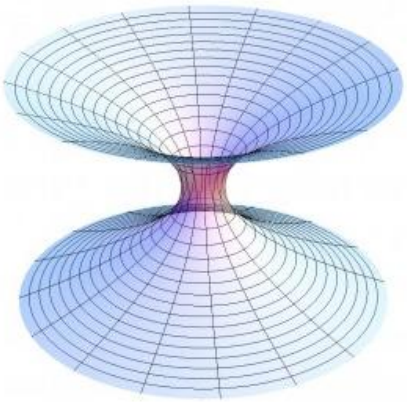
they should be in any contiguity in any way with our own. I suspect that space (our space) is created "ex nihilo" and it is not an eternal-background-constant ready to be invaded by other universes. If we extend the trumpet ends around into a doughnut, we end up with a spatial structure as in the diagram above (Universe "expansion") where there are a minimum of two funnels "back" to the big-bang/black-hole interface. My current guess is that there are only two funnels (all black holes "jin up" before going through the ultimate - Planck sized - singularity) but there may be many indentations into the "surface" that makes up that funnel. Einsteinian diagrams of an elastic spacetime membrane already show our sun, earth and moon together "demonstrating" this. And these spacetime "trampoline" grids begin to resemble the magnetic field lines of an extremely large bar magnet. This (recently found) Youtube video adds some extra interest to the idea - the "Orange Universe". A second torus sequence "floats" more possibilities.

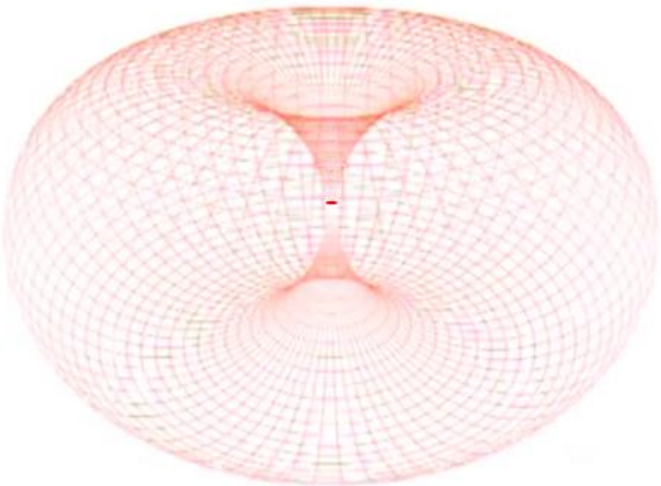



To an observer at the 1/R pole the R-1/R perspective is inverted

Fig 10

Fig 11





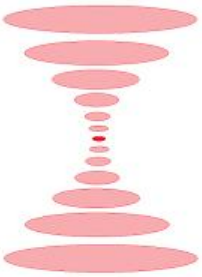
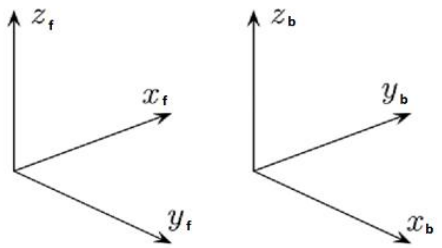
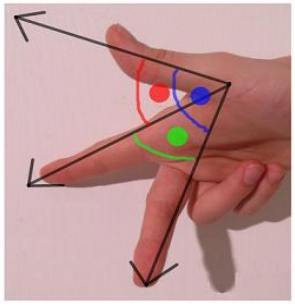


Fig 9

The central red disc is the transition ("now") point. It looks as though paired discs of positive and negative charge (net energy = zero) can occasionally migrate from this zero energy "now" point and form electron/positron pairs to occupy opposite poles. This central point might be around $10^{-10}$ metres (around electron shell size) and correspond to the 1 in the R and 1/R string dimensions.

Now, everywhere, copious quantum foam is flowing across the "now" membrane but Past and Future flows are mirror images of one another. So is our immediate past is an anti-matter reflection of ourselves? If we fold this last diagram



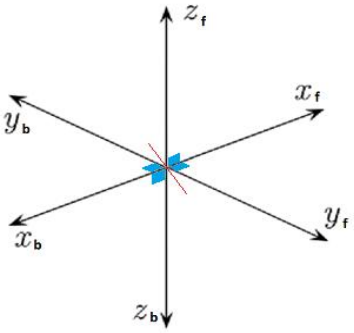



Fig 12

around the mean so that Now 1/R is side by side with Now R, we have the "double up/down escalator". Furthest from the mean the R represents the most unfolded diameter of the universe (something related to the 13.7 bn light years we interpret). And similarly, the 1/R represents the compacted multidimensional "matter" streaming through the event horizon (or virtual singularity) of a black hole. The anti-universe side of the black hole equates to our big bang. We occupy a parish way down away from the mean. The very large majority of the quantum foam flow finds an annihilating E-M wave partner within a very short distance.

The big problem now is to think what the dice throw (scatter) represents: many, many scatterings or just one lucky throw? I think the answer could be that the standing waves of matter "accrete" on multitudinous scatterings but time has a very different meaning now - the laid out scatterings are probably "outside" of time. Like playing a DVD, the property of time may come about by "reading" information that is embedded in a static probability distribution .

The reflection raises one more interesting possibility. For example, if we were to look into a black hole, there is a point where the density of concentrated "matter" reaches a peak. If we look at refractance, the angle of incidence to the surface where transmission out of the medium stops and internal refection occurs to nearly all of the light that flow is from a less dense medium: roughly, the denser it is the greater this angle. In the extreme of a black hole this angle could be a Planckian fraction away from 90 degrees (a perpendicular). This may have some relevance. It is already obvious that light gets in but not out and the likelihood is that the situation is somehow reversed for the 1/R side.

Matter will emerge only in the neck of these funnels with the heaviest objects (event horizon and neutron stars) occupying the lowest points and the lightest (hydrogen atoms included) occupying the higher points. Referring back to the universe expansion diagram (above) the linear distance will still be the distance across the funnel - not down the funnel and we need to remember this only helps us to easily appreciate two of the three spatial dimensions we are used to. Matter will not flow around the margins of this "sphere". Only electromagnetic waves (or leptons) can skim around its circumference.

So, this leads on the the possible significance of a disc of magnetic force that can emerge in the "observable" dimensions. The "observable" ones are the big ones for us. Remember that what looks big or small to us can, in a mirrored situation, look like the reverse - small and big in string theory. Thus we can have these pairs:

zf+zb zf+yb zf+xb

xf+zb xf+yb xf+xb

yf+zb yf+yb yf+xb

These could represent the "explorable" dimensions in which pairs could emerge as disc like magnetic/electric pairs and each would "obey" the classical Maxwell rule of electromagnetic force. The force could be the expansion of each space possibility. When the f and b (forward time and backward time) are place as a full 3D diagram, the "now" point is at the intersection and there is an enormous energy barrier needed to cross this intersection. That is represented by the red line between the b's and the f's. The blue markers represent right angles.

Remember that the possibility is that this disk of magnetism could be invariably paired with very small disc of electric force (it may have a large electrical and vectored force but it occupies a very small volume). And across the now barrier, the reflection reverses this (an R to 1/R transition - a mirrored arrangement.

(Nb, these pictures taken and adapted from Wikipedia)

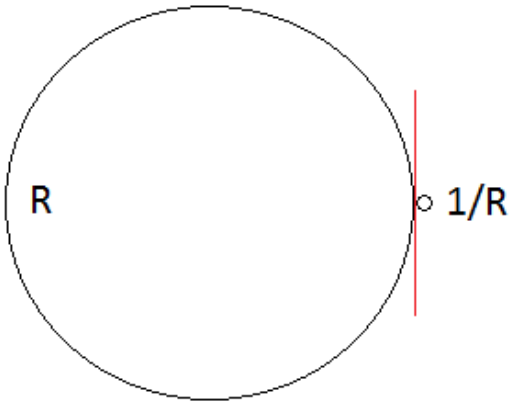



Fig 13

The R sphere and 1/R sphere will "look" different from the two sides of the (red) energy barrier. The R will be the largest in backward entropy and the 1/R in forward entropy - so which one is the 1/R depends on which side of the red barrier you take your perspective.

The "cartesian" co-ordinates shown in the previous diagram are really meant to represent pole co-ordinates on two spherical spatial extrusions whose poles lie in juxtaposition to each other. They become Reimanian co-ordinates.

Note that the 1/R "sphere" has a chance - through uncertainty - to move into the realm of the R "sphere" and so appear to become a property of the R side of the energy barrier. Now, these chance (and energetic) transpositions may be what give rise to stable matter because they create stable juxtapositioning of positive and negative charges. A true reflection MUST be created on the other side to compensate the temporary "loan". The initial structure should be a 2-D disc that can then wrap around space: the R and the 1/R disc may well have their virtual centres in the same place. The wrap around 2-D sphere certainly appears to be an emergent property that is associated with electron shells around an atom. It is important to try and get away from the idea that time is a real and independent property that is distinct from spatial extent. It may be that time emerges from the multidimensional compaction of the quantal jumps that are possible in 1-D structures (they are far shorter in 9-D space). Spatial extent seems to emerge as a disc of magnetism (an electron or positron transformed from the 1/R to the R form). (The "real" difference in sizes of these two spheres are, first, at the limits of universe expansion - c. $10^{28}$ metres - and, second, the smallest possible length - the original "inflaton" point of c. $10^{-50}$ metres. And these provide a $\log_{10}$ "half way point" not far from the inner electron shell size of $10^{-10}$ metres.)

Some extensions: we can now get a feel for the emergence of matter. Most of the time, a little uncertainty will allow a perturbation that "allows" a magnetic field to expand as a disc then a bubble of space on either side of the now (the nothing, zilch point)- it will quickly expand and subside unless stabilised. Each side borrows "time" from the other side and, if the forward time side could see the backward time side's magnetic field, it would appear to each like a point electric charge (think of the analogy with the clocks on moving spaceships - who is running slow? That depends on your perspective of who is travelling near the SoL.) Every now and again the energy borrowed is large enough to create some uncertainty about over which side the point electric charge is on; then it can apparently become part of the opposite side of the "now" energy barrier. Say it was an electron that appeared then a positron must become visible on the other side of the "now" barrier - because it is a mirror image. Effectively, electron-positron pairs are generated across (and either side of) the "now" point. Note the analogy with the mechanism of Hawking radiation. But at this stage they are never seen as a pair on one side (both if we remember the mirror) of the "past" or the "future". However, if - as we can do - we inject enough energy (improbability in the form of intense and energetic light) into the system, then we can entice an electron/positron pair to appear both on our side of the "now" point and, of course, the mirror image also occurs "over there". So this is one of the simplest generations of matter (an electron-positron pair either across or on both sides of the "now" point). The electron-positron pair appearing on our side will quickly interact with themselves of other electrons (though "other" is hard to ring fence in quantum mechanics) and, if they are anti-particles in that environment, release their stored energy to slip back to nothing as electromagnetic radiation. But,

it slips back by "travelling" around the R diameter rather than "down" into the 1/R direction (it "takes the long way round"). The 1/R component of these R-1/R pairs retains its natural entropy gradient that is "pointing" it "the short way" back towards nothing and this is in the opposite direction to the entropy time direction that dominates our lives. It is a manifestation of the up/down escalator concept outlined above.

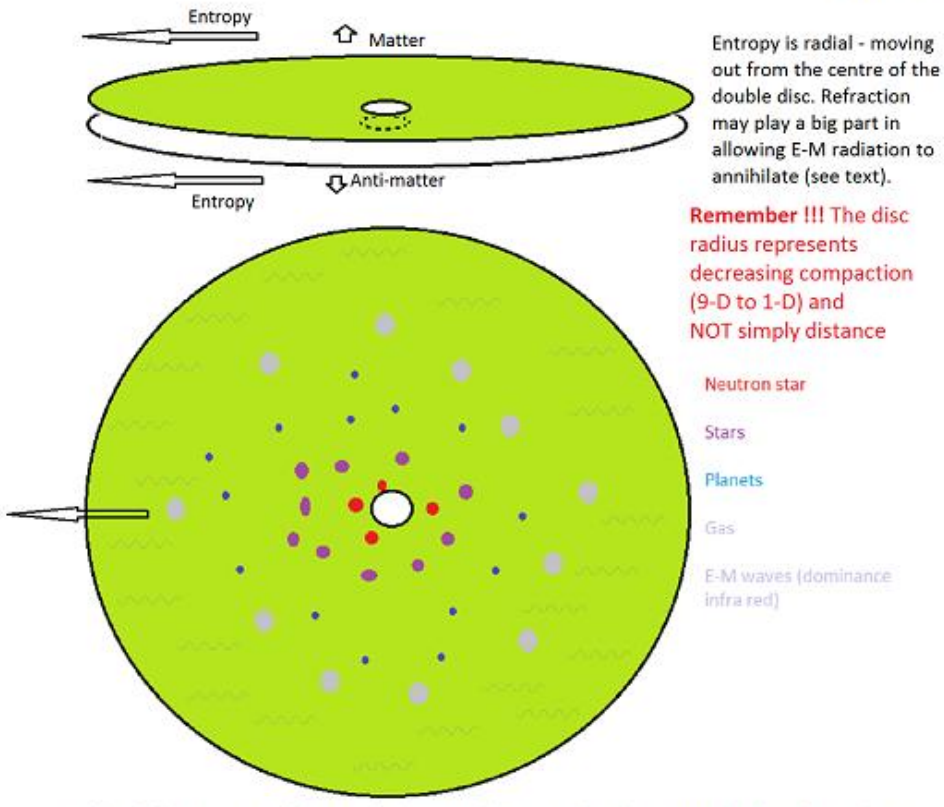
So - how ridiculous is that? - an anti-matter copy of yourself all within one metre away in the past. It clearly does not look like that. BUT, think it through as an electron. The biggest part of you is a very large positively charged 2-D membrane that can wrap around a large area of space and then a tiny borrowed bit from the past that retains its 1/R nature and turns up as the negatively charged electron 2-D structure that can wrap around an atomic nucleus as a 2-D membrane. If we shift the now point a tiny distance from the future to the past (that is, it sweeps through) then the transition of the electron in this sweep is that, suddenly, the tiny 1/R structure becomes the large R and vice versa for the R structure to the 1/R structure and and we now have a tiny positively charged "particle" set in an very large negatively charged disc or spherical surface. That is, is has become a positron. We don't need to bother too much with the nucleus (though a similar transition should occur) because the vast majority of the volume of matter in our parish is dictated by electron shells. This switch from future to past and vice versa must be hinged on the virtual singularity of the centre of mass of an atom. This is probably much more closely "contiguous" with the centre of mass of the earth, the sun, the galaxy, than we can readily comprehend. (This all needs much more detailed thought and interpretation but it offers some possibilities.)

The "speed of light" becomes dictated by the ratio of how many quantum jumps your parochial wound up state needs to take to equate to a 1-D photon (or "string" if we need to remove all vestiges of 3-D from a photon). So, the SoL will always be read according to ratio of the 1-D quantum uncertainty to the multi-D quantum uncertainty of the measuring device. So, in air, water and glass the SoL decreases progressively from that in a solar system vacuum (the vacuum of deep intergalatic space is probably significantly different to the solar system vacuum as the latter is pervaded by substantial amounts of magnetic flux).

A further interesting thought is one concerning the reflection. Anyone who had played with looking into opposing mirrors will know that there is the first immediate and big reflection of you (which is a bit smaller than the real you) and then a succession of smaller you's stretching out into the limits of retinal definition or of failing reflected intensity. This might prove relevant.

This may all be very, very wrong but it has kept me amused in conjuring it up. And perhaps something will make someone think "I can knock this into much better shape".

Fig 14




Position of elements around the matter/anti-matter discs. Remember the outer portion is well towards a 1-D population and the centre (neutron stars) well on the way to 9-D. Spacetime at the periphery is dominated by great distance for little passage of time: at the core it is dominated by little distance for great passage of time. I suspect that this is dictated by the relative distance that individual quantum jumps can accomplish.

Another way of representing things is to think of it as two discs abutting one another (this renders a fairly clear appreciation of two dimensions; adding a third dimension is harder to visualise, so we need to simplify it by considering just two at a time). Much like the expanding space-time sphere (above) that represents the three spatial dimensions as just two on its expanding spherical surface, this disc analogy may help to simplify the conception.

Here, the ***matter*** universe we recognise is spread over the top disc. Its increasing entropy is directed towards our future: the "reflected" ***anti-matter*** universe is spread "under" the lower disc, with its increasing entropy directed to what we regard as our past. On our, ***matter***, side the dominating mass action of electron shell repulsion

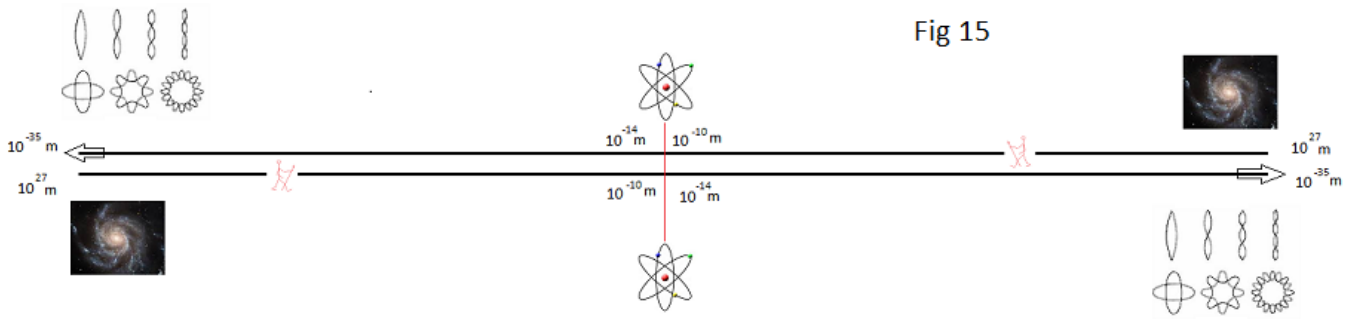
determines the arrow of its entropy. On the ***anti-matter side***, positron shell repulsion should determine the direction of entropy increase.) The two are an exact reflection with every matter particle being reflected by an anti-matter particle in the lower disc. Both dominantly "point" into deep intergalactic space where low frequency radiation will "eventually" annihilate. Now - the importance of refraction becomes significant. The way that light is trapped inside a black hole is pretty much paralleled by what happens when refraction turns to reflection. Photons that are approaching the margins of a black hole ***from the "inside"*** cannot escape. Perhaps something that approaches the margin at a Planckian fraction less than 90 degrees (normal to the surface) might escape (provided the density boundary is less than infinity to one). But due to the R to 1/R inversion - and the perspective that the anti-matter side perceives the situation to be inverted means that there may be a figure of eight "flow" from the R (extra- electron shell side) to the 1/R (intra-electron - or intra-nuclear - side). This would mean passing through the opposing cartesian coordinates (see diagram above). Drawn above, one looks small and the other big (extra atomic and intra atomic respectively) but from the perspective of the reflection, the view is inverted. This fits nicely with the fact that we seem to be in constant acceleration (who does the work?). We, in our ***matter*** universe, are compacting at very near the speed of light and away from our surrounding electromagnetic radiation and this gives us our mass (just as accelerating an object makes it heavier and heavier, smaller and smaller provided the recession is in 3 dimensions - not just the 1-D shortening shortening of spaceships drawn to illustrate linear SoL recession). Remember, we attribute a direction to photon travel but it does not, itself, see any passage of time from "origin" to "target". So, at the hub there is a figure of 8 flow of incoming electromagnetic radiation (matter to anti-matter and vice versa BUT the return out of the opposite side appears to us to come from our past; and it comes from "our future" for the anti-matter reflection (ie, it looks like the big bang and inflation). Towards the periphery of the discs, as the dominant density interface drops to smaller values it may be that a greater leak "back to nothing, nihil, zilch" is an easier event as less reflection occurs and E-M wave annihilation can occur. The R to 1/R transition may come about through a mirrored reflection (remember the hall of mirrors illusion).

All this is HIGHLY speculative but, to me, it seems to have some attraction and it seems to be knitting together a a series of paradoxes. Perhaps someone will see fit to retain some bits that might be of some value and throw out the dross to make a better conception.

***Here is a video of an up-down elevator***. Imagine that the ***up*** elevator is heading in towards (and through?) the atomic nucleus towards Planck scale distances and the ***down*** elevator is heading out from the electron shell towards deep intergalactic space. Now imagine that at the top, the ***up*** elevator crosses the apex and goes straight down again and likewise the ***down*** elevator started its journey on the opposite side as an ***up*** elevator. At the apex, the away-from-the-electron-shell-entropy transforms into an into-the-nucleus-to-Plank-scale-entropy and vice versa on the other up/down elevator pair. Transforming this into a flat contra-flowing travelator where two people approach each other from opposite ends, they will each initially see the other as small but as they reach the central point, they will be equally sized and then their positioning transforms. Since we seem to be constructed from waves, this analogy might eventually prove to be very useful.

Here is another (highly conjectural) analogy of what may be happening (diagram below). Matter "production" may well be occurring predominantly around the central parts of this "travelator". Remember that it may be that, while vast distances may be felt from the R perspective of things, the 1/R perspective, interpreted from R, is virtually "joined up" - that is, the nucleus of an atom in a keratin scale from your skin "feels" adjacent to the centre of earth, the centre of the sun, the centre of our galaxy's central black hole and the virtual singularity that subtends all of these previous points back to the "big bang". They are all approachable from within the nucleus of the atom. BUT from the 1/R perspective, this perspective is completely inverted. Perhaps this idea of a "one way mirror" across the two peripheral points (1/R communication with R is blocked and vice versa from the inverted perspective) virtually disappears in deep intergalactic space and the two "universe spheres" become - apparently - superimposed. This could be reinterpreted as the annihilation of photons in deep intergalactic space - they can reach it but will not "return" (or reflect). All matter is "painted" close to the joining cartesian coordinates of the R and 1/R spheres. This would mean that photons from every corner of the universe are able to travel all the way from left to right on the top travelator and all the way from right to left on the bottom one: but not vice versa. This annihilation indicates that the top and bottom representatives of deep intergalactic space are themselves "joined up".

Fig 15




Metaphorical escalators (or travelators) can "move" in opposite "directions". Every event on the top escalator can be mirrored in an R to 1/R inversion and also vice versa. Very large structures, the R representatives, may be magnetic fields or magnetic discs that "try" to shrink space back to nothing. Pairs (perhaps mirrored) can be positioned anywhere along the travelator. They become progressively smaller structures as the middle of the travelator is approached (equivalent to the apex of the double escalator). Then they swap over, either contracting or expanding, as they "move" through the nucleus of an atom, through quark size and down to fundamentally small strings – the 1/R representatives. But each point of mutual approach (top/bottom escalator) is a reflection of its R to 1/R partnership and – in its own 3-D environment – the perspective of "who" is big and who is small is inverted. The large scale strings (magnetic field?) may reflect as the fundamentally small strings of string theory.

From this perspective, matter and anti-matter are unzipping apart as a "mirror image" from the multiple joined up "now" points. Ultimately, they reach the limit of the unzip at a black hole/big bang (virtual?) singularity. Note how Quad speakers reproduce a stereo sound stage from two virtual points, one in each speaker. This analogy might prove useful.

I have been imagining that magnetic fields might really be a property of electrical fields set up between "R sized and 1/R sized" pairs. Subsequently I will refer to these as radius-divided-by-the-mean and mean-divided-by-the-radius; or r/m and m/r where r can be anything from close to the mean to over 13 bn LY (usually annotated R). But the sequence may be

1. creation of space by expanding out of nothing
2. a resulting magnetic field that constricts that expanded space and "tries" to lock it up - back to nothing
3. the surface tension of this expanded space (and its resultant magnetic field) may give rise to electric charge.

Let me make an assumption and see later if this is justified. The process of creation and annihilation in quantum foam occurs around the statistical mean (towards which entropy is directed and rises). Anything that is created in the turbulence of quantum foam, and which then occasionally "persists" longer than for yoctoseconds, emerges from the improbable extremes of a probability curve distributed around the mean. Matched pairs of spatial bubbles (r/m and m/r) form around the mean. Their sum always equates to zero and, when they meet, they are able to annihilate each other "back" to nothing. Nothing may, at base, be a virtual singularity - a zero dimensional point that has one important property. It has enough uncertainty that it can never actually "reach" zero - there is an unstable Planckian limit to its smallness (m/R) which is inversely equivalent to the universe's largeness (R/m). That is, ultimately, the limits of size may be R/m and m/R where capital R represents the extreme extent of "bigness" and 1/R the extreme extent of smallness - Planck size. The mean is probably between $10^{-10}$ and $10^{-14}$ metres. So all pairs are created in radius-divided-by-the-mean and mean-divided-by-the-radius pairs that will annihilate when their "fleeting" existences are able to "meet" once again. So, near the mean, the ratio of the pairs generated that are within 4 standard deviations of the mean will be around 1000 to 1 or more. So, if the quantum observation that reality is maintained through constant exchanges with virtual "particles" is extrapolated to this, there will be a "wind" of creation-annihilation that swamps any emergent "persisters" close to the mean. Now the distance from electron shell to nucleus is around this order or magnitude and this may be very relevant to the apparent capacitative barrier that exists between them. Now, if we play with a couple of magnets and bring opposite poles together, we will feel the force that is "trying" to close out the space between these poles - it is roughly a centripetal force (normal to the magnetic field lines).

