



TOE:THE DUAL CONTINUUM

Introducing the symmetric, deterministic and orthogonal Energy-Mass continuum beyond the Planck length, classically explaining all 'quantum' behaviour, gravity and the Bosonic atom model

ALBERT EINSTEIN ON QUANTUM MECHANICS:

'....Begriffe, welche sich bei der Ordnung der Dinge als nützlich erwiesen haben, erlangen über uns leicht eine solche Autorität, dass wir ihres irdischen Ursprungs vergessen und sie als