Now consider the magnetic field around a straight wire; any expansion of the field (into the surrounding "space") generates an electric charge around the sphere of the magnetic field (and vice versa - charge producing an expanding magnetic field). The magnetic field has clear dimensionality but the electric charge may just be a vector force smeared over the approximately spherical surface of the magnetic field lines. And, it should be apparent that - with zero resistance in the wire - this alternation of spatial expansion and contraction will oscillate indefinitely with the magnetic field direction and the electrical charge reversing every 180 degrees. So space itself may be generated out of 180 degree out of phase pairs (2 phase annihilation; perhaps - just perhaps - sets of three or more phases that can annihilate - just like the electric grid - might be possible though, likely, less probable.) And this generation will occur around the mean (sum = zero energy, 100% probability it adds up to zero). So, from the virtual 0-D singularity we can envisage that, first, a 1-D scenario of oscillation occurs then, more recognisably for string theorists, a 2-D membrane from which spatial pairs on the r/m and the m/r sides of the mean blow up bubbles of space. In the extreme, the m/r side will look like tiny "strings" (membranes?) and the r/m side as magnetic fields that encompass the 13.7 bn LY

(plus?) universe. This scenario opens the possibility of a surface tension like effect. Whether it was an attractive or repulsive force that led to this would not affect the effect that an open surface around the margins of the generated space should alter the tension generated around its 3-D (or multi-D) limits. Electromagnetic waves, in this perspective, look like an oscillating pair of spatial bubbles. There could be a pair with a large positronic spatial expansion surrounding a small point charge (the electron). We interpret the positronic spatial expansion as a magnetic field. As these two collapse back to a virtual point they would swap over as they travel through the mean. For occupants of the two sides of the mean, the perspective of who is big and small (the point electric charge) is inverted. This fits nicely with "a packet of energy" and it is possible to take two perspective. This oscillating +ve/-ve charged expansion and collapse of spatial extent may be moving though space or space is moving through the oscillation. Space itself (what we consider 13.7 bn light yrs) may be, itself, part of the largest and most improbable oscillation. The energy of this oscillation consists of just potential energy at the peak of the oscillation (largest spatial expansion) and just kinetic energy at the crossover. Add the two together and we get a repeating theme that the net averaged energy of this dumbell crossover system adds up to zero.

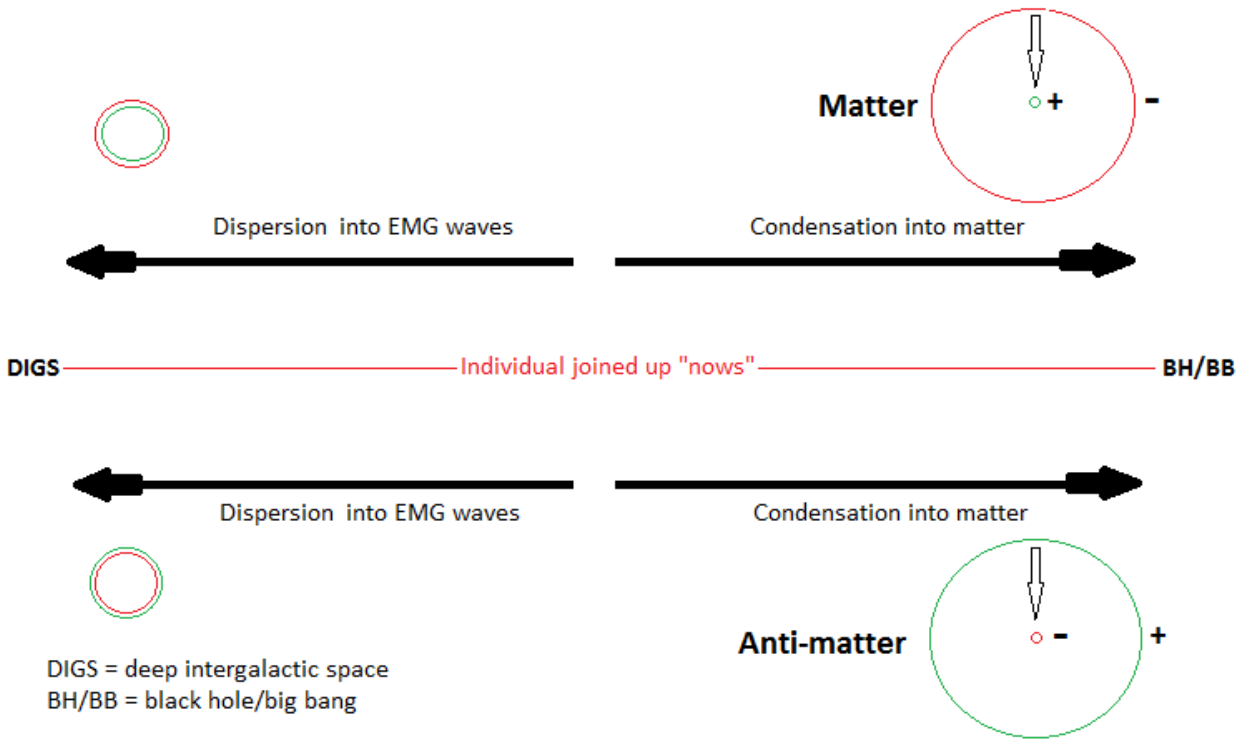
Now that leads on to another conjecture. Where exactly is the universal mean? - the ultimate 1 value that would be indivisible and come in strict quanta. I have already suggested that inside the atom that there is an R/mean to mean/R inversion. Depending on your perspective, the one inside your atom is the 1/R (or mean/R) "universe". We need to think which has primacy - time or space. Is time a product of dimensional winding or is dimensional winding a product of time. Now, short (or even long term) borrowing is the basis of the generation of quantum foam. Spatial extent (1-D to 3-D) may simply be a product of how long the spatial extent has in which to bubble out. The vast majority are very short term loans that can occur in either the T/mean or the mean/T directions.

It is often said that our universe may contain positive and negative energy. We need to remember the close association of energy with an improbably concentrated distribution. Remember that entropy involves (perpetual?) change and that this leads away from concentration towards dispersion and results in both macro- and micro-scopic homogenisation. Gravity, on the other hand, leads from dispersion and initial homogenisation to concentration (or a progressive condensation into multi-D). In this respect, it is a manifestation of an entropy with the opposite polarity to the entropy (an arrow of time) that we usually acknowledge. The other point - which I read recently - is that energy has no direction. Now this might not be "true". Energy wanting to return to the mean by dispersing into deep intergalactic space (ultimately, infra-red photons) has a direction which is away from the nucleus. If we invert this, we have energy that wants to return to the mean in a direction pointing into the nucleus (what we regard as gravity). However, once across the mean, the perspective immediately inverts. So, could the mean actually be the size of the electron shell? Anything that looks (to us) to be smaller that that is actually through the mean and heading off into the mean/R "universe" (but it will see the situation inverted). The electron shell - being right on the mean - will be subject to a torrential creation/annihilation of time borrows that are very close to the mean. Although it might look like one electron, it is in a state of perpetual swapping or virtual for real. This creates, effectively, a Faraday cage "within" which there is no net electric field. Any charge within it can occuy any spot in the "enclosed" sphere. Since the radius is the mean (the 1 of the R/1 and 1/R "universes") the charge density at any one point of the electron shell is charge/$4\pi r^2$ . The charge density inside this sphere is charge/$^4/_3\pi r^3$ OR, rearranging 3 charges/$4\pi r^3$ . Since the radius in both instances is one, $r^2 = r^3$ . So we need 3 (fundamental) quantal charges inside the "Faraday" cage to balance one fundamental quantal charge around the surface of this cage. The actual charge inside is perfectly balanced with the outside charge. Of course, the perspective is inverted from the other side. Now, this is tortuous and quite likely nonsense but - perhaps - just maybe? If we think of this perspective inversion occurring around the mean "plane" that cuts through the torus mentioned earlier, matter will form in the torrent of created/annihilated quantum foam temporally close to this plane. Rather than time being some illusion of distance, distance may actually be some illusion of time (about the mean in a T/mean and mean/T pattern around a virtual point of zero time).

Following on from the earlier videos of how our universe may be "formed" in torus fashion, this video highlights what I think is a wrong interpretation. Watching this video we see the galaxies being spewed out of the funnel of the torus, cycling around the periphery and then being swallowed up on the opposite side. However, these largest "strings" are the "opening" out of (deep intergalactic) space and are the place where true annihilation of energy can occur (the repayment of borrowed energy/time)- the zero energy point. All that exists here is the uncertainty that spawns quantum foam and the occasional persisters that form stable fempto-capacitors that emerge into stable atoms (like the diesel + oxygen analogy of two closed entropic systems) and then more complex matter. We (in the spiral arm of our galaxy) are well into the neck of this funnel and will ***never emerge*** (as intact molecules) from this. This is our existential standing wave condition. If we imagine a contra rotating flow of photons or other waves, outward from the neck of our funnel and inward from the periphery of the torus, then we are probably persistent, standing waves that are forced into a morphostatic technique to maintain order (even though that order is constantly under attack by the relentless fempto-scopic jitteriness imposed by entropy). From the perspective of the inward (photonic?) waves from deep intergalactic space, we are accelerating out at nearly the speed of light (hence light always "travels" at the speed

of light). The "bending" of light by the sun's gravity can be, equally, explained as the accelerating expansion of the earth during that interval that light takes to travel from beside the sun to the earth. Gravity, then, by this perspective, is not an attractive force but the literal (from a photon's perspective) expanding invasion of the photon's space by matter.

Here is yet another view that may help in appreciating possibilities.




How it could be made up. "Time" will have the same apparent "direction" for both matter and anti-matter. We should interpret right hand sided elements (towards condensation) as residents of the "past" and any left sided elements as resident of the "future". The rings represent atomic make up AND universal make up. The outer rings (the electron shell) can see the positive ring from only one direction. If it could be seen from the other direction then it would be seen as an enormous magnetic field. The density of matter near the BH/BB horizon ensures a rectifying one way view.

Fig 16

The density of condensation (from one partner's view to the other - and that will invert across the "now" membrane) ensures a one way travel of electromagnetic waves. We should not be able to see anything (photonically) "shining" out from the nuclear "virtual singularity". The "wind" of fairly "equal" spatial-sphere-pairs (4 standard deviations around 10,000 to 1) should vastly outnumber the rarer unequal spatial-sphere-pairs. They are not unequal in probability (and thus energy). Because rarer pairs are much more "energetic" (far more improbable) this imbalance of mutual perspective grows and the now barrier gets more extreme.

If we go back to the idea that there is a perspective change at the top of the double escalators (or centre of the travelators) it is important to look at what is happening as we "travel" through the mean (where the perspective inversion should occur). Think of an atom and what will happen to perspective as we "travel" into it. We start off - on our matter side - with the large magnetic field ("string") on the outside and the small (electron?) string on the inside. The moment we look from the perspective of the "inside" of the electron sphere the perspective inverts and the small string becomes the large magnetic field and the large magnetic field becomes the small string. Matter changes into anti-matter BUT the wind of quasi-equal pairs that are being created and annihilated between the two may have an influence on keeping the just-in-the-past elements and the just-in-the-future elements apart and prevent them from annihilating.

Here is another set of thoughts: if we strip away all but the largest (and its reciprocal, smallest, dumbbell-pair partner) it might be possible to get a clearer view of what is happening. For the moment, assume these "add-up-to-nothing" dumbbell pairs act like pure sine waves (remember the analogy with the opposing faces of dice that can always add up to zero - in the entropy section). As the spatial "dumbbells" oscillate through the mean there will be a maximum amplitude (biggest vs smallest - but that perspective changes through the mean so the smallest appears to suddenly "inflate", through the mean, into the biggest: and vice versa). At the maximum amplitude, on each side, all that

particular side's "motion" is converted to potential energy. As we approach the mean (minimum amplitude), all the potential energy is converted into kinetic energy (just like pendular or spring-like oscillations). So that means that the the largest oscillation sets the maximum "speed" through the mean (the SoL?). Now lets add a few smaller, component oscillators and imagine them as springs that can stretch enormously (to almost straight) then contract back to coiled and - one further point - all the coils can pass unobstructed by their own rings through the mean so that the spring "inverts". So we now have springs that unwind into maximum tension at the largest amplitude of oscillating (maximal) space and concertina (wind up) at the smallest (the mean). Now the whole process can be vastly complicated by adding in a myriad subsidiary extra "springs" that become the fabric of the standing waves of our (visible/tangible) cosmos. This means that - if the standing waves are "built" close to the mean - matter is represented in that portion of the largest amplitude sine wave that is, at that point, all kinetic and little potential energy: it is "travelling" at the maximum velocity. Space is contracting at its maximal velocity and we - on earth - are standing "still" by virtue of our rotational acceleration (spiral arm, planetary). Now, we know from Einstein's relativity that, if something is moving to or away from you at the speed of light, we perceive that it becomes shortened and its time slows to a standstill. If the acceleration is into the mean, contraction to electron shell size and then expansion out the other side of the sine wave, then it is ***contracting*** at the speed of light in all three dimensions. So, not only is it shortening in one direction, it is contracting in all three - become increasingly point like. We also know, from Einstein, that the question of who's time and dimensions are shortening depends on which perspective you take (which "space ship" you happen to be travelling in) and this shortening only becomes "real" if one side moves suddenly into the others domain (eg, muons slamming into the earth).

One inevitable conclusion to all this is that time will appear to be very different on the two sides. On "our side" there appears to be one single maximal (age of the universe or more) dumbbell expansion. But we can "see" or "feel" the influence of the other side and this appears to consist of countless minimal spatial oscillations - not just one. This perspective is reversed on the other side. So, here is an early feel for "multiverses" and the first indication that this dumbell structure could be the generator of a Darwinian style emergence of persistent matter. We can also imagine that, with countless subsidiary spatial-dumbell-pairs, there is the potential for a maelstrom of turbulent chaos near the mean and a bland sameness and calm at the periphery. Also, the tension - like surface tension - is around the spatial expansion which results in a net force towards the (electron shell) mean. A question that remains is how we end up with a 3-D universe rather than a 2-D universe but that may be part of the emergence or it requires expanding the dimensions to three from the 2-D surface of a time/distance sphere (as in the diagram above). Remember, the oscillations are ***NOT*** forward in time but back and forth in time. The stable emergence occurs in mirror image fashion either side of the mean (one "forward" and one "backward" in time - or should I say one "forward" and one "backward" in entropy direction).

***VERY preliminary thoughts (here to the end):*** All this implies that the mean needs to be a geometric mean - not an arithmetic mean. The geometric mean of two numbers, say $10^{+35}$ and $10^{-35}$, is the square root of ($10^{+35}$ x $10^{-35}$) which is $10^{0}$ or, put more simply, 1 (this range was chosen to be around the universe's ball park). Don't forget that anything below $10^{0}$ and continuing to as low as $10^{-35}$ would "see" things inverted - it would perceive there to be "expansion" not "contraction" in going from $10^{0}$ to $10^{-35}$. There are a number of good reasons why it should be a geometric mean. There is no value of zero in the range (there is very big and very small but no zero value and the inversion dictates that there is a minimum size). Energy is an improbably concentrated distribution of values that are at least several standard distributions outside the mean. Energy in kinetic form is represented by $^{1}/_{2}mv^{2}$ and in mass form by $mc^{2}$ (Einstein). The potential form of the energy of an object which is at "infinity" from a gravitationally attractive body is equal to the kinetic energy it accumulates in moving from "infinity" to the attractor. In book by Brian Cox and Jeff Foreshaw (pp 74-101 - it's a useful place to be introduced to the concept), they establish the relationship between time and space (distance) but take its square root. However, if it represents energy then it is possibly better to leave the equations in the squared state. This leads to their diagram where there is a no-go area (Minkowski space) of energy transfer set around a virtual point (values are always shy of this virtual point). These observations point towards a unitary minimum when values either side of the mean never drop below "one unit" but simply invert by their power of ten becoming its reciprocal (so the range $10^{+35}$ to $10^{-35}$ becomes, at transition, $10^{-35}$ to $10^{+35}$ and the perspective of who's power is inverted depends upon which side of the mean you view it from. Interestingly, that puts a slightly different perspective on the role of the imaginary number $\sqrt{(-1)}$, usually called "i", which turns up in electrical calculations of capacitor/inductor circuits (where the convention is to call it "j" rather than "i"). This may only be real (and meaningful) if we consider it as a manifestation of a transition from "positive" to "negative" energy; it might be that it is our conviction that we need to reduce it to its "roots" that may be the imaginary entity rather than the imaginary number "j" itself. And all this may, anyway, be a reflection of statistical variance which is also calculated with squared values. Pythagorus gives us

$(\text{adjacent})^{2} + (\text{opposite})^{2} = (\text{hypotenuse})^{2}$

or

$x^2 + y^2 = z^2$

and that can be rearranged into

$y^2 = z^2 - x^2$

Which is the form of their equation and that might challenge which value represents the "true" hypotenuse. The "distance" between two "events" may actually need to "adjust" to this inversion across the mean. Time is, arguably, the direct outcome of the inversion of distance into time across the mean - as we go from external to internal space. So time is a direct function of $^1/_{distance}$ once we cross the mean. The earlier analogy of balanced "dice" face pairs suggests energy is created in matched pairs or positive and negative energy amplitude across the inner and outer atomic space (inner and outer depending on "your" perspective). Photons are likely to be made up of a balanced pair that oscillates around the mean. Both maximal amplitudes (inner and outer space) can be measured in terms of either time or distance

$^c/_t$ or simply d

since, when using a laser-distance-measuring-device,

$d = {}^c/_t$

So, (external space) = (internal space)$^{-1}$ for these matched, net zero energy, pairs. And it is arguable that time is directly proportional to the reciprocal of distance. As the local concentration of internal space in external space increases (gathering into planets, suns, black holes), so the mass action effect of proximal internal space is progressively interpreted by us as a slowing of time (and, for that matter, mass).

So, the diagram on page of the Cox/Foreshaw book is starting to look very much like the double asymptote diagram (above) but rotated through 45 degrees. If we call the left hand side N(orth), the right S, the top E and the bottom W, I wonder if the N to S axis is across the central funnel of the torus (above) and the "intrusions" of the E and W curves might just possibly result in reflection by extreme refraction. That could satisfy the outcome of a no-go area in the centre. This is hyper conjectural. Looped strings of spatial expansion, which become charged, may become what we interpret as electrons and positrons when "seen" from the $^{mean}/_R$ perspective (this reciprocal perspective would explain why they appear far smaller than the electron shell).

So, let's return to the idea that the past can be just a millimetre away and yet, in effort distance, it might as well be on the other side of the universe. As we dive through the R/mean into the mean/R point, this represents a funnel - like the wormhole diagram above. The funnel diameter is set - in this scheme - to be at around (if not actually) the diameter of an electron cloud around an atom. In our matter universe (we see it as an R/mean construction) the direction of time is set by the highly improbable compaction of matter to the very probable homogenisation to fill all our universe's space (the large majority deep intergalactic space). I'll call our side the North side and the anti-universe "reflection" the South side and that is probably in keeping with the "magnetic" field that the "surface tension" of expanding outer and contracting inner space produces through becoming "electrically" charged (or we can call it expanding North space and, by its perspective, expanding South space - or explained more fully - the matter side sees expanding North space and contracting South space and the South side expanding South space and contracting North space). An electron will be our view of expanding South space. So, on the North side, the direction of entropy is forward in our time whilst on the South side, the direction of entropy is in the opposite direction. North is now to future; South is now to past. It is like an very small ring is moving along a pair of figure of eight looped strings (which add up to nothing and oscillate North to South and vice versa), but there are miriads of these string loops and and miriad constriction points. But the constriction points are "converging" on (or subtended back towards) a virtual "point". All time is probably produced by an oscillation of spatial R/mean + mean/R pairs. Sustained 1900 to 2000 time is a manifestation of the apparent slowness of our outer space (North space) oscillation. This may be an illusion of our counter acceleration (mostly by rotation) just "above" the sine wave crossover, where the energy of the wave is kinetic rather than potential. The South side, of course, will lie just "below" the opposite side of the crossover. Could we be getting an outer space view of oscillation that is end on, like looking at a spring from one end when it will look just like a circle? The North's view of the South would be a tiny oscillation strung out across contracting space and so will look like an oscillating wave rather than a static (but oscillating) mean/R spatial incursion. Now we can envision a scenario where quantum foam is generated across the disc that separates North from South in the torus (we may have to view it as 4-D with our 3-D

conceptualisation adapted for a paper representation - like the earlier diagram of an expanding spatial sphere around a time radius). I suspect this 4th dimension might be "ironed" out by reconsidering the effect of the R/mean to mean/R inversion and the fact that it is a geometric, not an arithmetic mean. The time radius may simply reflect the fact that one of our dimensions is trading R/mean for mean/R directionality (or two are trading it and one not - think thru). This is why galaxy discs, where there is substantial rotation, tend to be flat. (The fatter galaxies or parts of them might have lower rotational energy?) This end-on-view of the "spring" could mean that the North's view of outer space will perceive very few oscillations whilst it will perceive countless oscillations in its view of inner space which is the North's view of the South side.

Wikipedia's article on Minkowski space has this diagram.

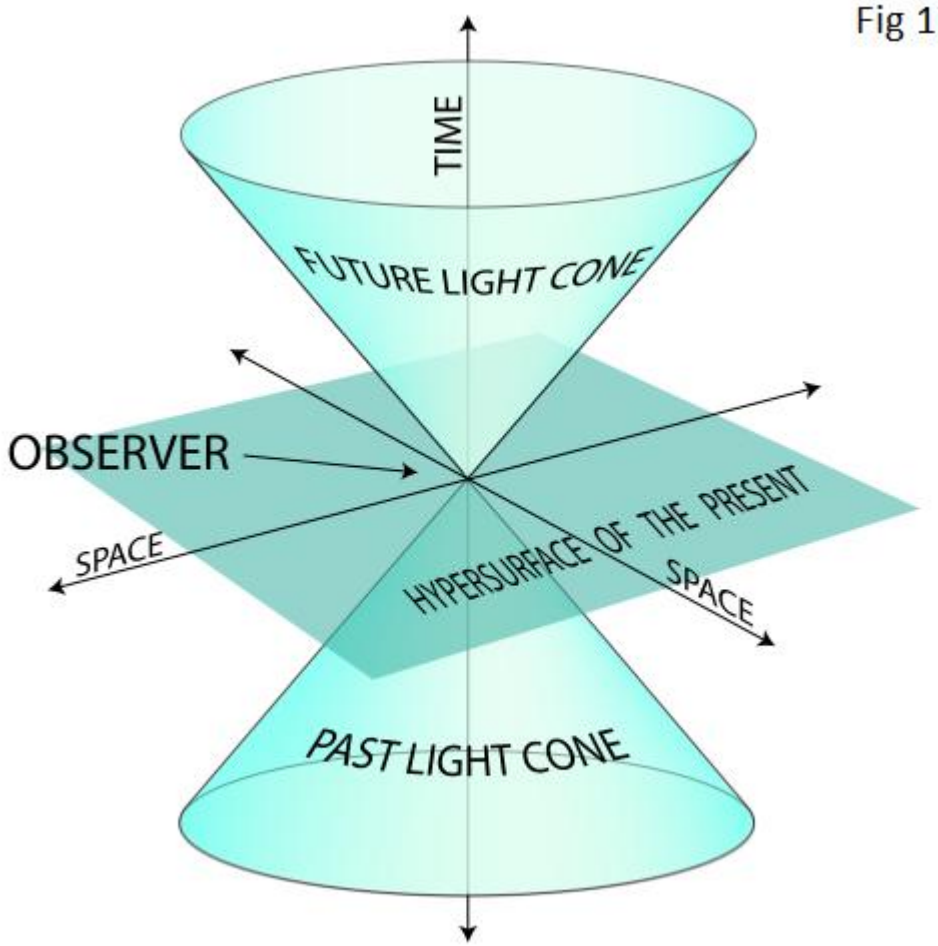



Fig 17

Now, this is looking pretty much similar to some of the points made above. One important point about slipping through from the matter to antimatter state (electron charge outside the atom = matter and positron charge outside the atom = antimatter) is that the direction of entropy flips immediately. In both universes, photons dissipate energy throughout space (the vast majority going to deep intergalactic space because that is the overwhelmingly dominant state). Remember these cones only represent two of the three spatial dimensions (not just the two that this simplified diagram presents). Logic would suggest that these two expanding footballs ultimately expand until at maximum amplitude, the upward and downward entropy flows merge together in deep intergalactic space. Matter can only persist where rotational acceleration exactly counterbalances the natural accelerating collapse of space towards atoms, planets, stars, galactic centres and by Einsteinian definition it is in this matter state because it is accelerating at close to the speed of light (remember the sine wave thing - virtual no momentum at maximum amplitude of spatial expansion and virtually no amplitude at maximum momentum of spatial collapse. So, it remains very close to the mean (sine wave energy above the mean is exactly equal to that below; it adds up to zero).

Every atom is a tiny window into half the energy of the universe, and it feels its influence. The more compact we pack atoms, the greater the mass action effect of the accumulating windows into the other half of the universe (across the torus). Although the mean/R perspective would see vast universal distances, we only perceive the "anti"verse (or the South Universe) by its influence exerted through the tunnel of one or very many more electron; and it apears to be tinier than an atom. So gravity IS the effect of reversing entropy. We experience it because it is pack up inside an atom. And when there are many atoms packed close together, its influence grows massively. Effectively, the insides of an atoms are trying to evaporate away towards deep intergalactic space on the mean/R universe.

The graphs below highlight points about this Minkowski space - that bit around the tips of the two cones. If it were possible to have a zero value at the cone tip $\pm[\sqrt{(x^2+0)}]$ then there would not be any "no-go" areas and no big barrier to the immediate past. (Needs thinking thru.)

Remember, the contention is that an "inhabitant" of the "North-side" of the torus sees the "South-side" in a mean/R configuration. On the other hand, an "inhabitant" of the "South-side" of the torus sees the "North-side" to be in the mean/R configuration.

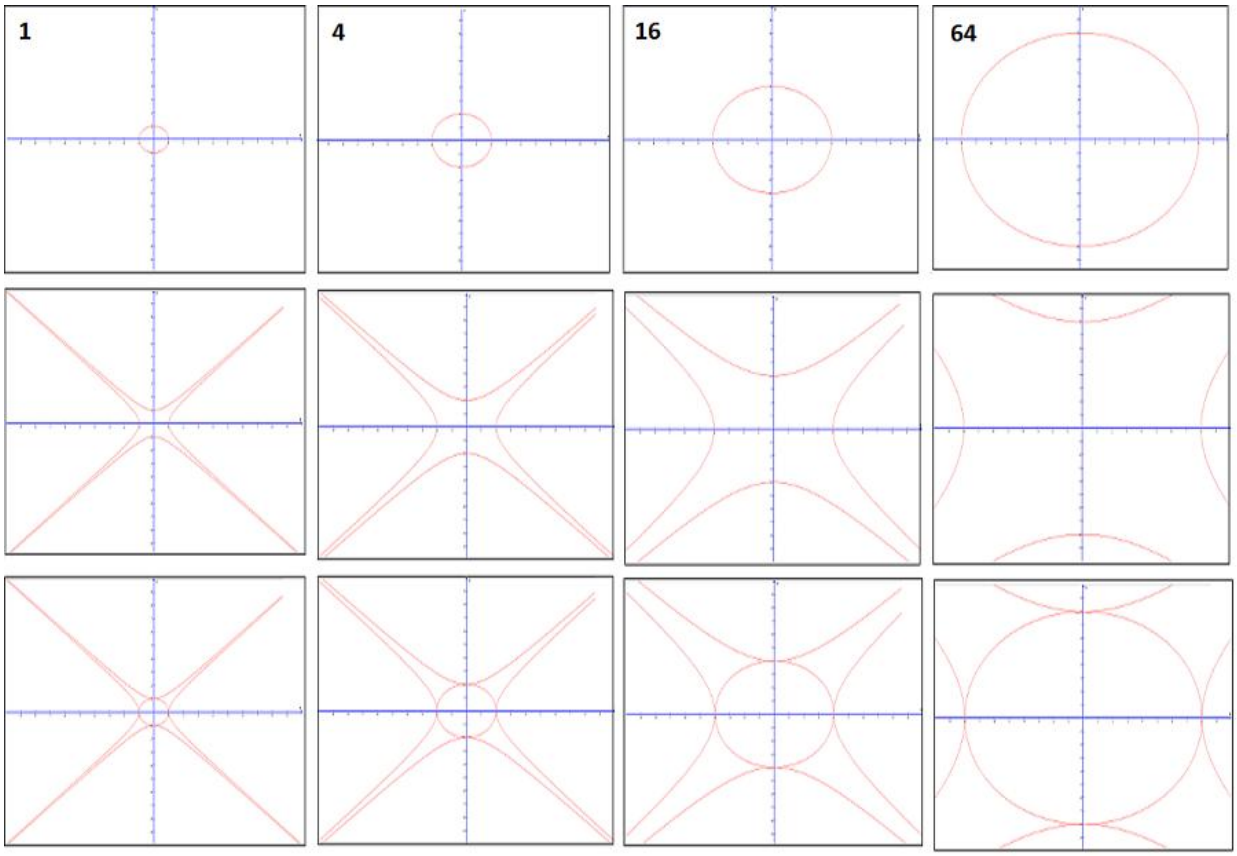



Fig 18

**Minkowski space** - row 1, column 1 is an enclosed circle [$\sqrt{(-x^2+1}$ which equates to ($y^2+x^2=1$)]: row 2, column 1 is Minkowski space [$\sqrt{(x^2\pm1)}$]. If the smallest the circle radius can be is one - a quantum whole number mimimum - then this would equate with the minimum diameter through the funnel of the torus. Row 3 they are combined. Columns2 – 4 show increasing $y^2$ values of the expression, eg, row 2 is [$\sqrt{(-x^2+4)}$] a circle with radius 2.

A conundrum to resolve is how these two sides swap over - or do they bounce/reflect? Is it a form of quantum tunnelling? The crossover is a problem. How does the R/mean to mean/R take place and over what "distance" or "sphere of influence"? How does the sudden change to 1/3rds get explained away with the appearance of quarks "on the other side" (I have already suggested a high degree of symmetry that this ugly fact leaves looking "awkward"). The answer - probably - is that there is no crossover, just spherical contraction then expansion about the "now" point. If the idea proves well founded, that it is some sort of surface tension that leads to electrical charge, then this suggests that the multidimensional dance that begets "matter" is taking place by intereactions of the surfaces of multiple expanding contracting spatial "spheres". Then, the importance of the circles within the Minkowski space (bottom row) gains extra significance. Perhaps matter standing waves "bounce" at the electron shell boundary between "positive-North-entropy" and "negative-South-entropy". It is already "deemed" that a neutron is - effectively - a proton in combination with an electron so the extension to quarks and positrons seems natural - but how? One further observation is this: the R/mean to mean/R transition may act rather (but not exactly) like a right angle. As we approach on the R/mean side, we get closer then suddenly no closer but progressively further away - which is rather like what happens as we approach the "opposite" from the "adjacent" side of a triangle. So that might influence the maths.

De-Sitter spacetime is an extension of Minkowski spacetime where there is no "fall" to an infinitesimal singularity. These diagrams (below) are taken from this paper and show how two spheres "interconnect". However, it is important to remember that these are 2-D representations (expanding "cone") of a 3-D universe. The upper and lower poles are "occurring" in the same space but their entropies are reversed top to bottom. It is only at large distances from the "funnel" that the two entropies become saturated and, thus, easily miscible. The points just above and just below the funnel are an immense "effort-distance" apart and therefore do not - at this proximity - homogenise back to nihil/zilch. (First diagram De-Sitter space, second Hyperbolic space.)

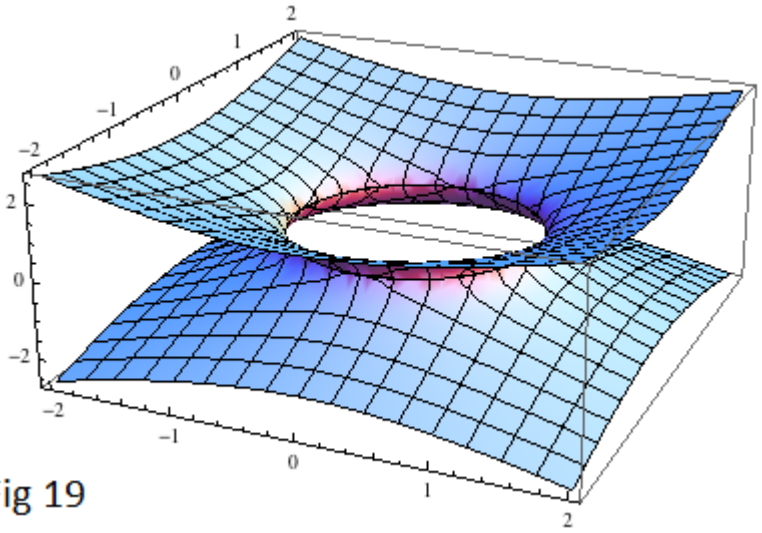


Fig 19

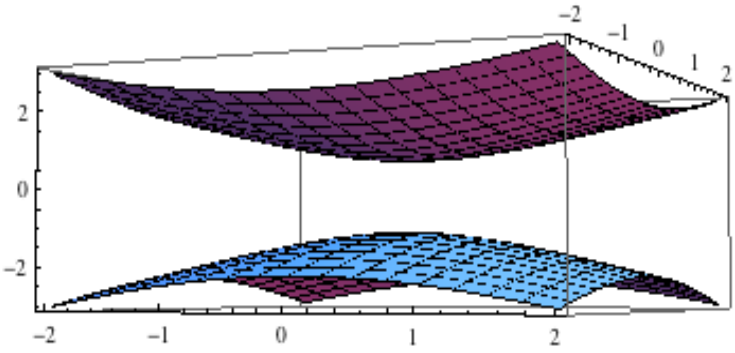


Fig 20

This is rather nice, because, we can imagine dropping a coin into one of those vortices that collect money for charity. This is rather like what may happen in an electron shell. At the periphery, not much holds up the travel towards the hole. Indeed, if the travel to the hole is "perpendicular", it (a photonic wave) goes straight in. But any degree of deviance from the perpendicular will amplify as the hole is approached and it will hold up the coin's disappearance. This might be exactly equivalent to what is happening as atoms are formed and what gives them "persistence". The top sphere and bottom sphere are, effectively, superimposed but their opposite entropies prevent annihilation occurring at this place.

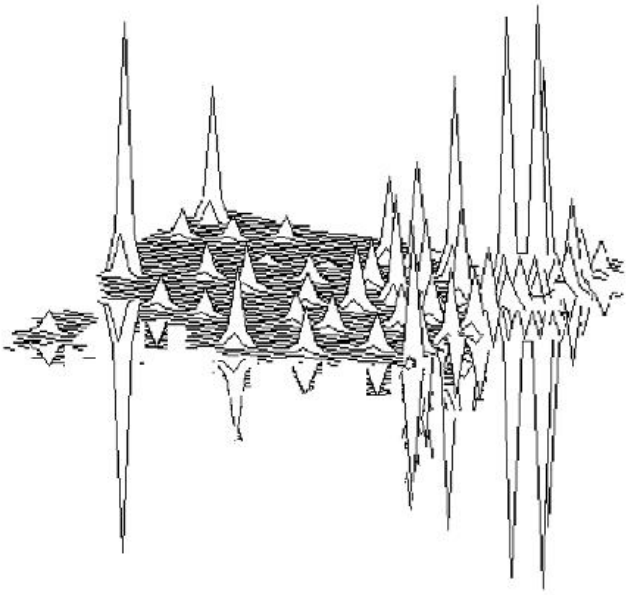
I have added a link to a new figure here on prime numbers. Primes are, by definition, are fundamental and non-harmonic. They can be part of a harmonic if in multiple instances (eg, 13+13 = 26) but are fundamental on their own. Quantum physics seems to suggest a pervasive exclusion principle that suggests that the population of new "possibilities" is restricted to unique components. When we graph the distribution of intervals between successive primes we end up with a histogram that is very reminiscent of a Minkowski like distribution.

The following perspective might have some value: if this view of a "mean" set about the "diameter" of an inner electron shell proves correct, then it offers a fresh view. You have possibly seen, even looked through, those multiple pinhole focusers that ophthalmologists and hospital ophthalmic departments use. Well, this may well prove a useful analogy that helps us to look through a "now membrane" to escape the straightjacket of time. Every atom is like a pinhole allowing us to "see" through from the North side of the torus to the Southside. It may act like a diffraction grating with the wave functions of either side instantly able to interact with each other, through the tunnel. On emergence from the tunnel (on either side) the wavefunction can then resume its expanding wave front as it spreads out into deep intergalactic space. We need to adapt the analogy to encompass the idea that these pinholes emerge, like wormholes, through multiple locations in both "time" and space. I think there is possibly some value in this analogy, particularly in perceiving how we can get an apparent right angle from the R/mean to mean/R transition and why the perspective is inverted either side of the mean (R/mean becomes mean/R and vice versa).

So, we ***could*** have a situation where baryonic matter and baryonic anti-matter are separated by "effort distance" (effectively similar to spacetime) but not by "distance" (remember, the past can be femptometres away but "a universe of effort" apart). To bring some analogy to this, think of a mirrored, spiky surface covering the inner "substance" of a sphere. Or, alternatively, a combined real and mirrored image of coniferous trees in a lake. The lake surface represents the surface of a (merged - see Entropy and this section) big bang/black hole singularity. At the tips of the tree branches, with their pine "needles", are the countless individual atoms. (The tips of the spikes on the ball represent a point where a mirror image of the ball is occupied by the same point at its centre but now the reflection is like a

ghosted superposition of similarly shaped spikes in the same place but at opposite "time" poles - or "entropy poles".) Each electron shell of the countless atoms, are approached and exited at the SoL, and can - once inside the substance of the tree (spike ball) and its reflection - slip to the opposite (reflected) side (virtually?) instantaneously. So, whenever we are measuring/assessing the SoL we are seeing it enter or exit electron shells at the same standard speed (because it lies at the mean of the sine wave). In deep intergalactic space, the net energy of the universe is near enough zero but a little bit has been borrowed to form a perfectly balanced (to zero energy - zero improbability) "gravitated matter" in a perfect and mirrored balance of "positive" and "negative" energy (effectively mirrored entropy gradients that are both "headed" back towards conditions typical of deep intergalactic space) and these form persistent and relatively time stable matter. "Time" condenses out of nothing (timelessness) from quantum foam and does so symmetrically around a virtual singularity who's "diameter" will never be less than that of an electron shell. Now that takes us back to the idea that virtually all incident photons will arrive at the surface of the singularity at a finite angle (not a perfect normal to the singularity "surface") and, thus, be reflected back because the density here is subtending to "infinitely dense". So distance separation has been traded into time separation (in the mirrored matter state) and we perceive the effort distance of their separation to be immense. ***Perhaps these simplistic notions could be enhanced to something useful.***

Fig 21



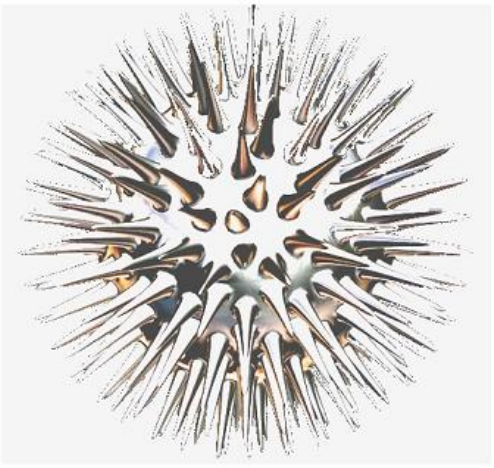
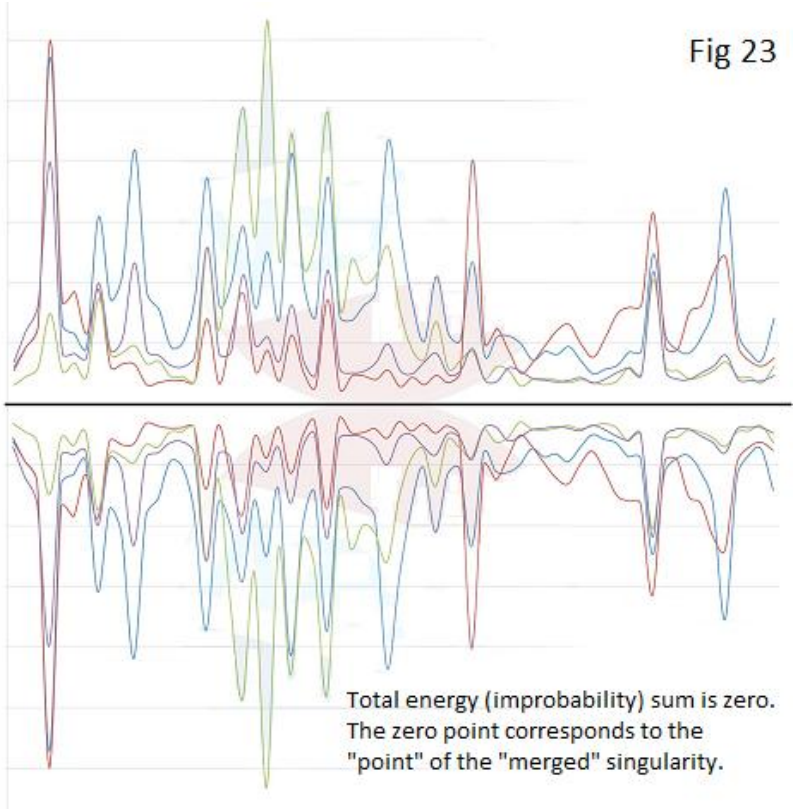


Fig 22




In all this, R/mean is perceived as our conventional perspective of distance and mean/R is perceived dominantly as as our perspective of time. This is easy to see because, with any oscillating clock (ALL clocks oscillate in one way or another) we are trying to waggle a whole universe backward and forward when we waggle an atom. For single atoms the distance of the rest of the South-side is remote but, when we pack more and more atoms into a confined space, multiples local windows should make this oscillatory inertia more and more influential in the local area. Thus, the passage of time will appear to slow.

The big bang is now more clearly seen as a "bounce" through the torus and inflation as the consequence of negative-South-side entropy working its way through. I suspect that the maths for inflation could prove to be similar but the metaphor attributed to it different.

All this is still awkward and embryonic in conception: it ***will*** change or even be abandoned where I realise it really is nonsense.

One advantage of the idea that the inner and outer universe (perspective reversed for each member universe) pivots around the "electron shell" diameter is that, in sine wave fashion, flows through the pivot point reach a maximum for the most common wavelength (very long) and, so, they enter towards the pivot at the SoL and emerge at the SoL. So any device checking the SoL will see it as a maximum constant. We tend to think of it as a flow **past** us whereas it may be a flow into and out of us (us being our constituent atoms).

# Points to be integrated into the text later:

The view I am developing is this: for photons, time is pretty meaningless. They just "are". Like the "wavefunction" they have a ubiquitous presence that permeates throughout all of space with "no respect" for time or distance. For them, the distance across the universe is miniscule, there is no "passage of time" for them. In deep intergalactic space, they are the dominating presence. In deep intergalactic space they sum up to zero energy through interference. It is only when matter evolves through chance high energy accumulations (highly improbability concentrations that "derive" from the fundamental uncertainty principle) that time and persistence appear to become important. Time is "crafted" out of deeper and deeper wells of "a progressive slowing of the passage of time". However, this time is in a perfect balance of matter wells and antimatter wells. The reason that they do not annihilate (remember the matter capacitor) is that these time/matter wells lead to larger and larger half-lives of the particles concerned. At the statistical "mean" that separates matter from antimatter (-ve atom shell entropy from +ve atom shell entropy) there is an inversion of "perspective". The atomic nucleus is a manifestation of our "view" of the reciprocal antimatter universe contained within the electron shells of matter (and vice versa). Time is a manifestation of "how far" things are away

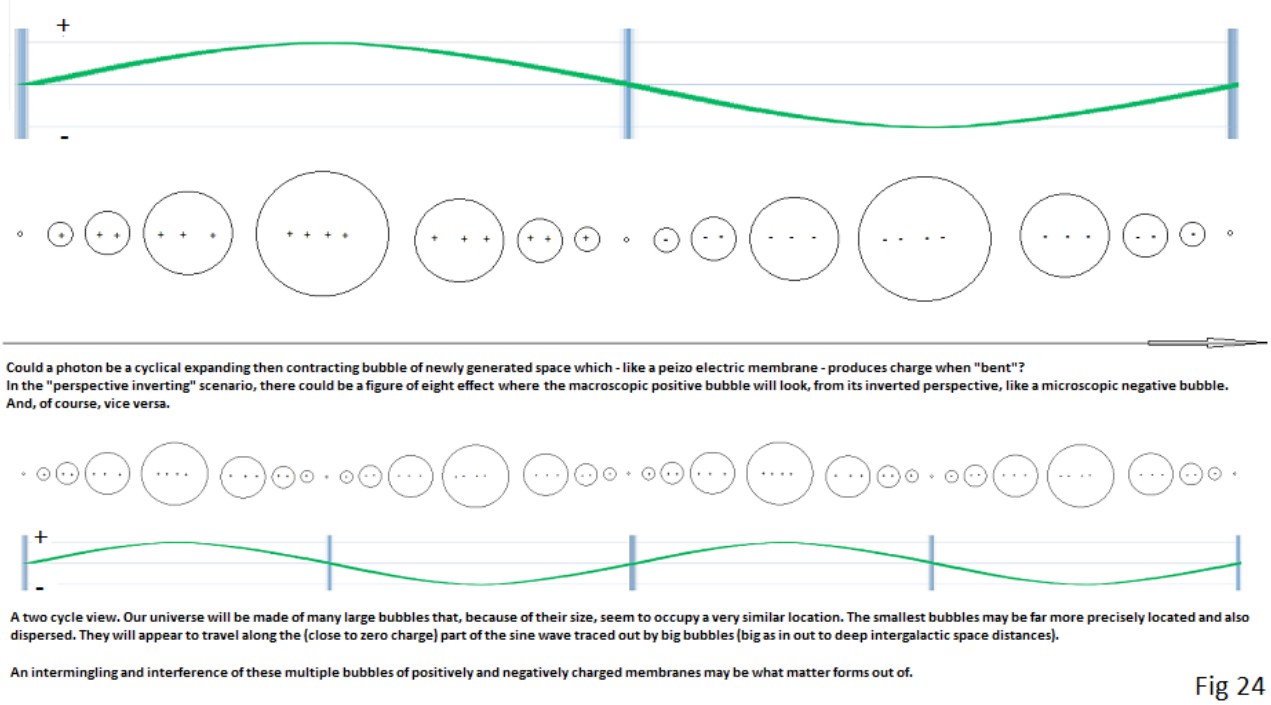
from each other, **within** the nucleus, from the antimatter-side perspective. The view from the antimatter side is that the distances of a positron-entropy dominated universe are huge but from an electron-entropy dominated universe they appear to be contained within a nucleus. How is this possible? Well, that earlier argument, that the passage time "slows" massively at an event horizon, comes to the rescue. The distance, from the event horizon of our galaxy's black hole to the event horizon of the assumed "big bang", should be much, much smaller (infinitessimally?) at the event horizon, than the 13.7 BnLY that we perceive from our perspective in the proximity of Mother Earth. General relativity seems to permit some sort of wormhole (time portal). All matter is a balanced condensation of electron-positron-pair derived improbabilities that form condensing time-slowing wells in an otherwise timeless photonic universe. Partial time wormholes are probably a manifestation of every atom in the universe, and they "join up" linking atoms to rocks to asteroids to planets to suns to galaxies and to event horizons till all "project" back to one "virtual(?) big bang event". This big bang "event" will be very different to the popular "unimaginably big explosion" interpretation. Within the "wormhole" created within electron (or positron) foci, the transition from a 2-D enveloping membrane to a 3-D (or more) "universe within a nucleus" (which, of course, is a perspective that is completely inverted for a positron dominated universe) results in apparently different physical properties of the balancing positronic shells "within" the nucleus of an atom. (This could, perhaps, work but I can't imagine exactly how at the moment.) However, this "immediate" intra-nuclear structure is a property of the "wormhole" between matter and anti-matter dominated universes. Every atom in our bodies is, through its own "electron-shell-enclosed-wormhole" incredibly "close" (that is, it is in high capacitance with) its antimatter mirror. The "structures in both decay (half-lives again - a consequence of the time-well) but one through matter domination, via photons and progressive red shifts, to deep intergalactic space and the other, at the other end of the (toroid?) wormhole, through antimatter domination, via photons and progressive red shifts, to the same deep intergalactic space. At this point they "meet" and sum up to absolutely "zero". It is the creation of condensing "time-wells" that allows the "progressive" evolution (emergence) of an apparent event as unimaginably improbable as the (virtual) "big bang". This general view has, possibly, some merits that may commend pursuit and refinement.

## Points about "time"

- Time wells: the time well that leads "back" to the "big bang" singularity appears to us to be about 13.8 bn yrs deep.
- The "now" of deep intergalactic space may represent a standard "timeless now" (travelling photons do not feel constrained by time - for them the universe can be crossed instantly and its distances are miniscule).
- As electromagnetic waves form into matter, this results in a dive into a time-slowing-well ( I suspect in a balanced matter antimatter symmetry).
- The "matter universe" is "felt" through electron repulsion as electron shells move close together. The "antimatter universe" is "felt" as positron shells move close together.
- For those habiting a matter parish, the antimatter parish remains "invisible" and vice versa.
- The deepest parts of these time wells are where matter capacitors can become most condensed (going into 9 or more dimensions).
- Matter capacitors are made up out of balanced (remember the top and bottom dice face analogy) spatial bubbles. A positively charged bubble is balanced by an entangled negatively charged bubble. Each sees its counterpart's unravelled dimensions to be shrunk to almost Planck length (receding - radially inwards - from each other at the SoL).
- The outer skin of the -ve bubble is incredibly close to the outer skin of the +ve bubble but they are, in terms of "effort-distance", a universe apart when attempting to cross against the "diode" barrier from electronic shell to positronic shell. Charge can only be neutralised by going one way - towards the deep intergalactic space homogenisation that finally repatriates "energy from nothing" (true annihilation).
- Light (a photon) is a travelling expanding then contracting bubble of spatial "intrusion" which is first positively charged around the spatial membrane and then negatively charged around it. It is an oscillating expanding contracting bubble who's net energy would be zero if this perpetual oscillation where to be perfectly balanced (needs thought around this "explanation").
- The matter-capacitor "fails" (current flows) when the "primordial singularity" reaches below electron shell "size".
- This failure can occur bit by bit under extreme conditions (atomic explosions etc where mass is "annihilated"). The vigorous oscillation of high temperatures can "knock" positrons into the electron dominated universe and lead to a release of photons into deep intergalactic space.
- Indeed, the gradual failure of the matter capacitors may occur in a "cog by cog" integer like way around the mean.
- However, it will start to breakdown in a wholesale fashion **before** the timewell reaches a zero size singularity. The inflationary period is a, perhaps, a consequence of a virtual reflection of the antiverse (positronic) universe. An electron become a positron in exchange for a positron becoming an electron and we get an illusion of an electron jumping instantly from one energy state to another. Inflation assumes that time extends all the way back to a zero sized singularity rather than this point being a "virtual-singularity".
- So we can already glimpse the inflation process. Electrons appear to change energy levels instantly - they are not

held up by the SoL. As an oscillating pair of electrons oscillate in figure of 8 fashion across the mean, they appear as electrons on the universe side and positrons on the antiverse side.

- So, as we approach electron orbits we see a coglike mechansism of progressive compactification.
- Down to the inner electron shell, it just looks like electrons but then these "convert" to positrons in an antimatter entropic universe. Seen from our side, these positrons appear to be atomic nuclei with protons and neutrons. This tunnelling through goes cog like - integer bit by integer bit.
- Seen from the matter-extra-electron-shell, It may look like the balancing charges are $^{2}/_{3}$ or $^{1}/_{3}$ of an electron but this may be a consequence of charge being spread around the area of an electron shell ($4\pi r^2$) whilst the positronic universe is glimpsed on the other side the electron shell "wormhole" and appears to be condensed within the volume of a nucleus (charge spread through $^{4}/_{3}\pi r^{3)}$ with the ratio being $^{1}/_{3}r$. At a unitary distance (nothing can, in effect, be less) would become $^{1}/_{3} \times 1$ which is $^{1}/_{3}$.
- This would neatly change gravity into an electron charge effect. But now, as we try to waggle the electron shell, we are trying to waggle a whole universe "inside it" (from our perspective) and it has a distant - and thus very small - electromagnetic effect of the distant antimatter world - which to us, and at its virtual "closest", look like the very small nuclear particles of quarks. Perhaps this might be worth pursuing.




Could a photon be a cyclical expanding then contracting bubble of newly generated space which - like a peizo electric membrane - produces charge when "bent"?
In the "perspective inverting" scenario, there could be a figure of eight effect where the macroscopic positive bubble will look, from its inverted perspective, like a microscopic negative bubble. And, of course, vice versa.

A two cycle view. Our universe will be made of many large bubbles that, because of their size, seem to occupy a very similar location. The smallest bubbles may be far more precisely located and also dispersed. They will appear to travel along the (close to zero charge) part of the sine wave traced out by big bubbles (big as in out to deep intergalactic space distances).

An intermingling and interference of these multiple bubbles of positively and negatively charged membranes may be what matter forms out of.

Fig 24

- The real clue to imagining how matter is formed may well lie in working out the fundamental principles of "photon pair" and then "electron pair" generation out of nothing (as in quantum foam) and attempting to visualise just how precisely-zero-energy-balanced photon pairs comes into existence, persists and then (virtually?) annihilate. Perpetual motion is "allowable" in this scenario. What prevents perpetual motion is various forms of friction and energy loss - by heat loss and so, ultimately, infra-red radiation which has to "travel" to deep intergalactic space where repatriation to nothing is guaranteed. But the uncertainty "principle" ensures that virtual photon and electron pairs constantly pop in and out of existence.

# Anchor points:

- The universe emerges from nothing/nihil/zilch and does so as in quantum foam (a consequence of "the" uncertainty principle).
- Matter is rather like a highly compact capacitor. Positive and negative charges are held perilously close together and - at a distance - "equilibrate" their potential differences. Weak nuclear forces probably act in a similar fashion, allowing the perilously close approximation of positive and negative charges without allowing a collapse back to nothingness (which would be a massive release of pure electromagnetic waves that radiate to every - mostly distant - corner of the universe: this is a homogenisation process).
- Energy arises from improbable distributions - the more improbable, the higher the potential difference. Energy and improbability may prove to be pretty much synonymous.

- Matter condenses out of quantum foam in an emergent fashion - akin to biological evolution (electron/positron start the condensation). The essence of evolution is stepwise incremental steps - (usually) small "quantum" jumps (to emphasise the analogy). One configuration - by taking a little "leap" - can transform into another. Time is not necessarily the essence; the essence is incremental steps.
- The former REQUIRES that "positive" and "negative" energy states gradually take on more proximate relationships without being able to cross the ultimate boundary (eg, electrons cannot fall into the nucleus; outside of neutron stars and black holes there is insufficient energy available to contain them within a smaller area than that around an atom [the 2-dimensional electron shell]; the leads to the exclusion principle).
- The extra-electron-shell entropy that rules our daily experiences (the billiard ball property of atoms) and which is manifest by an entropic gradient increasing towards the future must be balanced by an equal and opposite "backwards in time" entropy that is the consequence of a perfectly balanced emergence of matter around the statistical mean (maximal entropy) and adds up to zero.
- The emergence of baryonic concentrations evolved in a balanced "time forward"/"time backward" balance (actually electron-repulsion-driven-entropy and positron-repulsion-driven-entropy) so that the stable states ("close" and balanced -ve charges with +ve charges; the matter capacitor) "persist". This "persistence is, in reality, the consequence of the passage of time slowing towards a standstill as we approach the mean; the mean is "close" to the electron shell dimension and a set of standing waves emerges either side of that "point". So a "virtual" big-bang is "achieved" through a process - as Richard Dawkin's metaphor suggests - of "Climbing mount improbable" but from opposite sides (matter/antimatter constructs) that are mirror images whose (mutual) virtual reflections look like extremely small entities to each other. The absurd improbability of a spontaneous but excessively rare event - the initial "explosive" singularity - forces us into having to invent multiverses to balance this absurd improbability. This invention is forced on us only because we insist on regarding time as a uniquely "forward" entity (multiverses are seen to flow in forward time).
- The future and the past are closely linked by the present - we cannot "touch" the future or the past even though both can be very close: the improbability gradient (energy gradient) of doing so is impossibly high. (Once again, future and past represent electronic-repulsive-entropy and positronic-repulsive-entropy and, just like those - charity - coin whirlpools, persistence "drags" at the smallest radius of the funnel.)
- Gravity might be an expression of an oppositely directed entropy that is increasing towards the past rather than our common experience of entropy that increases towards the future. Since gravity is dominantly an influence manifest in the atomic nucleus (not the electron shell and its surroundings) this puts negative-time-direction entropy firmly "into" the nucleus and positive-time-direction entropy firmly outside the nucleus and towards "outer space".
- The "laws" of physics (they are patterns rather than laws) are remarkably symmetric. The one glaring (apparent) exception is entropy and its accompaniment - time. It is very likely that this is a parochial blind spot in what is, otherwise, a clear general symmetry of "nature". It will be surprising if entropy and time do not, themselves, demonstrate symmetry - we just need to conceptualise how.
- Entropy appears to go one way only because, from our perspective, low frequency electromagnetic radiation "carries the borrowed energy away back into deep intergalactic space where it can repay the debt". The photons doing this have no respect of our parochial time except in how we perceive them. Travelling at the SOL, they take "no time and no distance" to achieve this step (remember the spaceship travelling at the SoL). So, if the idea of a mirror image of matter/antimatter is (possibly) correct, we would have an inversion just at the region defined by the electron shell (or whatever equivalent supercedes this in denser forms of matter). On one side the entropic slide to deep intergalactic space (DIGS) will take place through tangible space (metres) as extra-electron shell EM radiation and on the other, as a slide into (equilibrating/annihilating) DIGS via the "internal" expansion which will be perceived by us as virtually no distance but a very long time (1/D). However, the perspective from the anti-matter reflection inverts, the entropy is in the other "time direction"  By this view, the EM radiation is fleeing away from the extra-positron shell of the anti-matter (reflection?). Its electrons also travel at the speed of light and at their arrival have used up no space or time from their our perspective. So, here is an "instantaneous" virtual inflation that makes it look as though the universe exploded out of a zero sized singularity. The alternative perspective is that matter - and time (where time gives rise to persistence and half lives) - condenses out of 1 then 2 then 3-D "space-branes". In this view, all motion ("space-time-stuff" is more akin to ordered data on a DVD that specifies different "scenarios" in different places and its time element only emerges in deep time wells.
- Let's return to the "coin vortex" analogy - those charity coin collection funnels where the coin can go straight down very quickly if not launched in an orbital trajectory. But, if entered "in orbit", they orbit around the funnel and take an age to disappear. This becomes increasingly exaggerated at the narrowest neck of funnel where persistence at that level increases. Potential energy is converted into kinetic energy which the consequent angular acceleration balances. Now, if the vortex is imagined as a balanced double membrane of positronically charged and electronically charged membranes (in a near ideal capacitor construction), the net charge at any one point subtends to virtually zero once we measure charge at any significant distance away. We can imagine a vortex of electrons spinning in then positrons spinning out . The transition in charge "sign" would probably - rather like a piezo-electric effect - be the consequence of the warping of a space membrane. Warped in one direction, it will produce a positive

charge and in the other, it will be negative. Now, the positronic side - seen from the electronic side - will seem to be within the atomic nucleus. But, viewed from the positronic side, the electronic side will now appear to be the intranuclear side. So we have a virtual transition of matter to antimatter over the electron/positron shell (whichever side you are looking at it from). The distance from the outside largest radius of the tunnel to the tiny exit of the smallest radius of the funnel is very short if the coin goes straight from the lip to the centre. However, if it gets into "orbit" around the funnel, it has to travel a far greater distance to get from largest to smallest radius (particularly if there is little friction). Since this "vortex" constitutes a time "well" within an otherwise "timeless" ocean of photons, an apparent passage of time is "generated" that appears to start beyond the narrowest point of the funnel and finish out at the largest diameter of the funnel. The "nuclear" side seen from the electron shell side will appear to be in the past and the "nuclear" side seen from the positron shell side side will (paradoxically) also seem to be in the past. This is paradoxical because we see the electron shell dispersion as an event going from the present into the future. And, of course, vice versa. This is very much the same Einsteinian paradox seen by two spaceships travelling away from each other at near to the SoL. They each see the other as forshortened in the direction of travel and each sees the other as having a slow running clock. Now, if something that is travelling away from us at the speed of light seems incredibly small, then it is being foreshortened in all three (3-D) dimensions. This absurdity is easier to "swallow" if the real motion is uniformly out from the electron shell to deep intergalactic space but we perceive it, in a virtual fashion, as a condensation at the SoL to a zero sized singularity.

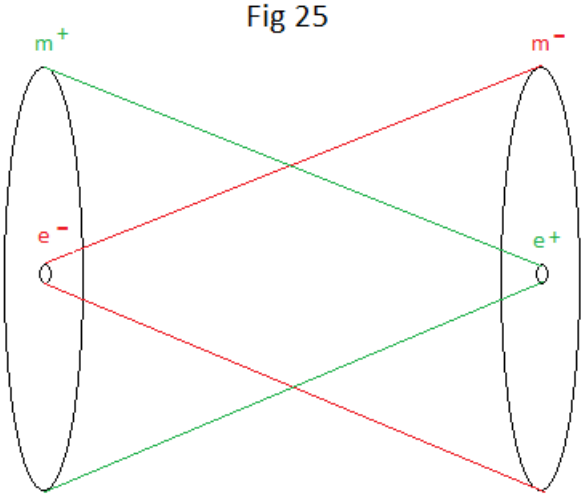
- Emergence (evolution) suggests - to us in our parish - a temporal progression. However, evolution occurs by incremental small steps where the intermediate steps can be understood (ie, a Jumbo Jet does not fall together - perfectly - from its component parts in one chancy event). It is only constrained by a 1900 to 2000 time direction when interpreted from the mass action viewpoint that dominates macro-structures. At the quantal level the time direction can more easily go either way. Gradualistic mechanisms must be possible. The argument that the improbability of the low-entropy big bang can be ignored, because we would not be here to observe it if it hadn't, does not - for me - hold much credibility. It is reminiscent of the idea that we are the outcome of a chance occurrence of life in the universe. We only have to find one instance of self replicating primitive life forms emerging elsewhere in the universe and this self-delusory bubble will burst. Furthermore, get one tiny detail wrong in the initial conditions and these errors will magnify massively as time goes on. Our galactic existence is clearly governed by stable feedback loops; feedback loops are the bread and butter of emergence and morphostasis. We would have to assume this stability was fallen across as a "one in - virtually - infinity" chance event if it were to be caused by an improbable event.
- Advantages of this perception include: (1) entry into and out of atoms is at the SoL - so whenever the SoL is measured (with an apparatus made of matter) it will always be the same; (2) anything that seems to be smaller than (around) electron shell size is "virtual" and is the outcome of looking at wave/particles as they appear within "inner space" (inside the electron shell); electrons, themselves, are a "reflection" of the positively charged/curved space outside of the electron shell - effectively, large magnetic "monopoles" of space (from the other side the "image" is inverted and the electron looks like a a large magnetic "monopole" surrounding a positron); I have used the word "monopole" for convenience and to link it to a theoretical entity; however, this magnetic entity always surrounds its electron/positron counterpart (3) the Einsteinian "prediction" of an infinitely dense singularity never occurs because, at the electron shell, there is a sudden change in direction; although it looks like any object (photon or collection of particles) is getting smaller, it is receding from the outside of the mirrored positron shell at the same speed of light or is held up in the vortex of the atomic shell; (4) the way a photon appears to reflect instantaneously can fit nicely with this perception and the inevitable presence of electron/positron "pairs" at the boundary.
- Just a note on reflection/refraction: I am increasingly tempted into seeing the "virtual singularity" as a reflection point. As the angle of approach towards a singularity changes (from a sideways to a head on approach), so fewer and fewer incident photons (and other bosons perhaps?) will be able to penetrate deeper towards the "singularity" - where the refractive index approaches "infinite" values. [Think of aiming a single photon from 10 billion light years away so that this reaches the singularity in an exactly normal trajectory.] Ultimately, we can imagine that no more photons (however "exactly" perpendicular in approach they are) will be able to escape reflection. This fits nicely with viewing the "virtual-ultimate-singularity" as the bottom of a time (persistence) well where everything has come to a virtual standstill. Don't forget that this is - effectively - a virtual "forward and backward" time well (the nuclear passage of time appears to project backwards in time but this is just illusion). This contrasts with the frenetic "universe" of frantic photons dashing around at the SoL that are never "stationary". This is more typical of interstellar/galactic space (even though their concentration is low there). The forward time bit implies that a dispersion is occurring extra-electron-shell and the backward time bit implies that dispersion is occurring extra-positron-shell. The resolution of conceptualisation could be resolved by seeing these two sides as opposite "sides" of a torus, where we are "living" (existing) in close "proximity" to the neck of the torus. Entropic dispersion will occur - on both side of the torus - towards conditions typical of deep intergalactic space. The tunnel of the torus is where we sense "intra-atomic" (nuclear) structures and so, the extra-positron-shell side remains unappreciated by the extra-electron-shell side (and vice versa) except as apparent (virtual) intra-nuclear structures. The apparent arrow of time is dictated by the direction of atomic dispersion. Dispersion (time) seems to be virtually at a standstill

in the "funnel-tunnel" of the torus and this dispersion (homogenisation) eventually turns into low frequency photonic radiation that is directed out into conditions typical of deep intergalactic space. Once dispersion had led to this low frequency (infra red) photonic radiation, this radiation phrenetically careers around its parish at the SoL - having escaped from a point subtending to the black hole/"big-bang" event horizon. Remember, once the time well grows, there is a time "wormhole" that keeps all matter apparently tethered together by "gravity". All baryonic matter is tehtered together in this way (the electons are careering around the "funnel-tunnel at close to the SoL.

- This leads to a view of electrons (and positrons) as an oscillating-contracting-and-expanding (figure of 8) pair of spatial bubbles at the base of a the time well. Their curvature generates "surface charge". We could imagine it as the pair bouncing/oscillating up and down in step with each other. One complete cycle involves the following sequence: The positronic side produces a large (macroscopic) magnetic "monopole" that surrounds its corresponding tiny electron - which is the virtual point particle that appears to be within the torus neck. This pair then oscillate into the exact reverse on the electronic side (large electronic magnetic monopole surrounding a tiny corresponding positron). One complete cycle goes through 720 degrees (360 on electronic side and 360 on positronic side) and this oscillatory pattern (oscillation =persistence) appear to form a stable electron (or positron). This could be the origin of the "spin half" property of leptons (and quarks if they are a virtual intra-nuclear projection of the positronic side).
- So - further developing this set of ideas - here is what it seems to be pointing towards.
  - Everything in this universe we know is made up of expanding/contracting spatial "bubbles".
  - Light (a photon) is an oscillating expanding/contracting spatial bubble (collapsing, inverting, expanding, collapsing, inverting, expanding, collapsing, inverting and etc). Inversion swaps the charge "sign" from positive to negative. (Perhaps expanding/contracting is what swaps the apparent charge.) Because they oscillate very fast on one or other side of the matter/antimatter divide, they have an "at a distance" net-zero apparent charge.
  - The electron (a positron when seen from the positronic side of the anti-matter "universe") is situated near the smallest (quantum one) balance point between collapse and expansion. Anything apparently smaller than electron shell size is in "virtual" territory. It is NOT smaller. It LOOKs smaller because it is a mirage formed as a virtual image BENEATH "quantum one" size. Our electron shells look like nuclear material when viewed from the antimatter positronic shelled universe (and of course, vice versa). Anything "within" the nucleus is a virtual image (for us) of the anti-matter universe (a virtual universe within an atom). Electron positron pairs are, in effect, a single unit made up of, at most, a pair of expanding contracting spatial bubbles oscillating back and forth at the deepest point of the time well (electron shell - quantum one - size). Currently, I favour a single, not a pair of spatial bubbles. If we could view the creation of an electron/positron pair in slow motion (in a bubble chamber), would we see a positron appear in the periphery, rotate in an expanding spiral until it meets the "creating" high energy photon, then spiral away as an electron in a contracting spiral into the periphery. This oscillation at the "pit" of the time well gives them constant apparent positive or negative charge (depending on which matter or antimatter side they are perceived from) and great persistence (an oscillating, high non-prime quantum number construction) and apparently limitless half lives.
  - All these bubbles subtend towards merging "black holes" focused at the most condensed part of the "universe". Although stars rotate around galaxy centres and planets, rocks, dust and lots of hydrogen rotate around stars, they do so in "sling shot manner" (expediting some spatial bubbles towards the multi-D condensed virtual singularity) to gain themselves persistence (oscillation, high non-prime quantum number content). Although the distance from moon to earth, earth to sun, sun to galactic centre looks very large to us, seen from the anti-matter side these distances appear to be sub electron shell size. So, from one point of view these celestial bodies are in an "umbilical connection" (we interpret it as gravity). I guess that "inflation" is buried somewhere in this principle of virtual imaging.
  - The largest bubble size is big-bang-to-today sized (14 Bn LY). We - as matter - are situated close to the final-collapse-to-reversing-expansion point. To resist the natural "cycle" from final callapse to new expansion, we constitute a turmoil of vortices balanced by closely approximated matter/antimatter, positively charged/negatively charged "capacitors". It is we that are accelerating outwards from this natural point of collapse-before-expansion and we do so at the speed of light. Light enters and leaves the quantum one electron shell locality at the speed of light. So every instrument used to measure the SoL (that is made of atoms) sees it as both a constant and a "speed barrier". The transition from collapse to expansion does not occur at a single discernable point when viewed from the electronic/matter side but does appear to do so when viewed from the positronic/antimatter side (effectively, their apparent "big-bang"?).
  - Although we can visualise all this like a torus, it is more a massive to tiny then tiny to massive then massive to tiny cycle around the same focus. The expanding "torus" of the antimatter side is in the same "place" but as as it is expanding into our past, rather than into future we find it hard to notice.
  - Remember, we could envisage the sequence, universe sized bubble to quantum-one sized bubble to universe size bubble to quantum-one size bubble, as a sine wave of the expansion and contraction of the bubble. At the quantum-one point, the sine wave has its maximum "acceleration" through this quantum-one point and does so at its highest rate of change in size - which gives us the source of the Speed of Light.

- Note that Minkowski space reflects quantum-one (and quantum two then three and so on) sized contraction. Quantum-one contraction is harder to establish than two and two harder than three and so on. This is shown in the diagrams above on Minkowski space. This makes it easier to see that it is compaction that gets exponentially harder and harder to establish (persistence around either side of the contraction/expansion point. Our parish is so highly populated by compactified "stuff" that we regard it as the norm though it is - in universal terms - extremely unusual (remember, swimming in water as mentioned earlier in the entropy discussion).
- I suspect that time and movement are nothing like as meaningful in the non-compactified parishes of our universe (a low frequency photon "only" environment).
- I guess that refining these perceptions may prove useful.
- So why can we not sense this flow of "in and out" entities formed from electromagnetic waves (spatial bubbles perhaps)? It may simply be that the "out" property is the magnetic component and the "in" component is the electron component (and its charge). The electron may be the magnetic component of the "the other side (the antimatter side)". An extreme fish-eye view through the inner electron shell would project the enlarging electron shells as objects "focused" near to the centre - creating a virtual-pin-point-central image (like looking through a door peep hole). By this view, the electron is never "smaller" than the shell but acts as if it were. The nucleus, by this analogy, is somehow "formed" (virtually) out of the interacting $m^+/e^+$ "shells". There may be some value in pursuing this perspective but it remains very vague as yet.

Fig 25




- Just a point of principle: At the distances where electrons and their shells exist, it is clear that the "world" is dominated by waves. These particles act like waves so they ought to be fully capable of creating "virtual entities" that seem both to be and to act as if they were smaller. The tiny strings of the string theorists could be the most distant $m^-$ "bubbles".
- The central electron shell (and others?) could be regarded as creating a worm hole, through which we end up with a peep-hole through to the "anti-universe" (like a hotel door peep-hole but a much more dramatic fish eye outcome). So, distance and time are inverted across the mean (central electron shell) from each other side's perspective - although space-time probably remains constant.
- Should we regard the background of space (or space-time) to be - effectively - waves that emanate from the electron shells (eg, photonic waves) and from the positronic shells (that we perceive as fundamental constituents of the nucleus, the we can conjure up some glimpse of a vortex of standing waves that sits - in a matter/anitmatter balanced fashion - either side of compaction then expansion of Minkowski space. The electron shell, here, is the minimum size (quantal unit size). Things might appear smaller but that may just be an illusion of ***projection*** towards a virtual singularity. In this view, the largest diameter possible in the universe (appears) to oscillate from $m^+$ (diagram above), through the minimum electron shell "size" to $m^-$ as above. Without any vortices close to "now", the wave would pass into and out of the electron shell size limit with a bounce (in to out - though we would perceive the out to being compaction towards "string size" - and at this point the rate of change of diameter would be on the most rapid speed change of the sine wave (like the lengthening or shortening

of daylight in March and September) and this speed would correspond to the speed of light. It is space that is contracting then expanding. But the schizophrenic perception from either apposing side is that the big of our matter parish looks small and nuclear to the anti-matter parish, and the small and nuclear of our matter parish is the big of the anti-matter parish. So, what it now looks like is the double cone of Minkowski space (diagram above) with spatial expansion accelerating at the broad end of the cones so that they can wrap around to meet each other and complete a true annihilation of the "top and bottom faces" of the quantum foam "dice". By this view, baryonic matter is composed of standing waves that grow in order within the chaos of the vortex close to "now" (where the tips of two light cones "touch"; the bases "wrap around" to meet each other). There is much more thought to go into this but it looks a promising avenue to explore. We can consider the photons to be - effectively - bidirectional. Because time does not pass for a photon, it is only the parish of the observer that gives the photon an apparent direction and speed.

- So, a photon can be across the universe in an instant (as far as it is concerned) and the distance travelled is foreshortened to virtually nothing. That leads on to the conjecture that quantum foam occurs everywhere (in deep intergalactic space and, even, extreme extra-galactic space) and it is not constrained by time. Matter, however, occurs as a (past) time well within this (to us) vast cosmos. That time well is moving back to timelessness (ultimately as infrared radiation and, perhaps, various neutrinos) in both the extra-electron-shell (matter) universe direction and the "through" the electron shell wormhole into the extra-positron-shell universe direction. Both lead back to timelessness. Time is the illusion of distance compaction "through" the electron shell wormhole. In reality, both extra-electron and extra-positron shell expanding-radiation may be mirror images of each other. Where the density of matter rises so high that it is becomes an extreme improbability that anything will approach in a sufficiently exact normal approach to a virtual singularity, then it will be reflected back because the refractive index has risen so high. But, that reflection will involve a time delay that is as long as the universe's "age" (the depth of the time well).
- Developing the idea of an umbilical connection between past and future through the electron shell "wormhole" would probably help to understand how distance becomes dominantly "seen" as time once through this shell. The electronic exterior (matter) and the positronic exterior (ani-matter) universes are extremely close to each other. They are close enough to form a matter capacitor - as above. However, although this umbilical can be regarded as (virtually) contiguous with the unit size point (almost a singularlity, the touching tips of the Minkowski light cones and the electron shell point) and the whole anti-universe appears to be inside each electron shell, we cannot practically move from our matter armchair to our anti-matter armchair without going the long way around (light cone expansion then contraction until the cycle is complete) and that would be a long long way around. This umbilical becomes more obvious if we force ourselves to accept that it is the electron shells of our constituent atoms that are accelerating out at near the speed of light - in sling shot fashion - to avoid instant passage through the unit sized singularity to the anti-universe side. Although the electron shell of a hydrogen atom in our arm seems a long way from a hydrogen atom in the sun (even just outside the black-hole-galactic-centre) it could be very close but, because of the acceleration away from either side of the virtual singularity of each electron shell, time comes to a virtual standstill and the distance appears to be exceedingly great. Every electron shell may be virtually contiguous with all the others in the universe - an idea that fits with there only really being just one electron - trillions of electrons ibeing an illusion not a reality.
- So, we have "matter" forming around the electron shell minimum "real" (vs projected, imaginary) contraction. However, rather than being a double cone as in Minkowski space, we need to imagine that waves can occupy any position from the deepest intra-(or extra-) galactic space to the electron shell minimum. So a wave "running through" (if that is an appropriate metaphor) will contract from all around the whole of space, through until it concentrtes on a "single electron shell" then bounce back out. Imagine it as a contracting then expanding sphere that goes from immensely big to minimally small. Just as in any sine wave, the rate of change is maximal as the sine wave crosses the ventral axis when its amplitude is small (electron shell size) and minimal at its highest amplitude ("universe" size). So, the dominance of external electrons happens on the "South side" and the dominance of positrons happens on the "North side". If matter forms from electron positron "capacitor pairs", then they are both expanding "outwards" at the speed of light but in opposite directions (from each other. For the electron outside ("South side") the positron outside will appear as if it is moving away at the speed of light in all its dimensions and will appear to be heavy and extremely small. If the pairs exist because a wave can oscillate just either side of the electron shell, in a perfectly balanced charge that makes them persistent (resonance = persistence) we can imagine that the two "pond ripples" are in a perfect North South oscillation with each ripple when in the South looking like a magnetic "string" whilst its balancing partner looks like a point electron; and vice versa for the other side. Once we see anything further out on the positronic side ("North side"), looking from well outside the electron shell on the "South side", it will appear to us as an atomic nucleus and, courtesy of its travelling away at the SoL, it will seem to be extemely small. Now this is more consistent with the notion that gravity is just an accelerating elevator/rocket engine under our feet. Although it is incredibly counterintuitive, the strange antics of "things" travelling away from us at the SoL makes this possible.
- So how can the big sphere -> electron shell sized (little) sphere -> big sphere -> little sphere cycle instantly

change direction to retrace its steps? Simply because it is a reflection and that reflection is possible because there is an "immediate" umbilical connection at the electron shell with the whole "mass of the anti-matter universe". The thing that maintains the matter capacitor is a dance close to the electron shell perimeter going on between electron/positron pairs. This may help to explain the absence of "apparent" radiation from rotating electrons and the need for standing waves values in order to resonate/persist. By this view time may simply still be a distance but, instead of a straight dash to deep intergalactic space, the distane is taken up by going around and around (in maybe multiple dimensions) in a very small (to us) space. I like this explanation as a possibility. Also, to latch into an electron positron dance, the velocity approaches of the nascent pair need to be closely matched. Those that do not latch into a dance just do the in out thing without us noticing (probably the vast majority - remember the sling shot principle).

- "Photons" (as particles). I suspect that a photon is either an approaching of retreating wavefront. It will be approaching or receding at the SoL. Thus, even though its origin "size" may be very large, it will still appear to us as a tiny "particle" (size contraction). The next bit needs thinking through more BUT - for now - the approaching or receding wavefront has a superimposed oscillation in the location of its interaction with electron shells. That oscillation involves an oscillating electrical charge (particle like) and an oscillating magnetic field (pond ripple like) because phenomenon similar to the atom is occurring; the magnetic field is analogously extra-electron shell and the charge is analogously extra positron shell (corresponding to the electron shell minimum possible contraction). It looks smaller because it is moving towards us or away from us at the SoL. This attempted explanation is all mixed up and needs thinking thru a lot more but, the vestige of an explanation is here, we see an apparently point like/particle like component while there is a much larger wave like component (but it is part of the same "unit"). In reality they are similarly "sized" but we have the "illusion" of relativistic contraction of the particle bit. Why does it "oscillate" and what is oscillating? are questions that need to be resolved.
- If we now look at a perfectly round pond with coherent ripples being generated at the margins of the pool, in such a way that the 180 degree out of phase bits can't cancel - they are "kept apart", then the waves approach the centre of the pond in decreasing circumference then pass through in increasing circumference. Unless the coherent production is absolutely perfect there will be some "vortex" effects giving rise, potentially, to standing waves near the crossover. So this is a rough idea of what may be happening. But we know - from the Casimir effect - that spontaneous generation of particles occurs out of nothing and "everywhere". I have suggested that this is a bit like a pile of +3 to -3 dice which, when thrown can produce unusual single sided distributions though the top and bottom sides add up exactly to zero. Now, this gives us a feel for what may be happening. The spontaneous ripples (quantum foam) can - from time to time - remain unequilibrated (remain in their 180 degree out of phase state) over large distances (interchangeable with time at the SoL - so last for a long time). Now, if there is a way for these to evolve into ever more persistent (equivalent to long distance) states because they are more stable (don't break up over large distances) then matter capacitors can form. The important point to grasp, though, is that these capacitors are "moving" at the SoL with respect to a pond wavefront. I think this has the rudimentary elements of a very useful analogy. In reality, there are multiple potential pond margins (quantum foam occurs everywhere) and multiple potential pond "centres". So, what we see is multiple vortices of matter (galaxies around black holes). Ultimately, all black holes are wormholes towards a minimum contraction and the antimatter side appears to us to be the outcome of "the big bang".
- So - at one extreme we have DIGs (deep intergalactic space) occupied by a handful of hydrogen atoms per cu meter. And at the other we have the "singularity" of supermassive black holes (I have already suggested that we cannot get below unit-one - no fractions of units - in a "real" sense though we have a virtual impression that it does). So what is the difference between quantum foam and solid matter? It is persistence. Persistence means resonance. Resonance means "nowhere near a prime number". Primes have unit "persistence" (they are extremely evanescent). Electrons have very stable resonance and the intervals between primes are always in some multiple of 2. So, this suggests that the most fundamental building blocks of our universe may be integers. To have integers we need to works out - very simplistically, what consitutes the integer "dice" that builds our universe. That looks like a photonic "pond ripple" where space emerges across an imaginery membrane in evanescent +ve and -ve extrusions into matter antimatter universes that will annihilate to nothing unless they - by chance - "discover" a resonant partner. And that sounds remarkably like it may be electron positron pairs. And that, is a dance across either side of null (nothingness) where large magnetic monopoles look like an electron or positron when viewed from the opposite side of the mean (null) and they manage to form a matter capacitor. Provided the capacitor dielectric is high and its resistence is also high, the intrinsic +ve or negative charge on either side will repel electrons away from each other (and positorns form each other) whilst maintaining tiny real distances but enormous effort distances between electron and positron (the capacitor). In actuality an electron may actually BE its partner positron but appear separate because of the matter or antimatter "universe" side from which it is "viewed".
- That leads to another thought. An ultimate resonant prime is $2^n$ where n is a very big number. Others would also be very resonant, eg, $6^m \times 2^n$ where m is any number from zero but none would approach $2^n$. So what would a

very persistent singularity look like? The structure of matter, starting with hydrogen and going up to elements heavier that uranium, involves stacking these resonances one above another. There is no reason why this stacking cannot continue beyond the heaviest element here on earth. Here, however, our parish is not suited for these to persist. But in a neutron star things are different. "In" a black hole it is an even more extreme parish.

- Going back to persistence and time: a photon has distance but no time. It is a "filament" stretched out to its "fairly" full extent. A resonant prime of $2^n$ may actually traverse the same distance as a photon but not in a straight line - it goes around and around. If a photon is - eventually - a ripple in spacetime that will annihilate when it meets its 180 degree out of phase (entangled) partner then spacetime is a loop of some sort. These loops can loop a long way around a big-bang/black-hole ripple although both may traverse the same distance. If we look at a photon end on, all we see is a loop. There is already a suspicion that looking at the anti-universe side of black holes (big bang) reverses the perspective so that it is now the photons that seem to be wrapped into loops and the black hole is like an end on photon. I think there may be mileage in developing this perspective.
- Right! Here is an idea on how things might be conceived. Go back to Fig 3 and Fig 4 - the "expanding sphere with time wells" diagram. The outer surface of this sphere is where light will “expand” the universe into deep intergalactic space – where there is almost total darkness. All that will be visible is the faint glow of distant galaxies. The probability of any baryonic voyager travelling here, even at a substantial portion of the speed of light, would be very small and extremely “costly” in both energy and time. The outer part of the sphere (without time wells) will, therefore, be populated – almost exclusively – by photons. With this diagram we have to remember that space is three dimensional. The 2D spherical surface is really 3D space which is curved back on itself. Any point on this 2D spherical surface represents just two of the X, Y and Z co-ordinates of our common 3D experience. It helps us to understand it. It can equally represent the X + Y, the Y + Z and the Z + X co-ordinates. It is only our imagination that is stretched by this. A “pond ripple” beginning at any point on this spherical surface will spread out to the maximum radius (and, by then, the longest wavelength) then converge back and in towards its antinode where it will pass through the minimum possible wavelength before it then expands back out again to the maximum radius and then converges back again to its origin. As it passes through its antinode, it effectively "reflects back around the circumference" but phase inverted so that, by the time it reaches its origin, its "energy" is potentially of the same amplitude as it original "pond ripple" but, if it could be added to it, could add up to zero. This would be like the "opposite sides of the entropic dice". (Needs thinking through). But, you may say, billions/trillions of years have passed since the pond ripple left its origin. But no, not at the speed of light. For the photonic ripple, thanks to Einstein's realisations, it takes this photon, travelling at the SoL, no time at all to make the "journey". Effectively, on the periphery of this sphere, there is nothing but photonic "material"; matter capacitors cannot exist out there. This is consistent with the way entropy always leads to infra-red radiation passing out into deep intergalactic space. Matter eventually "decays" to radiation as matter capacitors eventually "fail". Now, wherever we (electrical capacitor, baryonic matter individuals) look at these ripples, they are approaching us at the SoL and receding from us at the SoL. They appear - to us - as a point like origin. We interpret the ripple arrival or departure, arising from or terminating on the other side of the sphere, as a 2D beam (a straight line). When we see a torch switched on, it is no different. We are deep in a time well. So the origin and arrival of the beam is way down towards the bottom of a time well (Fig 3 and Fig 4).
- Continued.... Now, we have got a sniff of the fact that the photonic spheres are not all necessarily billions/trillions (or more) years in radius. They are a myriad mix of all size spheres (perhaps even a fractal structure of same “shaped” structures). Or perhaps it is only one expanding sphere whose myriad (possible) incremental sizes exist simultaneously outside of time. They are all there forever, timeless and all at "the same time". Each sphere size exists; time cannot annihilate it ("gone forever" is our parochial expectation). Now, as an aside, the link into prime numbers and "resonant numbers" could be reflected in this idea of one sphere trying our all possible dimensions. At the periphery, only the largest pond ripples exist (a universe of very big primes where the interval to the next prime is approaching or exceeds the big prime itself). At the origin (deepest part of the time well) only highly resonant primes persist (to form electron shells, they must be non-primes to be able to fit inside a larger “number”. So, what is rippling? Well, we here, on our expanding time sphere diagram (Fig 3) it is the distance from the central “origin” (the minimum dimension where the time well is deepest and addumed, above, to be around electron shell dimension). Remember that, for light – distance equals time). There is probably some fundamental uncertainty about distance (for these ripples) that sets off the “wobble”. At the minimum dimension, distance is "all time". The “straight lining” photon gets wound up into ever more compacts spirals; remember those charity coin vortices and how the coin lingers in the tight throat of the cone. Out at the periphery (the largest dimensions) the spiral is almost totally unwound (straight lining) whilst at the centre it is in an ever more tightly wound spiral. That might tie in nicely to the observation that "condensation" (or capacitation !!) into matter capacitors closes one of the three dimensions (think of a gyroscope and how hard it is to alter its rotating plane). Condensation of matter from the photonic periphery to the baryonic “throat” is always down through discs (eg, galaxies, planetary orbits). (#### this is not right yet - the gyroscope bit.)
- Continued .... So, matter condenses (capacitates) around the node/antinode crossovers of photonic ripples. A vortex of resonant structures builds up in a disc like way (Fig 14) and, effectively, creates times wells

“everywhere” on the “surfaces” of this photonic sphere. Our apparent origin (big bang) is, in reality, a time well "into the past" that "condenses" (capacitates) out of a timeless 3rd dimensional ripple on a 2D spherical "membrane". Not only does it condense distance into time but it has a reverse action when through the node/antinode when it re-expands back out but phase inverted. SO, time forward (as we see it) is from the throat of the spiral to deep intergalactic space. The throat of the vortex holds electron positron pairs apart so they do not annihilate back to pure photons but this vortex is so intense that it acts like a “perfect” dielectric that keeps the charges close but separated. The positronic shells look like nuclei to us and the electronic shells look like anti-nuclei to the antimatter side. Time dilation ends up as being just spirally wound distance. A light year is a maximally unwound electromagnetic “string”. These ripples correspond to magnetic "monopoles" which, when viewed from across the minimum dimension (the other side of a vortex minima), look like point sized electrons or positrons. The matter capacitor occurs where the "pond ripple" is approaching the "node/antinode) point then receding from it as it "passes through". Resonances (persistence) can condense (capacitate) out of this either side of the minimum size (vortex throat). Viewed from the "approaching side" the positively charged nucleus looks tiny, surrounded by an electron cloud. Viewed from the receding side, it looks like a tiny negatively charged nucleus surrounded by a positronic cloud. The "forces" that keep the out of phase ripples from collapsing together (the ripples annihilating) are, at least partially, rotational forces. We can already see that in a gyroscope, the periphery of the disc (we'll call it "in the X plane) has, effectively, farther to travel than the Y or Z planes would when we try to change its X plane towards a Y or Z plane. (Draw a rotating gyroscope on an X,Y,Z graph, rotating around the Y axis; it requires not a great deal of force to move the gyroscope up or down the Y axis, along the X axis or along the Z axis. But try and shift the X,Z axis plane and you realise the Y axis has to travel "much further" that the X and Z axes in this axis rotation. The Y axis is "expanding out". Dimensional contraction (the opposite to what happens with the Y axis of the gyroscope) may apply to further dimensions that "disappear" from our common experience (this is still “wrong”).

- Continued .... The ultimate result is that matter condensation (capacitation) occurs either side of the minimum size (vortex throat/node/antinode). It occurs in a "time well" condensing out of a timeless photonic sea. The matter "universe" is separated from the "antimatter" universe by the rotational forces around this well. Once the capacitance is released back to photonic ripples, they can return as intense radiation to the periphery of Fig 3 - but the journey is instant from the ripple's perspective (travelling at the SoL; effectively, the origin and arrival are a linked unit - they can each affect the other, they are entangled).
- Continued ..... Consider the situation around a nodal/anti-nodal point as the photonic wave "converges" then "diverges" with a 180 degree phase shift. (That needs thinking thru for a 3D interpretation of the node/antinode.) So, many photonic waves are approaching an electron shell sized "point" at the SoL then leaving (bouncing out in anti-phase) at the SoL. If two opposing photons are appropriately "tuned" (entering at the right angular momentum, perhaps) they can then enter a dance around the electron shell minimum (the mean) and take up a figure of eight alternating dance. Provided that this dance occurs across the plane of a vortex, the positive excursions can "point" to the antimatter side of this plane and the negative excursions to the matter side. The vortex ensures that, although the two are right next to each other (much less - perhaps - than an electron shell distance) they are energetically "miles if not light years apart" and appear as positive or negative electric charges. So, we have a sea of electron/positron pairs at the nodes and the excursions of these pairs turns them from positive to negative as they cross the "zero" point of the node. They are effectively rectified across the plane but balance each other out into an apparent persistent electron (when seen from the matter side) and positron (when seen from the antimatter side). The wave will look just like a rectified alternating current as it has gone through a bridge rectifier. With enough sudden energy, the electron or positron can be occasionally projected to the other side but - on the "wrong side" - they will leave the vortex dielectric and be released - as a pair - back into pure photons. Bang !!
- Continued .... Now we can reconsider the double slit experiment again. If a photon takes ap a fractal like shape (same shape many different sizes) we can imaging the experiment as a mini expanding contracting sphere (FIg 3). The the anti-node bound wave occurs as a tiny ripple (closer/further away) on the "south" magnetic route from node to anti-node and vice versa for the returning nodal bound wave. Because it is approaching and retreating at the SoL, it looks like a point source and a point arrival and anything that blocks out the virtual straight line between source and arrival will block transmission. Putting two slits in between will, perhaps, turn the experiment into two "fractals", the one before and the one after the slits. The influence around the sphere will be there (the magnetic components extend right around the room. The electric components of the EM wave are how these magnetic "monopoles" appear to us when approaching or receding at the SoL.
- None of this addresses other fundamental particles and that needs addressing. However, if these ruminations have some merit (and are not embarassingly, spectacularly wrong) then we can leave the quarks to look after themselves for now. How do muon and tau fit in beside electron leptons? They are spin half (suggests they oscillate about the mean), charge -1 (or +1 as anti-muon and anti-tau) so they bend space like magnetic "monopoles" (remember from one universe or one anti-unverse side it's a big magnetic field and the seen through the "mean" it looks like an electric charge). So the goal is to get a concept of why they do not form much

baryonic matter (they are less stable around a vortex) and what the meaning of their respective neutrinos represent. The latter are "one sided" - that is, they "travel" from a nodal/antinodal vortex throat out to deep intergalactic space without ever oscillating around the mean. So, here is a start.

- Continued .... It remains vague still but there are some integrative points that have come out of this. To be continued .....
- As a point of interest, consider how a photon "docks in to orbit" to create an electron positron pair. It must be "caught" in this orbit and that requires some pretty special initiating conditions. Just as an asteroid will generally either glance our planet or crash into the earth so with photonic waves. Rarely, though, the goldilocks condition occurs and two waves approach each other at the right distance and the right speed and in the right dance with its partnering photonic wave that then makes a pair of oppositely phased (and so charged) photon pairs that can oscillate back and forward across the mean creating an apparent electron/positron pair. It is just a captive pair of contracting/expanding spatial oscillalations whose "membranes" are "charged" according to whether they extrude "north pole" or "couth pole". Seen from the opposite pole, these look like point charges (electric charge). Seen from the same side, they look like a magnetic field (loosely, a membranous "string"). I like this way of looking at things - it makes a bit of sense of a variety of known behaviours.
- It seems strange that this inversion of perspective is even possible - but Einstein's realisation makes it so. We have a situation where a standing wave of collapsing expanding/space could lead to a dumbell pair of photonic waves that "contra-rotate" and so hold each other together to create an electron/positron pair. Effectively, this pair appear rectified when looking from the electrons-outside (matter) perspective or the positrons-outside (antimatter) perspective. These collapsing/expanding spatial waves are moving at the speed of light as they crossover from one side to the other. They are exchanging potential for kinetic energy (and back) at every oscillation. If they could meet under other circumstances, they would annihilate (like in the anti-nodes of a diffraction pattern). The passage of time for the intra-electron shell side will, thus, appear to us to be very slow if not almost stopped (probably just slow - because they are not always travelling to or from the electron shell minima at the SoL; only at crossover do they reach maximum speed). Likewise the "size" of the receding photonic wave will appear to be extremely small on the intra-electron shell side. However, the perspective is inverted from the other side of this expanding contracting point. It works, in effect, like the throat (minima) of a torus or disk. The "funnel" of this torus extends - virtually I guess - back towards the "time" of what we consider as the big bang (or time zero); certainly it appears to "project" towards a black hole event singularity (zero size). Effectively, the electron-inside matter is accelerating out towards us. It has a gravitational rocket motor effect when we look at large aggregates of atomic nuclei. The centre of the earth is rushing out to towards us like the floor of a 1G lift (here on earth). Although the inside of a nucleus looks small to us and is apparently within the electron shell, the constituent standing wave, at it highest potential (vs kinetic) energy, is moving away from us at the SoL. The force this exerts on the electron shell is what we feel as we are repelled away from adjacent atoms. (All poorly described and this must be improved).
- So how are muons and tau electrons "made"? One tempting suggestion is that, like the national grid, instead of a two phase (180 degree "out" of synchronisation) electron/positron pair we may be seeing a three phase muon/antimuon dance (only the antiparticle flavour when it is traversing the intra-electron shell - anti-matter-side) and a five phase tau electron. The probability of a perfectly matched 180 degree out of sync two phase pair coming together at the right time, angle of approach and speed seems - intuitively - small. A three phase triplet is much more unlikely and a five phase quintuplet far more unlikely still. As they are increasingly improbable, their energies should be higher (by far) than an electron and thus, their masses, equally larger. (Nb, four phase would be just a special variety consisting of two pairs of two phase photons.) Theoretically, higher "phase" leptons might exist but they will - in all probability - become vanishingly improbable in our parish. A seven phase "dance" would involve masses of around 20,000 MeV or more and a life time of around $10^{-20}$ secs if we simply extrapolate from electron to muon to tau and then beyond. This point is quite important because an oscillating light wave (photonic complex) may appear to be travelling at the SoL but, like electrons in a cable, the actual speed of "travel" of electrons in an AC cable is low and the total number of electrons flowing is close to zero. What is happening is the the source voltage is "shaking" the target voltage to follow the source. The final current flow takes place between the three phases of three cables in the vicinity of the target. No "zero" voltage return cable is needed to return the current "back" to the source. This is analogous to what may be happening with electromagnetic radiation.
- Let's go back to figure 3. Remember that the surface of the sphere only represents 2 of the three conventional 3-D dimensions . We have to keep reminding ourselves that the radius is not a distance even though the circumference represents the spatial part of space-time. Instead it represents dimensional compaction. At the sphere surface it could be 2-D or 3-D. As we move closer to the centre of the sphere, the "strings" (probably magnetic strings, rings or "hollow" spheres - 1-D, 2-D then 3-D respectively) become progressively wound into higher dimensional compactions in vortices of "matter" capacitance and compaction. As compaction increases, so the stability of ever more condensed matter capacitance increase. In our "parish", the electron shell of iron is very stable and the very heavy elements (uranium and beyond) become increasingly unstable - ***in our parish***. In

a neutron star the compaction goes on and - in that parish - it is very stable. What we experience as magnetic fields may represent the rings/hollow spheres of space that are trying to contract towards zero radius (just as happens when you hold North and South poles of a magnet close together). These magnetic fields are "large" because they are "travelling" away from the electron shell sized minima at close to the SoL and our perception of a "now" point. The electrons in the electron shell are travelling (with respect to the "static" macroscopic state of a lump of iron for example) in a series of dimensional spins that bring the electron's speed to close to relativistic effects and it typically appears very small to us living outside of this shell. The "through the electron shell" side (or intranuclear, or positronic/antimatter side) appear very small and are probably connected by a sort of "cosmic string" to the black hole/big bang virtual singularity at the centre of our galaxy and, even, the big bang singularity. The incoming string (wave) approaches the "now" point at the SoL as a photon of light. This is composed of a larger magnetic oscillation and a tiny (across the mean) electrical oscillation. Seen across the matter/antimatter divide, the perspective reverses.

- This leads on to the speculation that all "events" are electromagnetic oscillations. The across the mean (antimatter side) component appears to the matter side as a particle. Since electrons circle the electron shell minima at near relativistic speeds, these also appear particle like to us clutching our lum of iron. But both electrons and photons are alternating across the mean. Electrons probably alternate across the mean as the matter side expression of a dumbell pair of an electron and a positron. Each time an electron crosses the mean it is "turns into" a positron (and vice versa). What we regard as an electron is a rectified sawtooth of negatively "bent" space (a magnetic coccoon that "wants" to collapse to the quantal minimum radius). When an electron meets a positron on the matter side of the mean, then this neutralises the spatial cocoon and the figure of 8 "dance" ends to release all the "improbability" of the matter capacitance back to fleeing photons. This is all highly conjectural BUT it does start to make some "classical" sense of what might be happening.
- The spatial cocoons are probably built up like fractals. The basic "magnetic vortex" (like a bar magnet's magnetic lines with the magnet removed) is made up of a chaotic vortex of spatial cocoons ranging from atom sized to galaxy sized (and, perhaps, even universe sized) spatial cocoons. It is tempting to think that these might be rather like soap bubbles where the internal pressure (to collapse) decreases with increasing radius (and, of course, vice versa). Matter capacitors may help to keep them "inflated" by creating "surface tension".
- A big problem is to conceptualise why we don't see the "antiverse" side and don't experience it. But, perhaps we do. It is tempting to conceive that, for instance, when a muon "decays" (looses triphasic stability) it degenerates from three to two phases. It should initially be composed of three photons in a dance across the mean and will "decompose" to two photons in a dance across the mean creating an electron positron pair. Decomposition leads to an electron and an electron neutrino. Now the electron neutrino may equate to the expression of the antiverse's release of a photon into deep intergalactic space. There is a long way to go to hone this idea into shape but it - perhaps - holds promise. And it would help explain the observation that it is very improbable that we will interact with antiverse side "photons" although they are only femptometres apart when they first decompose. It is easier, also, to get some sort of surmise on why a rising temperature (electron shell jiggling) leads increasingly to the release of "matter capacitance" as the electron dance is disrupted
- A bit of an aside point: Whenever we measure the SoL we are looking at photons "docking" or "undocking" with electron/positron pairs. The only photons we measure are those that have just the right approach (or exit) from "orbit" around the mimimal distance (defined, once again, by that which is capable of being a stable electron/positron pair). Whilst other "speeds" and smaller distances may be "possible", we may only "see" one speed and once distance minima. Any others will not interact and so remain "invisible" to us. "Superluminal" might be possible but irrelevant to and non-interactive with baryonic matter. I like this as it makes "sense" out of a "need" for an SoL limit. It also gives a hint of how accretions of electron/positron pairs leading on to more and more complex baryonic structures may emerge in a evolving manner. Once a matter capacitor of balanced "electron fleeing" and "positron fleeing" entropy has begun, the apparent time well (low entropy well) can accrete slowly. Now, the idea that gravity represents the "positron fleeing" side of entropy becomes more obvious. Photons are not restricted, perhaps, to any speed of form but will only form time wells (matter capacitors) when they are finely tuned to interact with (and create) electron/positron pairs.
- (**An aside**) Whenever we think around time, we end up with a dualistic contradiction: it takes time to learn a language, to develop a science, to construct a motorway, to build our house; in contrast, time nibbles away at our organisation and constructed order, left unmaintained, decays into a progressive "crumbling" homogenisation. We tend to interpret the constructive side as "intelligent intervention". However, it is clear that - if we could spontaneously generate a very large volume of hydrogen from elementary particles (a firm possibility with "quantum foam" given a large enough arena, or volume, to allow improbable persistences to accrue) then "gravity" will do the rest and gradually gather the primordial gas together, fuse it into higher elements, spew out improbable heavy elements, and create life sustaining solar systems; and all of this without the obvious intervention of an intelligent creator. Indeed, unless an "intelligent creator" set up the initial conditions that then allows for the spontaneous creation of a deep intergalactic "ocean" of quantum foam, there is no further need for any intervention by an intelligent creator. I like to think that the universe is both condensing (coalescing into

matter) and expanding (dissipating into homogenous radiation). If this condensation/dispersion in the matter side of the universe is balanced by dispersion/condensation in an antimatter side of the universe (what seems to us extra-electron shell seems to the antimatter universe to be intra-nuclear), this would neatly tie into "matter capacitance". Matter, then, would be made up of condensing particles from both sides. It may be an observation too far to speculate that matter is constructed from two sets of $^1/_2mv^2$ (a pendular cycle has a static high-potential-energy/zero-kinetic-energy point and a dynamic zero-potential-energy/high-kinetic-energy point that are exactly equal in energy (balanced). Remember that energy gradients form where there are "hotspots" of improbable distributions.

Any "point" where matter accretes involves the creation of standing waves from waves fronts converging on a "pole" from both the matter and antimatter side. This, from the matter side perspective, appears to be a series of wave fronts emanating from the "nucleus" and converging from outer space. From the anti-matter side, the perspective will be reversed. Matter appears by courtesy of a matter capacitor with charges equally balanced across the pole. There are multiple individual poles that gradually accrete when close enough. Being at the "sine wave crossover point" these waves are naturally at their maximum velocity (the SoL) when assessed by a matter apparatus measuring the SoL close to other matter. They are like collapsing/expanding spheres close to the point of minimum size (inner electron shell size) which also corresponds to the statistical mean. Anything that looks smaller is a virtual image of the anti-matter universe seen from the matter universe (and vice versa). This leads to the scenario shown to the left: the wave-fronts move from the outer space direction towards an inner electron shell minimum contraction ("forwards time impression") then back out ("backwards time impression"). This is like a (sine wave) expanding/collapsing (oscillating) sphere of space. It seems likely that a miriad of differing size space oscillators contribute to the final "matter" product in our universe. Anything apparently smaller than the inner electron shell (or thereabouts) could be a virtual image of the opposite "universe" (antimatter for us on the matter side of "time" and matter for those on the anti-matter side of "time"). The outcome of this is that there is a virtual distance (or time) running from the green "mean" to the red "mean" which is, in fact, non existent and could appear to us as "instant" jumps, inflationary periods, wormholes and entanglement. ***Of course***, this leaves the very thorny question of how looking at positron shells "through" the mean (the transition point from matter- to antimatter-universe sides - the narrowest point of the truncated cone on the left) ends up appearing like quarks. However, a number of "anchor points" suggest the effort to resolve this may be worthwhile. Remember: quantum jumps, inflationary physics and entanglement all are all predicated on the fact that time runs inexorably in the big bang, 2000, 2014, future-heat-death-of-the-universe direction. However, at tiny, subatomic scales, we see clear evidence that time is likely to be reversible. The wavefunction equation of the universe appears to be independent of time. It could be that the overlapping truncated cones with an apparent (projected) virtual singularity actually represent a sphere of contracting then expanding spacetime and that time and distance are two appearances of the same basic process when seen from two different perspectives.

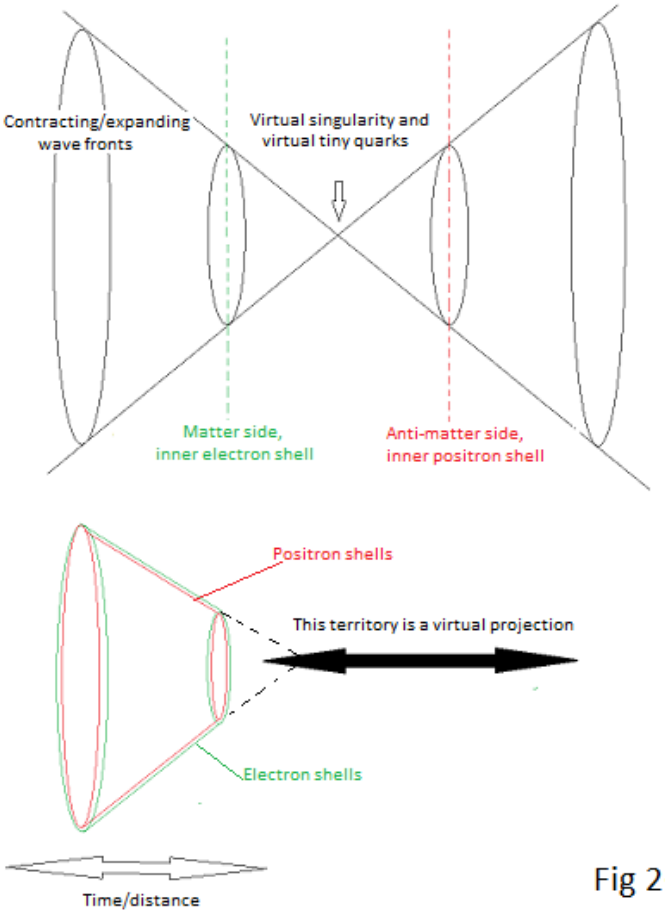


Fig 26

**Revisiting the emergence vs immaculate conception argument:** The current view of the big bang is that it emerged as an infinitesimally small nugget of unbelievably low entropy (a chance event smaller than one punter

winning the Euro Lottery every time it was played for thousands of sequential games - a somewhat improbable event). Not only that, but it has to be perfectly balanced so that errors don't amplify over time. Not only do we have to represent the lucky lottery winner, but It has also to be extremely finely tuned; inflation is one of those tuning mechanisms. Emergence, on the other hand, looks to creating immense complexity from a whole series of trial and error small incremental steps. Biological evolution does it by the persistence of the progeny of survivors. Quantum mechanics may be able to use forward and backward incursions into the time well, with dead ends being "abandoned" as they don't allow the well to deepen. This ends up being rather reminiscent of the multiverse idea but only at the microscopic scale. The macroscopic universe could emerge from the persistence (deep in the time well) of successful microscopic building blocks that discover, better and better, how to accrete into complex baryonic structures. The "multiverse" idea of an almost infinite number of complete macroscopic failures (the not "up to scratch" outcomes) is subtended to but not in the grossly simplistic way that "right next door is a mind bogglingly large number of individual universes with very different structures and laws". As we plunge into the time well, more and more complex structures are able to populate the time well (perhaps, though, not too deep into the time well for life to be unlikely to persist). By my reckoning, electrons (?two phase), muon-electrons (?three phase) and tau-electrons (?five phase) are photons tied into charge balancing oscillations around "now" points. It is clear that the constituent photons occupy very much smaller distances than a free moving photon in deep space (in matter, they are wound up as strings of electrically balanced of see-sawing electromagnetic waves. This wrapping up of distance is probably what turns distance into time (remember, for a photon in a vacuum, distance and time are interchangeable descriptors). This ability for quantum burrowing, forwards and backwards in time (wrapping and unwrapping of distance), opens up the scenario that the system could evolve to burrow into the conditions for its own "causation/creation" cycle.

- **Time:** In a "parish" of extremely low entropy, individual quantum events are probably able to vacillate forwards and backwards with or against the entropy gradient (what we interpret as time). But, the overall process will seem to be overwhelmingly forwards (in time) - ***with*** the entropy gradient (ie, towards extra-electron-shell dispersion). (Because we "start" at an extremely low entropy state compared with deep intergalactic space, we are convinced that all "temporal events" move from the low to the high entropy gradient: the Casamir effect demonstrates that this is a "mass action" and parochial illusion). Oscillating photon waves may be able to "dock" into orbit, temporarily, to form electron positron oscillating pairs and so evolve (emerge) into matter "capacitors" of varying permanence (two phase for electron/positrons; perhaps three phase for muon electrons and their antiparticles; perhaps 5 phase for tau electrons and their antiparticles). Electrons/positrons will have to have the correct (dual) approach velocity to be able to "dock" into a stable charge balanced orbit (rectified so that the matter side looks negative and the antimatter side looks positive - very close but with a very high potential barrier (perhaps - counter - rotational) that keeps them apart and stops their release back into free photons (electron/positron "annihilation"). Once this matter capacitance is broken (matter and anti-matter meet on one side of the "now brane" instead of being stably balanced across its mean) the photons will be released back into photonic radiation (what is generally called annihilation, though it is matter capacitor breakdown). It is very difficult to move from a higher to a lower entropy state (higher improbability state) to reach your anti-matter particle ***through*** the now membrane even though it is extremely close (but this may well eventually happen in "black holes"). It is far easier (a less improbable event) to take the long route round, as photonic radiation that disperses into deep intergalactic space to reach equilibration with its opposite "dice face" partner and so really annihilate to a zero energy nodal point. However, these emerging forays into matter compaction and deeper time wells might eventually lead to matter capacitance breakdown at a black hole event horizon. One important way this capacitance release can occur is through the "Brownian" movement of the electron side with respect to the positron side. Some positrons are shaken free across the now membrane (and vice versa).
- I currently suspect that a photon is a collapsing/expanding ring or sphere of magnetic tension. Perhaps it is a balanced pair of opposite charged ring/spheres that contra- oscillate. Seen from across the mean, the magnetic sphere (wanting to expanding when charged and wanting to collapse when the charge falls to zero) it looks like a very small charged particle (electron positron) because it is travelling away from the magnetic field at the SoL. The magnetic "monopole" is therefore a large charged sphere when seen from the matter side of the mean (vice versa for the antimatter side) and we will never experience a tiny magnetic monopole of significant charge and certainly no smaller than the mean (electron shell size?).
- Two fun quotes:

  - "The fact that we live at the bottom of a deep gravity well, on the surface of a gas covered planet going around a nuclear fireball 90 million miles away and think this to be normal is obviously some indication of how skewed our perspective tends to be." **—** *Douglas Adams, The Salmon of Doubt: Hitchhiking the Galaxy One Last Time*
  - "Space is big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the road to the chemist's, but that's just peanuts to space." **— *Douglas Adams, The Hitchhiker's Guide to the Galaxy***

- I am not sure if I have mentioned this before: In our parish, iron is the most stable atom. We can fuse lighter

elements to release energy (ultimately, free photons) and fission heavier elements to release energy. In deep intergalactic space, perhaps iron has a gradient towards fission. In a neutron star, even uranium will fuse to release energy. Now, this suggests that atomic structure, under the right conditions, keeps on the trend of reducing the ratio of protons to neutrons until it is nearly all neutrons. In this way, compactification goes on and on. The time well gets deeper and deeper. An escaping photon has a long long way to go to reverse this compaction - massively further that our optical inspection might suggest. Hence "time" "slows" and a time well is created.

- **Absolute time:** One thing that became clear with special and general relativity is that there is no absolute time. It is relative to your inertial frame and differs from parish to parish. When two objects are streaking apart near light speed they ***each*** see each other's clock as running slow. But, we still can't resist postulating an ***absolute*** - 13.7 bn yrs in the past - starting point. This is probably a valid ***virtual*** starting point but it strikes me that this will have a great deal of the "virtual" and hide a lot of its real substance and meaning. Indeed, at the margins of an event horizon, the passage of time can come to a halt. So, for this parish, virtually no time has passed since it was first formed yet on small planets around the galaxy centre it seems that billions of years have passed. Inflation, multiverses and the big bang all seem to me to rely on an absolute 1900 -> 2000 direction for time starting from 13.7 bn yrs ago and they assume time cannot go backwards. We know two things: that is wrong at the quantal level; and that it seems overwhelming correct for macroscopic components in our parish dominated by absurdly low entropy. Too many component (quantal) events would need to be strung together in a very precise and unlikely sequence for us to be able to return a breaking egg back, intact, to a table top. It is the extremely unlikely starting point that makes time seem irreversible in our parish. To reverse would necessitate a similar scale of immense improbability.
- Temperature: When we look at an atom as a set of waves that do not ***physically*** (but not virtually) get smaller than a size inside the inner electron orbital and outside the atomic nucleus, then we have a view that can be represented in 2-D as two discs with a central hole (projected into 3-D, it might be viewed as a torus). "Brownian-style" movement will joggle the two disks in different directions. The higher the temperature, the more likely it is that electrons or positrons will occasionally overcome the charge/rotational energy barrier. (Charge is balanced by the proximity of positive and negative charge - the matter capacitor effect; the "dielectric" gap may be created by centrifugal forces counteracting the attraction between the electronic and positronic sides.) Once a positron or electron is shaken out of its atomic parish to go to the other side, the outcome is electron/positron "annihilation" and the release of the constituent photons. So, increasing temperature (molecular joggling) naturally leads to the partial breakdown of the matter-capacitor, loss of mass and radiation of photonic energy out (ultimately) to deep intergalactic space (perhaps with detours - like, *eg*, sun to earth - on the way).
- So a new point to ponder is how this extremely large (dielectric) potential barrier affects the reciprocal disc sides. Physically, they are extremely close; energetically, it can be a large barrier - even an apparent universe apart. The problem now is to figure out how the minimal radius of electron/positron shells (the universal $R_{min}$) can appear to be able to accelerate out to the universal $R_{max}$ where photons finally reach a point of energy dilution where they are unable to transfer quantal energy to this new parish; expansion ceases to exist. Note that this is the essence of light quanta; they are able to "teleport" energy from one location in space to another - having no physical existence at any point in between teleport-start and energy-transfer-finish-points; even though they can be enticed to decohere at any intermediate point (and thus cease to exist at the previous finish point). Perhaps we can envisage it as electric charge that appears to travel in "straight lines" down the throat of the torus and the magnetic "charge" can spread out to the much larger sphere of influence of the whole outer torus. However, if we view the same system from the antiverse side, the electric and magnetic charge and dimensions reverse - implying that they are travelling away from each other (probably rotationally) at the speed of light (contra-rotating or contra-expanding/contracting in some way). In this view a photon might be a "contra-rotating" pair of electromagnetic spheres (or 2-D discs - remember light polarisation) that are, in reality, spatial magnetic spheres/discs that are expanding and collapsing through each other (but see the afterthought below) and inverting (bladder like) in the process. Note what happens here. The disc can occupy a number of states. At one part of the cycle, expanding into "outer space" (the universe side) gives the disc "margin" an increasingly positive charge which then resists its continuing expansion "outwards" (feel how two magnets aligned in a continuous N-S, N-S or S-N, S-N direction try to close out the space between them). Continuing with this expanding/contracting cycle, the photon disc goes on to contract into "inner space" (the anti-verse side - but seen from the antiverse side it is expanding out towards a similar - [just] perhaps the same - deep intergalactic space where the mixing of the two sides would lead to a nodal annihilation that results in a zero energy [high probability] state). So, first it enlarges (into "outer" space) creating a positive charge (a large magnetic "monopole charge") and then it expands into "inner" space (to us apparently/virtually within the atom) with a negative electrical charge (an electron "monopole charge"). This happens as a balanced pair for electrons (triplets for muons and etc?). This looks small because it is initially receding at the the sol as its charge grows. The outer space expansion looks like distance to us, the inner space expansion looks like time; for all photons in a vaccuum, time taken and distance travelled are interchangeable and constant. So time can be reinterpreted as virtual distance within "inner space" - or "real" distance when seen from the antiverse side. "Travel" becomes the step by step possible incremental/decrimental states that can be exactly occupied by exact integer multiples/divisions of

smaller/larger states (what we interpret as resonant/standing waves). The more steps necessary, the longer the "time" taken. I suspect it is something like this.

- Note that this perception of an increasing charge at the "margin", as space gets larger, obviates the need for a stable pair to create the oscillating disc - it will happen whenever there is an initial "perturbation" of nothing into expanding inner or outer space. Energy is lent then repaid in a pendular oscillating fashion and "outer space" represents our forward in time and "inner space" represents our virtual (not real) backwards in time. But, in reality they are both leading from an deep time well (photon compaction) that has evolved in slingshot fashion (persistence of the survivors) back to a timeless ("unwound") "ocean" of quantum foam. Perturbations are always a net zero - equivalent to the opposite sides of +3, +2, +1, -1, -2, -3 dice seen from the top or underneath of a glass table; the reciprocal sides are ***always*** in perfect balance, however many dice are thrown, though a single surface distribution (eg, table top) can look quite random and demonstrate, in regions, large statistical improbabilities, even though the overall average - particularly when large numbers of dice are thrown - approach the same overall zero "charge". We have to work out the "God" bit here. Here I am using "God" very metaphorically and certainly not with any allusion to "Him" actually existing. Why is there a fundamental uncertainty/jitteriness from which nothing can "eventually" produce all the baryonic matter that we are so aware of in our surrounding universe? It may be that it is the fundamental reversibility of time that allows the emergence/evolution of our existence in what appears to us to be an immutable "13.7 billion years ago to now" time direction. It can joggle forwards and backwards as macroscopic (mega-scopic!) structures "progressively" emerge in a balanced mirror image. But note where beings who are intelligent enough to manipulate an understanding of the universe have emerged; it is probably not in deep intergalactic space; it is probably not immediately surrounding a black hole; it is probably not (simultaneously) physically and temporally close to any supernova explosions; it is probably not too close or too far from a star; it probably ***is*** in the the outskirts of a galaxy; and it does depend upon our constituent particles (making up our atoms and molecules) having been spewed out in a supernova explosion. For life to persist, it probably needs to stay close to these conditions and to climb an order (morphostatic) gradient that is constantly subject to the attrition induced by the entropy gradient of the parish we occupy. This entropy gradient dictates the direction of our apparent time.
- **An aside:** Time and accurate atomic clocks. Physicists are constantly inventing more and more accurate atomic clocks. At first glance, this suggests that the passage of time is absolute. However, when we say a new atomic clock does not gain or lose a second in 300 million years, what we mean is that we can build a group of these clocks, side by side and held in the same physical conditions (ie, as close as is possible, held in the same inertial frame) and these clocks will stay accurate, respective to each other, to this degree of accuracy. Putting one of these clocks on a rocket and sending it into a distant orbit around the earth will completely alter things (eg, as in satellite navigation technology). How fast a clock runs, compared to the grounded ones, depends entirely upon its inertial frame. On approaching a black hole event horizon it would appear - to us - to get closer and closer to stopping.

**Inner-outer space:** Reconsider some earlier diagrams; Fig 17 (light cones), Fig 19 (De Sitter space), Fig 26 (the virtual singularity) and Fig 7 (the now point, the past and the future). Also, reconsider these looking at Fig 27. First, reconsider De Sitter space. It shows it in Fig 19 as a progression from past to future with a minimal contraction - there is no zero size point. Now, imagine a wavefront that emanates out from the pink minimum-[unable to get smaller]-space (the De Sitter "crossover" point in Fig 27) as a radiation that then spreads out to deep inter-galactic space. Or it can converge to the De Sitter point from the other direction (though there is not much that radiates in deep intergalactic space other than quantum foam and any reflective waves from the inner space - antiverse - side; this assumes that an expanding/contracting cycle is possible). Light can travel on this wave as photonic radiation moving at a maximal speed, the speed of light in a vacuum (c 300,000 km/sec). In this state it is virtually all given over to distance and little is traded into time. However, from a photon's perspective, the distance travelled is foreshortened and the time taken to travel even large distances is effectively zero. In deep intergalactic space, which is populated almost entirely of infra-red photonic radiation, this dominant population will not "perceive" it as the vast arena we, baryonic beings, perceive it to be. A dominant time direction ceases to exist here because the entropy of this arena has reached a maximum. Apart from very distant matter (a tiny fraction of our universe) homogenisation has here has reached its most complete state. No potential gradient is available to drive energetic reactions and give rise to macrostructures. Seen from the outer space (universe) side of the De Sitter crossover (where a wave first contracts down to the mean then expands back out, through "inner space" and the antiverse to deep intergalactic space), all distance on the "inner space" side looks to be made up almost entirely of time (but only when "close" to a De Sitter point). The apparent distance outwards, towards deep intergalactic space, is apparently contracted down to something about the De Sitter "hole" size. This whole scenario is reversed for an inhabitant outside the De Sitter point on the anti-verse side. This is entirely consistent with the antiverse side moving away from us at the speed of light. Rotational discs might be one way that this is realised. Whatever, the wavefronts come in from outer space towards the De Sitter point (and there are swarms of these) look like large (probably magnetic) "strings" that "want" to contract to a minimum size (around inner atomic electron shell size). They bounce out (reflected from this point) as tiny electric charges. Seen from the other side, it is the electric chanrges that are large and the magnetic string that is tiny; effectively, a magnetic "monopole" looks like an electric charge when seen across the De Sitter divide. Thus, this means that, across the De Sitter mean (that cannot get smaller point) distance - effectively - makes a right angular diversion into time (though both are distance but viewed across the De Sitter divide. Now, this means that electric charge is spread around the surface of the De Sitter minimal (atomic) sphere as seen from the "outer space" side; the nucleus, which is made from the antiverse, "inner space" side, is a positronic mirror image of the atomic electron orbitals. However, their charge is concentrated into the same sphere and - I suspect - we have a situation where we have to balance the average unit surface charge of the electron shell with the average unit volume charge of the inner space side ($1/4\pi r2$ constructs on the "outer space" De Sitter surface and $3/4\pi r3$ constructs on the "inner space" De Sitter virtual sphere. Because persistence is prolonged (distance forfeited to a deeper time well) and distance is greatly foreshortened, more complex structures may be virtually "created" - but a satifying explanation escapes me yet. Remember, distance is "traded" (virtually) for "persistence" - though, of course, the perspective is inverted on the other side. I thinks this holds great promise though it is far from a solidly satisfying explanation as it currently stands. It does hold out some promise for reinterpreting what - for example - neutrinos represent. Perhaps antiverse photons (this would explain their slight mass). Electrons have slight mass too; that may be because they are - at least partly "over the border". It is also a nice new perspective on light experiments. Photonic "particles" are largely the property of the small alternating electrical charge travelling forward in time to the "target". Photonic waves are largely big alternating magnetic "charges" travelling the return journey from the target to arrive before the electrical particles left.

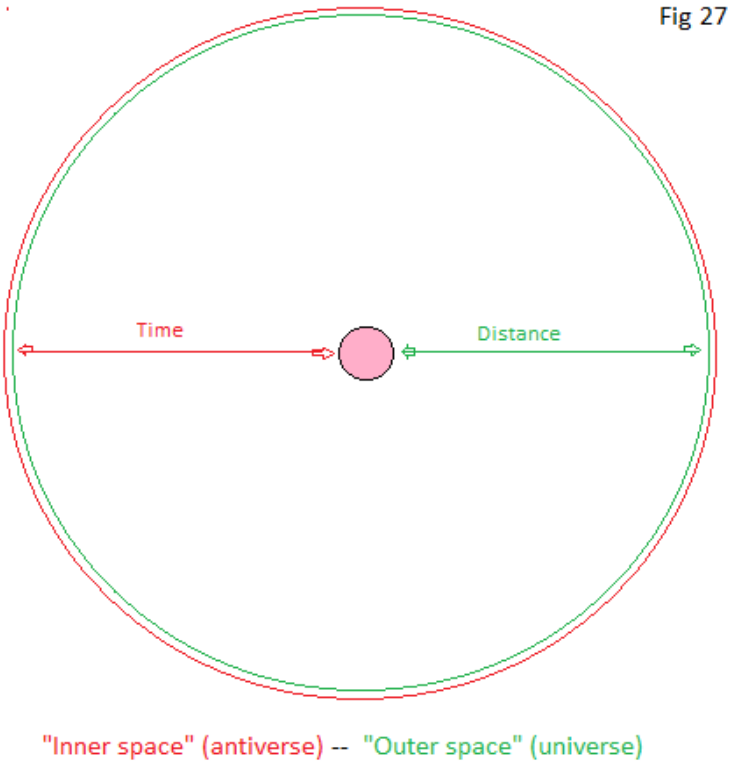


Fig 27

Note that, to create an electron, the magnetic contracting wave front reaches the electron shell at the SoL. Once

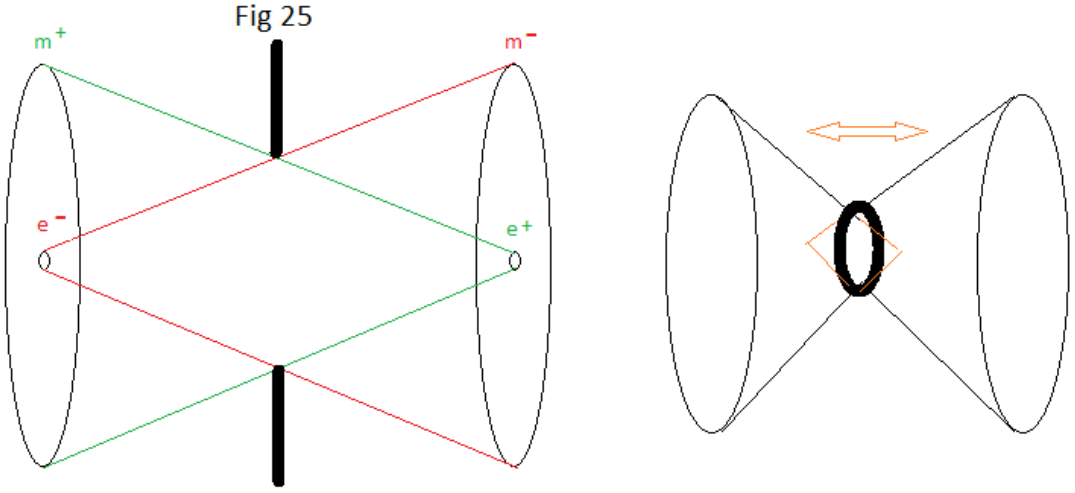
through and inverted, it is moving at the SoL in the opposite direction. The converging speed is twice the SoL. That means (see below) the receding magnetic front cannot interact with the standing wave of an electron (on the universe side) to dock with it and dislodge photons from an electron shell (this is how we measure the SoL - it always complies with an SoL approach of departure). This non-interactibility may be an important part of the massive matter-capacitor-dielectric.

- Now - gravity as acceleration: Effectively, gravity is like the centre of the earth accelerating out to the surface of the earth driven by a constant 1G rocket motor. As time runs slower at the centre of the earth than at its surface, any rotational movement of earth around a deeper time well (eg, sun then galactic centre of mass) results in a constant effective acceleration of the centre of mass of the earth relative to its surface. The transitioning from "outer space" to "inner space" through the De Sitter minimum is occurring through increasingly confluent hordes of De Sitter spaces as we move to higher and higher mass structures, reaching an extreme at a black hole event horizon. In the earlier article on entropy, towards its end, I have referred to gravity as a apparent entropic dispersion/homogenisation running in the (apparent) opposite time direction to the infra-red photonic dispersion we immediately associate with entropy. "Apparent" because we perceive it as accreting towards the centre of mass whereas it is, actually, photonic dispersion to deep intergalactic space through the antiverse side.
- ***Now, the hint of something possible - but only a hint***: I have already regarded the electron as, potentially, a two phase latch up of two photonic space/disc oscillations that are formed when two opposing (inner and outer space) photons approach each other at just the right speed and, perhaps, offset so that they "dock" into a stable mutual "orbital";. They are, effectively two strings (disc like or sphere like) electromagnetic charges. When space is created (outward expansion) a peripheral charge increases that then acts as a progressive dampening force to expansion. Seen as a manifestation of "inner space" it looks like a tiny electric charge, seen as a manifestation of outer space it acts like a far larger magnetic force pulling along the periphery of the disc/sphere to reverse the the expansion into the space it created/encompassed. Now, as we move out from the inner De Sitter space towards deep intergalactic space, the entropic gradient changes from very low entropy for each individual "inner" or "outer" space (antiverse - universe) side towards maximal high entropy at the point where "dilution" renders the energy of each photon insufficient to transfer energy from the De Sitter point to the periphery of deep intergalactic space - and expansion ceases. This can be envisaged on a sine wave representation of an oscillating/expanding/contracting spatial distension. As the spatial sphere expands towards "outer space", surface negative charge increases, slowing down the expansion until it reverses and the charge falls. It reaches the De Sitter point at the speed of light. At this point it has no charge but it has maximal kinetic energy so, it reflects out again from the De Sitter minimum space at the SoL (just like a mirror - or extremely dense refractor) but now with its charge reversed. So the inner and outer space actually occupy the same space but move relative to each other at the speed of light (the approach and departure to the De Sitter point might be one at one half of the speed of light to maintain a speed of light limit). The electrical charge of the stable electron/positron oscillator pairs will apparently be rectified across the De Sitter margin in a saw tooth fashion so that it looks like a constant negative charge on the "outer" margin and a positive charge on the inner (could "spin half" be related?). Now, near the De Sitter crossover, it is possible that the spatial geography of the transition favours a very temporary dive into a three phase photon dance (muon-electrons). And, if higher dimensionality occurs here then there is room for a five phase dance (tau-electron) and perhaps a seven-phase or even higher dance. But, the higher the phase dance, the higher the mass, the higher the energy and the rarer the event. Now, could neutrinos be the manifestion of a photon or even an electron/positron pair when seen from the other side of the De Sitter minima? It is just possible that the Higgs might be a manifestation of the existence of a seven-phase-electron. Perhaps this is worth persuit. (Nb: the sine wave analogy suggests movement in time but, in reality it is the distance ratio of "inner" and "outer" De Sitter space with the distance seen "through" De Sitter space as time: and, of course, this looks the opposite from the other side: no actual time flows - this is illusory.) Using a reductio ab adsudam argument, as conditions get more extreme through neutron stars then inside an event horizon, it could be that higher and higher primes of photon dances occur and way beyond the postulated 3-phase, 5-phase and 7-phase electrons I have postulated. I will call these e#1 (photon), e#2 (electron), e#3 (muon electron), e#5 (tau electron), e#7 (unnamed from now on), e#11, e#13, e#17, e#19, e#23 etc. Now, the speed of capture and escape into a stable dance should fall with progressively large numbers. This will reflect increasing compaction of higher numbers of component photons into orbital dances and also be reflected into a deeper time well. Ultimately, that time well may approach the point that time ceases to flow from our perspective. From the hypothetical big bang ("time zero") to our now (+13.7 bn years) virtually no time has passed from its perspective.
- Now, instantaneous jumps from one stable dance to another can occur in true photon form (it can be across the universe in an instant from its perspective) rather than perceived photon form (where we perceive it is limited to the SoL - because we rely on its decoherence into electron shells to measure its speed and entry and exit into "photon dance" orbitals are restricted to the SoL). In going from e#n to e#n-1, photons are released. Except for the special case of an electon into a photon (1) all other reductions in "prime-dances" release multiples of 2 or more photons (an electron or positron - depending on which side of the de Sitter "now" point this occurs). A very high proportion of these will be end up as electron/positron pairs. We now have a situation where, as we approach the de Sitter throat, an increasing intense but still virtual black hole / big bang singularity is approached as greater compaction

evolves (in a forward and backward in "time" testing out of possible compaction occurs.

- Although tau electrons are evanescent "creatures" that last a far shorter time (distance) than electrons, in the extreme time well of a black hole event horizon, even e#n (where n is a very large number) will appear, to us,to persist for long periods of time. Remember, time is really distance (on the “other side”) perceived through the de Sitter bottleneck (which should, in fact, be a reflection rather than a tunnel).
- So ..... Let's look at what the view is from the universe and antiverse sides. The photonic oscillation is made up of an "oscillating" disc (perhaps sphere). Perhaps it is not oscillating in any absolute time sense. It may just have

Fig 25




Matter side view
m = "magnetic"
e = electron

Antimatter side view
The $m^+$ is projected to $e^+$ and
the $m^-$ is projected to $e^-$

representative sizes that each have a probability of being realised at any moment that energy (improbability) is "teleported" from one place to another. The spatial extent (represented by a magnetic "string") on the universe side is positively charged and negatively charged on the antiverse side. Each sees its receding "partner" as a tiny electron or positron (opposite charge). What seems to us to be electron dense matter (forming also the nuclear components) is projecting towards a singularity. Our magnetic sphere could be "universe wide" and so in deep intergalactic space. Although they have been drawn as cones opposing one another, they are really superimposed spheres with the universe and antiverse components of the wave always close to each other but, the opposite side always projecting a virtual "singularity" or tiny particle. The ring of the electron shell is probably an "elongated tube" with the electron being just within the left side of the tube and the atomic nucleus just within the right side of the "now" tube (though this tube is, in reality, just a virtual entity caused by the time well).

- Distance and time are relativistic reflections of each other. From the universe side, antiverse distance looks like time and from the antiverse side, universe distance kooks like time. Thus, although the nucleus appears to be within an electron shell, it is really the whole antiverse through a "peep hole". The distance between the galactic centre of the antiverse and the antiverse positron shell may be the same as the universe distance but it appears to us as a progressively deeper time well (from positron shell to galactic centre of the antiverse). This effect means that positronic shell appears to us as being within the past. Reducing this to an extreme suggests that the distance between the nucleus of one of the atoms in our body appears to be a tiny distance from the galactic centre as all its apparent distance has been traded into time. In the same foreshortening way, a photon released at the (virtual) big bang will appear a long way away from us but this photon will feel minimal time passage on the journey. (This is all vague yet but it seems it may help to tie things together.)

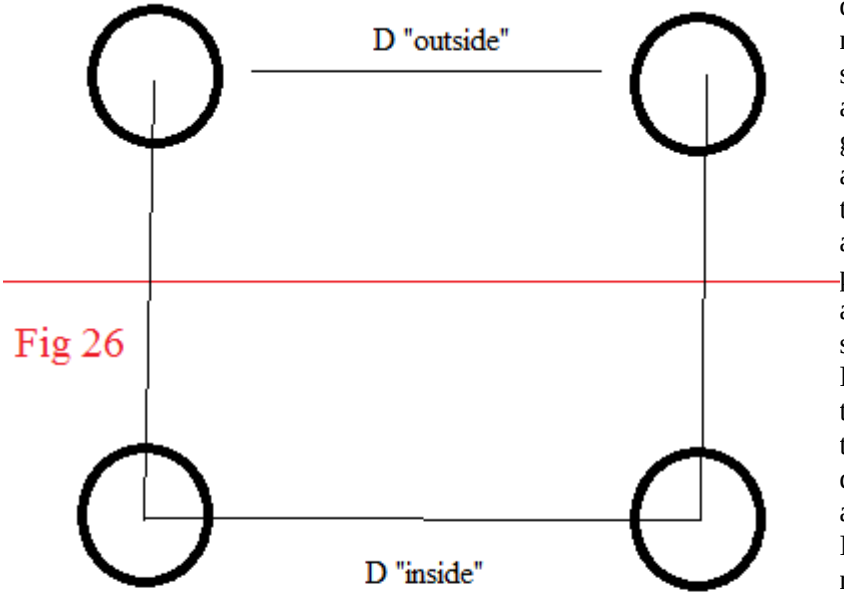



Fig 26

D "outside" nearly all distance, virtually no time.
D "inside" nearly all time, virtually no distance.

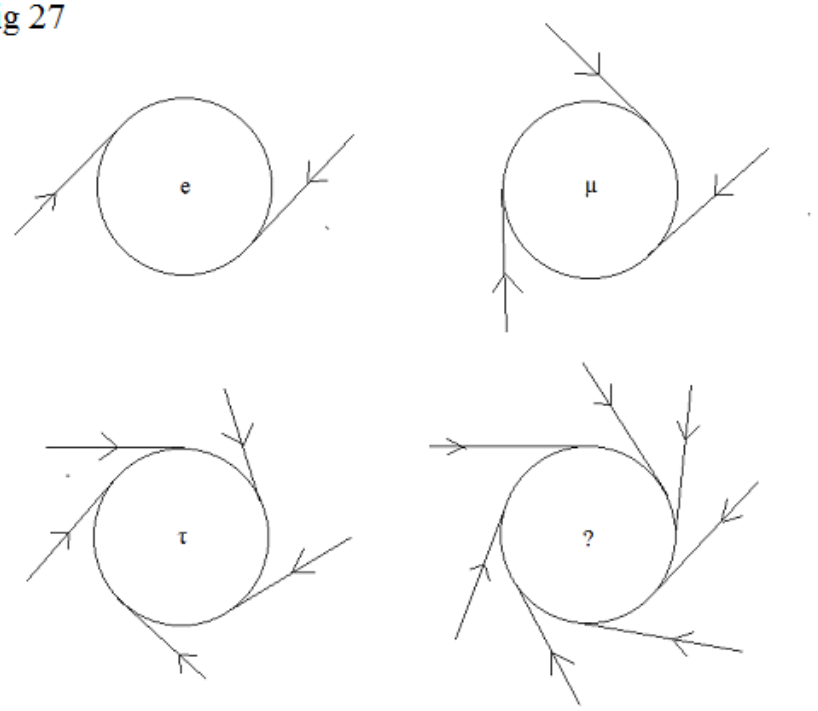
"Outside" is extra electron shell, "inside" is intra nuclear
The universe and antiverse views are inverted.

- Should all this be justified supposition then one thing that follows is that time also has three dimensions even though we remain oblivious to this. Perhaps the one place where it should be most apparent is in rotating systems and within the properties of gyroscopes.
- One fresh thought is that quantum jumps occur in a strict sequence. If all possible vibrational systems come from integer harmonics (decoherence involves quantum jumps into harmonics) then we could view the particle universe as a series of "onion skin" possible harmonic configurations starting with 1 then 2 then 3 then 5 then 7 and etc. The non primes are just embroidered instances of prime number harmonics in a Fourier fashion. Perhaps, just perhaps, these skins form a universe/antiverse dual set of onion skins running in opposite directions in which matter capacitance occurs as a matrix rather than just a geometric apposition.
- Just returning to an earlier point: higher energies represent higher improbable distributions. However, rather than the complex improbability that occurs when we create the intricacies of a modern microprocessor (in which everything has to remain in precise order - "information"), this improbability is in the focalisation of gradients. So, all the gas molecules in a box might be pushed into a corner of a box (and somehow - temporarily contained in this state): it is an improbability dominantly of compression rather than information. Or we might pack electric charge into a capacitor where - at a distance - the dielectric hides the high potential. The atomic capacitor is an excellent storage vehicle with the stability of this improbability lasting for long periods of time and its discharge resisted by balanced forces. So energy is an improbable compaction and stabilisation (eg, petrol, atomic energy). Because, "on the antiverse side", distance is perceived by us as time, opposite charges might appear to be very close but a long time away - food for conjecture.
- 

Creation of various electrons: When we consider that a photon is an oscillating electromagnetic sphere (as above) going from "outer" space (negative charge tension) to "inner" space (positive charge tension) in a balanced way (sum zero about the mean), then we can imagine what may happen if two or more of these approach each other in a close encounter (it won't be a collision but a near miss that can allow them to go

into an orbital configuration indeed - in a collision they might just pass through one another). The relative speeds and angles of approach are critical. There is likely to be a particular combination "lock" that is - "Goldilocks fashion"- just right. This would allow the formation of an electron/positron "pair" (really, looking like an electron and one side of the mean (transition from "inner" to "outer" space) and a positron on the other). So, this precise encounter is a concentrated improbability (raised energy state). Even more improbable, though, is a triplet approach (perhaps this is what constitutes a muon-electron). More improbable still is a stable quintet encounter (perhaps constituting a tau-electron). And so on to a seven photon "dance" ***(even, perhaps many more*** **-** but only primes as non-primes are superimposed primes). My suspicion is that both the orbital dimension and the approach speed will reduce with increasing numbers of "entangled" photons. The speed of light when entering and leaving these orbits should be much slower here - like what we observe at the margins of a black hole (we know light can, in special circumstances - eg Bose Einstein condensates - go slower than the 300,000 km/sec). I think that developing this idea could be productive; proving or disproving a triphasic photon nature of a muon might not be too difficult to establish and we would only need to confirm this particular case to conclude that the tau-electron and "others" probably occupy an analogous structure. That has implications for the frequency of galaxies in the universe and then the relativistic "convergence" of singularities into a single unifying singularity (big bang style). In the ultimate extreme of a "big bang" state "singularity", the central "large number-prime"-electron might be made up of a very large number of photons in an orbital dance. Their persistence outside of this immediate parish would be vanishingly brief but energetic. However, (from our perspective) their persistence may be much prolonged close to a singularity. Because the fundamental property of a photon has a positive and a negative (2-D) "side", these composite pairs, triplets, quintets and etc will form rectified (ordinary, muon, tau) electrons across the "inner"/"outer" space mean. As the disc/sphere contracts towards the minimum dimension it will be travelling away from "us" at the SoL, and when at its maximum size it will be travelling at our speed. At our speed the oscillation will appear like a large magnetic field (a large monopole) and as it travels towards or just through the mean it will appear to be tiny (because it is then travelling at the - electron dictated - SoL).

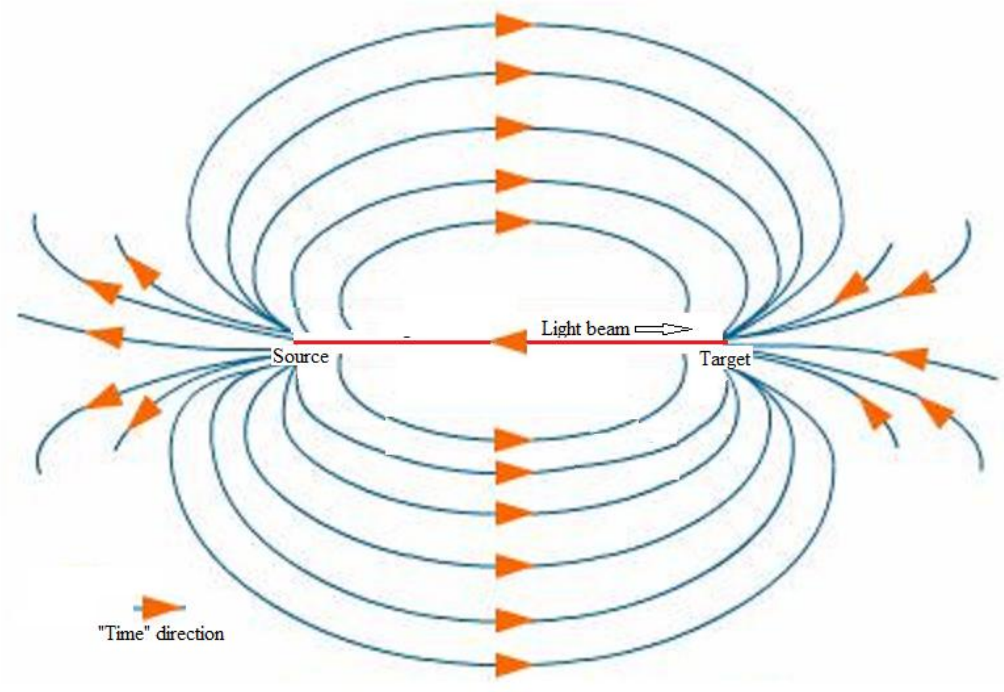
Fig 27




- Returning to fundamentals: if a photon is an expanding contracting disc/sphere of spatial projection, then what is it that it is "travelling" along? If we could halt its forward movement we would end up with pulsating ball that expands, contracts, everts, expands, contracts, inverts, expands, contracts, everts, expands, contracts, inverts and so on. But this expansion/contraction is a 720 degree (not a 360 degree) event centred around an electron shell minima. The 1-360 degree phase represents the electron shell to large spatial universe "sphere" and the 361-720 represent the positron shell to large antiverse "sphere. Logic would seem to dictate that they occupy the same space at different times (time being distance seen from the opposite side). The first pass is into positive time, the second into negative time. Once it "moves along" some "corridor" (perhaps a large spatial expanding/contracting sphere) the illusion is that time passes more quickly at one point of the sine wave, then more slowly at the next - in a pendular fashion. But, courtesy of the larger spatial sphere, the composite sine wave seems to remain in forward time from our perspective. Transferring this into a scenario that sees the electron shell lying very close to the spatial minima, then the electrons with which we interact are "travelling" into the future and the positrons that balance them are "travelling" into the past. The universe would be made up of onion skins of large magnetic monopoles that have occurred by "borrowing" improbability in an exactly balanced time forward / time backward fashion that truly annihilate to absolute "zilch" when they come back to time zero (in total contrast to what we normally call matter antimatter annihilation which is just a complete breakdown of the matter capacitor to release photons from their compacted entanglement. We need to remember that the time bit is an illusion - it is really the way we perceive distance on the opposite side of the mean (universe/antiverse sides).
- Here's a fascinating thought. If an electron is made up of two photons in some sort of dance with each other, then

the following might apply. If they are in a "dance", they are probably oscillating (relativistically - close to the SoL) with each other. Their "universe" and "antiverse" phases may appear to lie very close indeed (a highly efficient dielectric distance) but, since distance on the opposite side appears to be time, there is a phase lag in the virtual and real positions of the "dancing" partners which could aid the capacitative effect, allowing close physical approximation but averting merger and a radiative collapse of the charged "capactitor". What we see when we perceive an electron is the rectified "universe" side of a pair of "dancing" photons and this may be how electron-positron pairs arise. The positron appears as the rectified "particle" when viewed from the "antiverse" side. So, the rectifing principle is probably "time" (distance on the other side) - the electron sawtooth and the positron sawtooth (bridge-rectified sine waves) are thus separated by substantial time differences (ultimately, perhaps, all of the "big bang" to "black hole" time interval). Somehow, when viewed from the "universe" side, the positrons give rise to quarks (so they appear to be intra-electron shell). Is it possible to devise a metaphorical scheme for this metamorphosis of positrons to quarks that can be supported by the maths? It may be worth someone trying. On the odd occasion when an electron-positron pair is fully transplanted into our "universe" side there is a brief existence before radiative disintegration into photons occurs (usually called annihilation - a misnomer).

- This all seems to be pointing towards each photon occupying a tiny, relativistic positive/negative charged and local phase (electric oscillation) and a large non-relativistic magnetic sphere of universal proportions. Tiny uncertainties in the position of these large magnetic "spheres" may have a dramatic impact on the position of their paired electric charge which result in a restoring force and a sustained oscillation. One implication of this is that there can be a unitary charge - all photons and electrons (apparently tiny "antiverse" magnetic monoples which are - in reality - very large on the antiverse side) thus have a universal integer charge. This is vague logic at the moment.
- When we consider a photon as a composite of a large magnetic wave (non-relativistic - so it is big) and a tiny electric wave (small because it is relativistic - moving "away" at SoL) then some further observations can be made. Remember that the 2nd diagram is rotated 90 degrees relative to the first. Ignore the arrow directions for now. The torus tube corresponds to the light beam and the torus extent corresponds to the magnetic wave distribution. The path of the beam through a vacuum, away from anything massive, is straight lining. (The antiverse perspective is - again - inverted.) The moment that any matter (for example glass) intervenes then the path become convoluted and probably "dives in and out" of electron, muon, tau and etc "dances" (where it comes across these - mostly electrons in our parish). In a vacuum, the distance from source to target corresponds to time (at the SoL) and the two "mean" the same in this instance. In glass, the total distance is probably the same but convoluted; from our perspective it travels a smaller distance in the set time. Matter foreshortens the apparent distance that the source and target are apart. So, transposing this perspective to a photon that travels from "big bang" to "black hole" just through a vacuum and comparing it with a photon




Components of a photonic wave seen from the matter side

that dives into matter (like the baryons on mother earth) the distance from "big bang" to us will be the same as that from us to the galactic centre but it is convoluted and it passes "through" the electron shell. The further out from the "black hole" we are, the apparently longer is the "wormhole" that foreshortens the apparent distance. With two singularities close together, this wormhole appears - to us - to be shorter still.

- One thing that now seems clearer is that, with an oscillating pair of expanding contracting spatial spheres, is that it is clearer why the magnetic phase seems large and the electrical phase seems small. Return to figure 7 and see that the "antiverse" side is effectively receding from us at the SoL. We humans and our experiments view the process as part of the wound up matter where the electrons and the nuclear matter are effectively diving down towards and through the electron shell (albeit as a rotational speed for the electrons). When we see an electron or a magnetic field we are experiencing a rectified pair of oscillating photons - we only see the negative side and, thus, a constant negative charge. The positive side is "on the antiverse side" and constitutes (somehow) the nucleus and its constituent quarks. The deeper we dive towards greater compaction (really photons going round and round in loops rather than streaking across the deep intergalactic void) the slower is the speed of light - time appears to to an "outside" observer to go slower and slower within this compaction. So, when we see them, electrons and positrons are moving away from us at the SoL (we don't often "see" positrons). These belong to that dive through but still very close to the "mean" (which I have assumed is somewhere between electron shell and the position of the nucleus) at which point the "velocity" (relative to us) is high. When we see a magnetic field it is a large electrical monopole that surrounds us (the positrons sensed from the universe side). Both the universe side, positive "exterior" charged electrical monopole (experienced by us as a magnetic field) and the antiverse side, negative charged electrical monopole are static with respect to us. This contrasts with the electron/positron monopoles which are rushing into/through the mean at the SoL) relative to us. The magnetic bit is the oscillating photon pair perceived when they are not rushing away from us (they are at the peak - maximum expansion - of their co-ordinated expansion contraction dance) and the electrical bit is when it is rushing away from us (at the the nadir of the contraction phase to "zero size" - inverted commas because there is a minimum, quantal, non-zero contraction size). The difference between the universe and antiverse sides is that that are at different times - which helps to maintain the "dielectric" gap. Remember, the photon dance is of an expanding contracting ball of space that creates a charge tension at its "periphery" that increases the repulsion and thus acts as a restoring force. The dancing electron(positron) pair are positively charged into the past and negatively charged into the future. The electron, therefore, always seems to be balanced by a positron and both are the "apparent" rectified halves of the two photons. But, ultimately, the manifestations are just a manifestation of a two photon dance that looks different according to your perspective of viewing the pair.
- Hhhhhmmmm:!!! I have been more than thick on this one. Hark back to fig 27 and my "close encounter". Idiot. Exact encounter - just with the right conditions, frequency, improbability and phase. They travel exactly through each other. Apart from the phase difference, they are in exactly the same place. There need not be any actual movement, just a mathematical probability of being in balance at every possible point in this arena. We can think of it as time but time is just (as below) the relative number of in out "bounces" and probability states that can potentially be occupied. They are (quantum minima "excepted") exactly superimposed. As the pair "expand" out (remember, really a probability description) the "surface tension increases" (positive or negative charge depending on whether they are on the universe or antiverse side) and this acts as the the "brake". As they "accelerate" back, they are (at the mean) "receding" from us at the SoL (so they look very small - this is at the maximum kinetic energy point of the photon dance. Because they cross the mean, we only "see" the universe (not the antiverse) side of this photon pair - to us they seem to be buried in the nucleus. During the antiverse excursion, they act like positrons. However, an electron is just a bridge rectified pair of oscillating photons seen from the universe side. Vice versa for the positron. If they are created "ex nihilo" with just two "colliding" photons, then they are created around the mean. We never see the positronic nature of the photon on the universe side. It remains buried in "our (virtual) nucleus". However, if they are created away from the mean (high energy [=high frequency/low probability] photons colliding with lead), then we see the positron appear also on the universe side. A perfect "docking" approach at the mean is much more probable for two photons 180 degrees out of phase - than for three that are 120 degrees out of phase - than for five that are all 72 degrees out of phase. And et sequitor. Now, the higher the prime number of photons that become engaged in a balanced phase dance gets, the greater is the compaction of matter (capacitance). There is "further to travel" albeit this travel is back and forth rather than straight from "big bang" to "black hole". If I am right, the big bang is just a sum agglomeration of black holes on the antiverse side (so they look - to us - like a very focused singularlity). Time becomes "back and forth" distance. Time is also, in reality, just a comparative probability table. (Hey this is fun !!).
- Now, thanks to Yannis F. Missirlis (who I had the pleasure of sitting next to in Paris this last two days) he made me think about morphostasis. Is it morpho-stasis or morpho-dynamics? This led to my own bit of extension in that the body is in a state of morpho-dynamic funneling (or even tunneling - things appear to stay static but it is in a series of frenetic exchanges that look - from a distance - like stasis). Wow - now that fits with figure 7 where the universe's matter and the antiverse's matter (capacitor) is a process of morpho-dynamic funneling. But - it's not a funnel. It's a reflection: and it's a reflection because the refractive index at the core (intra-electron shell mean) is

near enough infinite. The approach would have to be so unbelievably close to 90 degrees that virtually no photons ever go through at the very depth of a singularity. But, they might go through lead if there is a very small anglular deviation from 90 degrees. They could go through as photon pairs or as triplets (and etc). Ooooooooo : could that be a neutrino? That means, it could ignore the local mean which appears as part of a large block of lead or of an earth sized object. That needs thinking through. I can see objections already. Whatever, because of reflection from a high refractive index surface (what we appreciate as the arena enclosing an atomic nucleus), it is not a funnel but an universe-in antiverse-out reflection (and vice versa - we would appreciate it as being locked within the nucleus). So, the kinetic phase (photon wave reaching the mean at the SoL) means that it instantly changes its inward "motion" at the SoL - as a "spin half" part of an electron - to an outward motion at the SoL - as a "spin half" part of a positron. Does that mean that when we look at a mirror what we see instantly reflected back is the other half of the photon pair? That sounds good. The phase shift - I think - might fit with that. It isn't actually reflected - it is just a mutual "exchange" of information.

- A new perspective: I have assumed that the natural state of "nothingness" is disturbed "at a point" and expands out (as a quantum foam event) in equal amounts of positive and negative energy before annihilation back to nothing. However, that would be somewhere specific in the void. The alternative view is that it is disturbed, uncertainty fashion, "everywhere" and "focuses" in towards a point. Its momentum/velocity, however, is clearly defined. So, could quantum foam perturbations appear, ***uncertain***ly, from all over - at once - and compact down towards a ***certain*** point. At generation, its surface tension (charge) is distributed, weakly, all over but as it compacts, so the charge is progressively concentrated into a smaller and smaller spherical(ish) surface. This results in a repulsive restoring force (like charges repel) UNLESS there is the intervention of an averaging-out of positive and negative charges by a matter capacitor (matter: electrons, hydrogen, carbon etc). So, far from exploding from a very small sized point, matter (and the time well it creates) may be condensing out of uncertainty of position. The evolution of increasing quantities of matter (electron, hydrogen, carbon, iron, uranium, neutron star, black hole) must be by small progressive - mostly non-saltatory - understandable steps: there will be no jumbo jets spontaneously flying together from their component parts. That is the essence of evolution. We should be able to see the progression as relatively probable chance events - just as in biological evolution. So matter condenses, from photonic pulses, out of the "uncertain" void and "builds" time wells.
- The theory of inflation - if inflation was real rather than virtual - demands that an almost infinitely dense singularity "explodes" out so evenly that 13.7 bn years later, the background radiation left over from it varies in temperature by the tiniest of fluctuations. To my naive interpetation, inflation gets over this in what is arguably a colossal fudge. We create a scenario that demands an almost unbelievably brief period of colossal x colossal x colossal spatial expansion. This is applying the Goldilocks principle (just right) in an extreme way. And we haven't yet added the improbability that such an extremely improbable, low entropy, event occurs spontaneously - by chance (several billion jumbo jets flying together simultaneously and spontaneously from their component parts). Such a chance event will be accompanied by a galactic number of "near misses": where are they. The alternative is that the "creation" sequence has reflected itself (fractal like) in biological evolution; a multitude of graduated smaller and individually more probable steps.
- Here is some thought on "photon packets" (photon-pkt). It is clear (emphasised by Planck then Einstein) that photon-pkts come as indivisible quanta. Either there is enough energy (concentrated improbability) to release a photon-pkt or it simply fails to form (= exist). I suspect that these quantal packets actually represent one completed cycle. Quantal trains may occur where wavefronts of multiple, coincident photon-pkts are released (parallel multiple quanta) or when serial cycling occurs - rather like the hand driven trucks featured in old west movies that can be "pumped" along the railway (without friction or gradient; the intial power input over one cycle - potential energy converted to kinetic energy - would see it to its destination where the motive power can then be returned from kinetic to potential energy). Concentrated improbability can thus be transmitted - lossless - from one point to another. In reality, all sources of multiple quanta should, probably, be regarded as parallel multiple sources (think of heat and the vibration and wobbling of the universe across the antiverse sides of the matter capacitor that shakes photons out of their matter dance). So, the important point to think of here is what is it that constitutes one photon-pkt - no more and no less. Now, we know that e = hf (energy equals Planck's constant times frequency) and this creates a single (minimum) photon-pkt. What may be missing here is that the energy (concentrated improbability) of one complete cycle may be the same for every quantal photon-pkt (this could have implications for the standard single electron charge - it is the same charge under all circumstances (ie, every electron has a standard charge and every quark a plus or minus 1/3 or 2/3 charge). That is, one photon-pkt = h x f x amplitude. So, if the the frequency from big bang to black hole is somewhere in the region of 13.8 bn years (this cycle has a frequency of around $10^{-18}$ Hertz ($2.41 \times 10^{-18}$). So here, one photon-pkt = h x $10^{-18}$ x $10^{+18}$ (as distance, at the SoL, is swappable with time). For a gamma ray, one photon-pkt = h x $10^{+18}$ (Hz) x $10^{-18}$ (light seconds - or $3.3 \times 10^{-9}$ metres) (the latter term being the widest that the spatial expansion extends before collapsing back to "crossover" and apparent zero size). THIS IS PRELIMINARY AND NOT FULLY THOUGHT THROUGH - but it is a start and, I suspect, may be a fruitful avenue. Time, then, becomes the ratio of "rail-track pumps" to universe size. The 13.8 bn years size is ballpark - it assumes the time well from maximum compaction to remotest deep intergalactic space is this distance.

- "Nothing can travel faster than the speed of light." Perhaps this should be reworded as, "Matter capacitors cannot travel, relative to each other, faster than the speed of light."
- Have I said this before? Time is generally regarded as one extra dimension. However, if the foregoing arguments are founded then distance is compacted into time through three "antiverse" dimensions. Since they are all perceived - by us - to be intra-nuclear, they all are merged into one tiny space. However time should also be three dimensional and should compact independantly (as rotational disc like systems, like galaxies or solar systems, attest).
- Now: could this be a reasonable scenario? When photons are absorbed and subsequently emitted from atomic shells, might it be that an electron incorporates a third photon to create a temporary muon (even tau etc). By my reckoning, as it is balanced across the mean (muon/antimuon pair across the universe/antiverse divide), the orbit should suddenly expand to compensate for the extra energy/improbability/mass. Photons are absorbed as an electron converts to a transient muon and back to an electron as the photon is released. Probably a rubbish idea but, perhaps, worth pursuit.
- The "big bang" "happened" 13.7 bn years ago. The evidence of this is that we can see examples of galaxies from which light "started" to travel towards our arm of our galaxy within several hundred million years of the "big bang" event. However, this puts these galaxies in a "special place" which are then all lying at a 13.7 bn year periphery as measured from a central point in the spiral arm of our galaxy. Now, this is incompatible with the idea that nowhere in our universe is special. Wherever we take our stance, the same "picture" would emerge wherever we established our fulcral point of perspective. Now, looking at the system as deep (towards the event horizon of black holes) time wells, we can reinterpret things as the event horizon is 13.7 bn years (or more) "behind" us. Throughout the universe this would be a "constant". The amount of space that a photonic energy packet can be transferred across may well be the same from us to the centre of our galactic black hole as it is from us, looking out into the furtherest reaches of deep intergalactic space. It is just that in deep intergalactic space "spacetime" is overwhelmingly space, not time, and at the margins of the galactic black hole, "spacetime" is overwhelmingly time, not space. Viewed across a black_hole/big_bang junction, the two perceptions reverse instantly: dominantly space becomes dominantly time and vice versa. Indeed, I have already suggested that the black hole and big bang "points" are - potentially - immediate neighbours, if not the same "place".
- No place in the universe is special. Every point could legitimately considered it centre or its periphery depending on which side of the mean (inner electron shell OR big_bang/black_hole transition) you observe it. Quantum foam should arise as a pair consisting of a large magnetic sphere (very big) and a tiny, point like electric charge (small) which swap perceptual interpretations across the mean. Electric charge appears to be point like and the magnetic sphere appears to swell far into the universe (potentially, "all the way"). So every electric charge lies near to the centre of its particular universe. Interactions of electromagnetic perturbations that give rise to matter capacitors can occur because each "step" from energetic (improbability point) to the next can be close enough for the underlying quantal uncertainty to allow an instant quantum jump. This allows a saltatory, step by small step, "construction" of matter capacitors, in a process that could be regarded as emergent or evolutionary. Time wells thus emerge as "improbability entities"; and the "big bang" appears to be born in an extremely low entropy state.
- Just a thought: time and distance are potent separators. So, if spacetime can be "expressed" dominantly as space or dominantly as time, charged "particles" may be exceedingly close in distance and far apart in time. But, time is just distance glanced across the mean. That makes the whole idea of matter capacitors more potent for me.
- Where I think this is going (1): matter capacitors (formed from photons) concentrate the energy of a photonic wave at a focal point. Photonic waves can "jump" their energy "content" from one point to another. It radiates as light from matter when released from "orbiting" electrons (positrons) and then focalises (decoheres) from a light wave packet to a matter capacitor having traversed a variable distance (mm and less to light years) between the two points. A large portion of the energy (made from the "splitting" of nothing into two out of phase photonic packets which add up to nothing - remember the dice faces) is widely distributed in space. Possibly only a small portion of it makes it into forming stable matter capacitors. The split "nothing" then radiates then reconvenes at a focal spot. The positive wave "moving backward in time" interacts with the negative wave "moving forward in time" to create, ultimately, stable atoms (persistent atoms - ie the nuclei are a long way into the antiverse side, and this long way looks to us like a long time). The universe is made of enormous numbers of split "nothings" that emanate and reconvene at varying time well depths. A useful "picture" is to see a photon interacting with your face as a converging then diverging wave (going both ways in time so the same thing on the antiverse side will look like a diverging then converging wave). It never dips deeper into the time well than this parochial point. At the centre of the sun, the time well is much greater.
- Where I think this is going (2): "time going backwards" (and forwards for that matter) is probably an illusion of the state of matter compaction (or compaction into matter). Feynman popularised the concept that positrons could be viewed as electrons travelling backwards in time. However, when we consider the idea of time wells, what we are noticing is that distance looks like time when seen as part of the antiverse side (the matter side dominated by external positronic shells). Of course, the perspective from the antiverse side is vice versa. The universe side sees the antiverse side as running slow or even reversed in time and the antiverse side sees the universe side in the same way. This is just like two spaceships travelling apart near the SoL. They each see each other's clocks as running

slow. Since I am envisioning that the nucleus is really an illusion, this backward in time perception may be illusory as it is part of a ***virtual*** projection into the past. Consider a photonic wave that starts from an electron shell sized origin, extends out to a "universe sized" maximum (where there is insufficient energy left to allow any decoherence) then moves in again to an electron shell sized destination (which is really the same place as the aforementioned origin) by which time it has completed a cycle. It is clear that we appreciate only the universe side in our parish (external electron shells that repel one another and release photons to radiate into deep intergalactic space; these photons have ever lengthening wavelengths as the distance from the origin increases). The antiverse side will be, equally, moving from high matter compaction to radiative photonic dispersion into increasingly deep intergalactic space to meet the same ultimate maximum radiative diameter where +ve and -ve electromagnetic waves can locally "annihilate" (add up to zero energy) but still "travel through each other back off to towards the origin but on the other side. These two locations should both be external to the electron shell but "moving" relative to one another in such a way as the actual antiverse side seems non-existent to us.

- "WORMHOLES": Now, the eventual implication of what has gone before is, perhaps, this. All photon oscillations around the zero mean (that go on to combine as stable matter capacitors, eg, electrons/positrons) act like "wormholes". Here the distance of the "tube" is fixed by the apparent time well. For a single atom, that time well (actually a distance) is very small. For matter entering the event horizon of a black hole, this "tube" connects times of very different epochs. Whilst the tube on the right indicates a "long" distance, it is seen - from the top side - as a time difference between the top funnel entrance/exit and the bottom funnel exit/entrance. So, the top funnel entrance/exit on the electron-outside universe may appear like a "black hole" from this side but the bottom funnel (positron-outside universe) exit/entrance may appear as a "big bang" when perceived from the top funnel side (electron-outside universe) with a time difference 13.8 bn l yrs (which, of course, is interpretable as either time or distance). And, of course, vice versa. Photons that constitute a matter capacitor will exhibit entanglement across the two sides (which can be "transported" to one side when they are situated transposed to one side of the mean (just as an electron/positron pair can exist on one side). The entanglement across these large "wormholes" appears to be "instant". Remember, the funnel opening represents two of three dimensions. The reality would be that the circles here represent spheres and, what is more, contracting/expanding spheres that "bounce" in and out, never smaller that the tube of the "wormhole". So, effectively, each "funnel" is really a 3D sphere where, at the smallest size, there is a tiny displacement of "the in over the out" radiation. At its largest, there is a massive summed displacement (multiple "atoms"). Though drawn here as a tube, it would be a reflection half way along the tube so that the two funnels lie more or less in the same space but with a tiny displacement of each individual (universe and antiverse side of the) "atom"; however they remain close enough together to stay entangled and to form a very efficient matter capacitor.

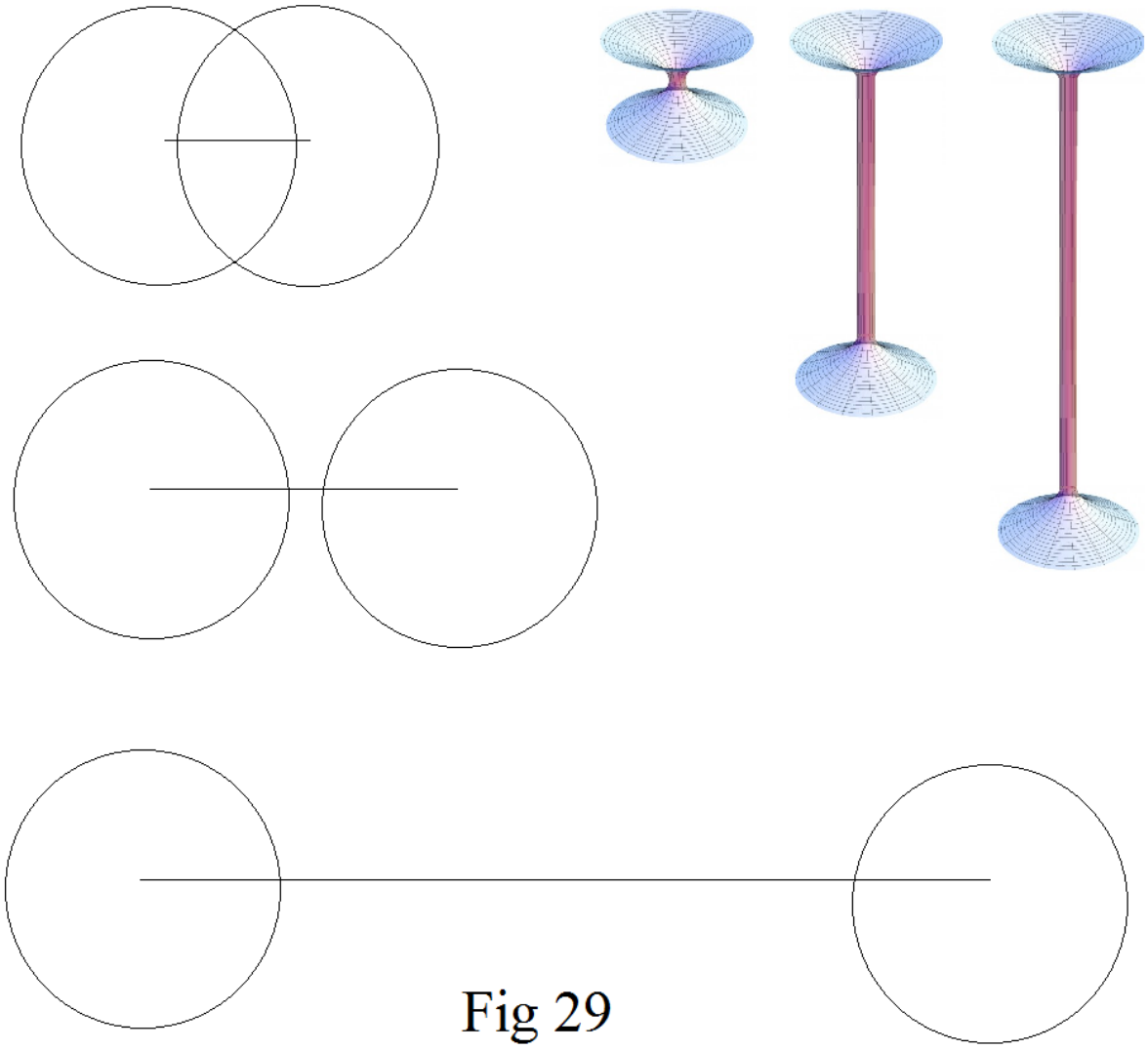


Fig 29

- **Why is inertial mass and gravitational mass different?** This is a question often raised. I wonder - if this idea of universe/antiverse proximity and inversion is right then it becomes clearer. The idea that electrons (also muons, taus and possibly etc) are formed from a "rectified" photon pair (triplet, quintupulet and etc) indicates that - at the reflective bounce - there is an immediate difference in "speed" between the incoming and outgoing elements of the photon pair. You could regard this as the universe and antiverse sides to be rushing through each other at relativistic speeds. So, we have an exact equivalence of inertial and gravitational mass.
- If we "tie together" Fig 15 and Fig 26 then we can see that anything "smaller than (approx) electron shell" could be a virtual projection of the antiverse side (for us) and vice versa from the antiverse (positron shell) side. Indeed, the only "real" wavefronts come from deep intergalactic voids focusing down to electron sized minima (and vice versa) that then reflect back (or simply pass through, inverting themselves in the process). Now that gives us a picture of a large "volume" of sparsely populated deep intergalactic space (vast voids). The dominant population here should be virtual particles flitting in and out of existence in vanishingly small space. Every now and then, chance will favour circumstances that create compactification (effectively, space is wrapped up into a tangle) that makes distance "behave" like time. I can imagine that electron positron pairs are the commonest and simplest "matter capacitor" that can form. These will self destruct (back to photons) within a short distance unless more stable matter capacitors have a chance to form. These will probably appear as such things as hydrogen atoms. Now we can imagine a progressive dive into deeper time wells (like H, He, Li) which start to build up a highly compacted set of capacitative improbabilities (energy). Now these, we know accrete gradually into stars, explode, generate heavier elements (like Fe, U) and, then go on to be compactified into neutron stars and eventually black holes. Now this is pointing the way to the big bang scenario of extremely concentrated, compacted and rediculously improbable matter capacitance (the extremely low entropy of the "big bang") before the point is reached where wavefuntions crossing the event horizon of black holes are condemned to emerge from an virtual point "explosion" on the

antiverse side (and vice versa of course). We notice this emergence as the ubiquitous quantum foam. Structural (informational) order occurs - not in the extreme uniformity (homogeneity) of the "big bang" explosion, but - in the fractal flow from this low entropy state towards the equally homogenous voids of deep intergalactic space. It occurs at its most intense, perhaps, on planets populated by technologically advanced civilisations. Somehow, we have to convert the "timed" elements into compactifications - that is difficult when we have this overriding experience of time flow from big bang to deep intergalactic voids.

- Is the universe a "perpetual" matter-capacitor generator? Perpetual motion machines are anathema in physics and rightly so in a our parish of the universe. From the preceding observations, it may be that the the Universe, seen from across the other side of the mean (really all those "now" points) appears as an "Antiverse" where all the atomic shells are populated by positrons and the nucleus by anti-protons. Really, they are just perspectives of the same thing but with the "bladder" being inverted - that is, what was apparently inside now becomes apparently outside and vice versa. On this scheme, the universe is in a constant universal background generation of quantum foam. This may simply arise from the fact that zero/nothing inverted is still nothing. Being nothing, there is no manifestation of it. However, some integer quantity (n) inverted has a value (-n). Nothing will never manifest itself whereas, using the analogy of those +3 to -3 dice I talked of earlier, a magnetic wave can occur as an exactly balanced pair of + and minus values that are exactly equal (cancel to nothing on recombination). From our universe side (electrons outside), there is a rectification across the mean (probably due to the relativistic speed of crossover - the focus in/bounce out "reflection") and thus the only way back to annihilation (true annihilation) is to return to the mean the long way round and that means - for matter capacitors - unwinding into photons first. The energy barrier to the true annihilation of matter capacitors is set far too high for it to occur easily across the electron shell "dialectric". It has to unravel back around the long way. Now, out in deep intergalactic space, where there is hardly any matter at all, the constant generation of transient particles is a dominant proportion of "what is there". Every now and then (in position - not time) and given the vast expanse of space, a time well will occur that is deep enough to persist (be a focal point). Every now and then, this again will reach the level of a time well of an atom of hydrogen. The steps from there are fairly clear and those time wells will occur as a balanced U-bend time well of uni- and anti-verse accretion of matter from electrons to H to Li to Fe to U to neutron star to event horizon to anti-U, anti-Fe, anti-Li, anti-H and positrons. Each of the particles making up these atoms lie very close to their balancing anti-particles (and thus atoms) but the energy barrier that would allow them to disintegrate directly back to photons (without first unwinding) must be very high (think about fusing hydrogen). The unwinding involves "opening out" of the entangled, dancing photons to the void. So there is a constant time well escalator (generator) downwards, leading to increasingly complex (wound up/compacted) photon dances. And there is a constant decay and release back to photons during this descent such that only a tiny (almost infinitesimal) proportion of these emergent/evolving matter wells reach the lowest levels. Those that do probably do so in a "slingshot fashion". In all this, time can be regarded as synonymous with distance (photon) compaction. I ***suspect*** that there are magnetic spheres with expanding/contracting fronts that exceed the SoL but since they do not dock with atoms (become incorporated into stable oscillating pairs/triplets/quintipulets etc across the mean), they do not become manifest to our observations (that rely on "docking"). For these largest magnetic spheres, they can effectively be across the universe in an instant. That is what I suspect. As these spheres reach a maximal potential (vs kinetic) energy, they may have slowed enough to start docking into electrons - displacing resident dancing photons and thus becoming measurable. Note, the apparent time within the nucleus of an atom manifests as a slowing - even, "deep down", a reversal - that is in reality the virtual projection of the antiverse side being everted out to the same deep intergalactic void and more or less complete photon unwinding. The antiverse side and the universe side both "move" from a deep time well (simply compaction) to timelessness (total magnetic sphere unwinding and annihilation by its "opposing dice face" partner).
- Note that this has all moved into intense conjecture/speculation. So how could it be falsified? Well, if the prediction that you can make a photon, muon and tau electron out of 2, 3 and 5 converging photonic magnetic spheres (respectively) is correct, the rest of the assumptions become increasingly likely to have nuggets of substance.
- Just to resurrect a point ...../// In the transition from "outside in" to "inside out" (and vice versa: in actuality the reflection from the - approx - electron shell minimal dimension) what is exceeding big suddenly appears to be exceedingly small and vice versa. What was outside the inner electron shell suddenly appears to be deep in the atomic nucleus, even within quarks. There is, in effect, an apparent superluminal inflation and reciprocal deflation. However, this gap is virtual, not real. It is, like Quad ELS speakers, an apparent property invoked by a virtual point source. The "future" infrared dispersion into a 1-D, unwound, photonic universe. In fact, this is a maximally expanded magnetic monopole (when all the kinetic contraction of its energy is converted to a static potential energy) that appears - through the nucleus - as the past but also appears - outside the inner electron shell - as the future. They are conjoined at the point of maximal potential energy and, in reality, a property of an uncompacted state of the universe's photons whereas matter and black holes (and big bang "singularities) are part of the evolved condensation into matter capacitors. I like this idea. It is still hard to realise how positronic electron shells suddenly appear to be like quarks. This needs exploration.
- That famous expression of the energy equivalence of mass ($e=mc^2$) could be reinterpreted as two lots of $^1/_2mc^2$ (the

kinetic energy of motion) ; that is, two "particles" of light in a phased dance across the mean. I need to think this through - would a three phase muon contain $1.5mc^2$ and a five phase tau $2.5mc^2$? Or would the doubling simply represent the two sides of the universe / antiverse. Or is there deeper meaning here, with three "sides" to a muon universe and five sides to a tau universe? I need to go back and see how $e=mc^2$ was originally derived.

- Some preliminary thoughts:- There is now talk of all electron-positron (e-p) pairs being "linked" by a wormhole. Let's think about that for a moment. A solitary e-p pair probably has a short "wormhole". Essentially, in the "tube" that joins the two, there is a time shift. Now, we are already suspecting that for photons interacting with atoms and creating e-p pairs, the photon enters and leaves "matter" (the matter capacitor) at the SoL. So time may just be the distance from the universe entrance/exit mouth to the antiverse entrance/exit mouth. Now, this views the process as two mouths separated by a distance. However, to create a highly effective capacitance, the positive and negative charge have to be extremely close; the only place that this happens is extremely close to the "now" point. Positive and negative charge may be as simple as this: on the universe side, negative charge may be the manifestation of a collapsing magnetic field (it "wants" to close out the space it envelops) and positive charge the manifestation of an expanding magnetic field. The antiverse view will be identical but its negative charge is our positive and vice versa. The view is identical - it is just the "bladder" that is inverted. The outer magnetic "monopole" (very large) is static with regard to us and the inner $e^-$ or $e^+$ (electron or positron) is the rectified "sawtooth" of the photon pair as they "race" towards the minimum size before blowing up again on the other side (universe/antiverse sides). Now, let's think about the isolated e-p pair again; they have a virtual singularity that is close to the "now" point. Once we have a hydrogen atom, that virtual singularity moves out to the inner electron shell. The virtual singularity for electrons in the outer shell of an iron atom is much further out. For the heavy unstable elements, it is further out again. I have already suggested that, in a different parish of the universe (high gravitational systems), even heavier elements may remain stable. As elements become heavier, so the ratio of neutrons to protons increases. So the free electron space (that interacts with the "outside world") gets further and further away from the virtual singularity. The actual e-p pair that feeds the electron "sawtooth" - two rectified sine waves) is, in reality very close but gives the illusion of being a long time apart (down to the virtual singularity and back). In neutron stars this becomes extreme and at the event horizon of a black hole, the distance from universe electron to singularity back to antiverse electron (positron from our perspective) now approaches the big bang to black hole distance. But, once again, it is a virtual distance. The two entangled pairs of photons are close to a common "now" point but kept separate (a virtual long way apart) by the conditions of the local parish. This needs tinkering bt I like the general trend and the way it brings together a lot of earlier points (eg, time at the event horizon running very slow so big bang and black holes much, much closer together than 13.7 bn ly; the strange ideas of entanglement - they may seems far apart but their "wormholes" are, really, the virtual separation from their local virtual singularity; Einstein's reciprocal slowing and shortening when separating at the SoL). This "wormhole tunnel" is, in effect, the dielectric that keeps the positive charges away from the negative. It might, in fact, be something so simple as contra-rotating entities. Rather like a modern vortex vacuum cleaner, there is a force that keeps them from "contaminating" one another even though they are Planck distances apart (both virtually at the "now" point. There is a distance apart amplification virtual energy separation (translated into "the long way around" distance) such that the direct combining of charges (leading to a collapse of spatial oscillation) cannot occur except by going the long way around - from "big bang" to "black hole". The antiverse's view is the same but our black hole is their big bang and vice versa. This accords with the Hawking's concept of e-p pair splitting across an event horizon and evaporation of black holes.
- An aside: Positive charge vs negative charge is probably the outcome of (from our point of view) of "expanding" or "contracting" space (parenthetic because we have - eventually - to lose the idea of time to just a position, the "cartesian co-ordinates" of space. The latter look different to for the universe side and the antiverse side. This is largely the result of a relativistic separation of the the universe's "outside" (the electron shell and negative outside charge where the magnetic "monopole" drives universe-side-space apart. Putting more negative charge outside the electron shell drives the magnetic - "monopole" - perimeter further out) from the antiverse's "outised". Remember that the two are inverted views of one another. What is "outside" swaps (inverts - in bladder fashion) as you cross the "now membrane". It is the counter-current of magnetic "charge" that effectively results in the rectification of spatial oscillations (which add up to precisely nothing - no spatial extent) across the mean. Anytime a particle pair is formed they are entangled across potentially vast distances and they form a "wormhole" that runs between the universe side and the antiverse side. The contracting wavefronts of two photons (for an electron/positron) "hit" the reflection (or inversion on passing "through" the minimal radius point - effectively a "pole" point) then expands out as an opposite charge. This leads to a web of interconneting wormoles, from single particle pairs (really just two dancing photos that oscillate back and forward across the now-membrane and appear on one side as an electron and the other a positron). Now we can imagine a large magnetic sphere building up as the "charge" exhudes through the balanced matter capacitor point (whatever creates the enormous dielectric effect that keeps the charge from - truly - annihilating) in a balanced in and out figure of eight fashion. It is this rectification that imposes the apparent SoL speed limit and separates the two sides (universe and antiverse) to create space. This is a bit vague at the moment but I love the idea of negatively charged and enormous (collective) magnetic monopoles ballooning out into the universe and positively charged (from our perspective) magnetic monoploes ballooning out into the antiverse. The

ballooning out runs countercurrent to the electron shell sized wormhole filament that carries the positive charge through the now membrane. Reemeber, negative charge is expanding (from the universes perspective) and contracting from the antiverse's perspective and this swaps polarity as "we" cross the now membrane.

Start new point.....

Hmmmm. Perhaps "God" ***does*** play dice. Or should we say "God ***is*** dice" ?

### Articles of interest:

Note: I am not sure whether I have previously brought attention to Lawrence Krauss's "A universe from nothing". If not, this is an omission to be rectified as he has written much on this subject.

This paper, "One antimatter - two possible thermodynamics" by Klimenko and Maas [doi:10.3390/e16031191] discusses entropy, time and time reversibility. The maths is a bit like Egyptian hieroglyphics to me but it seems to be rumbling around in an area that intrigues me.

I have found Donald L Hotson's take on Dirac a very useful resource There are parts 1, 2 and 3. Here is part one.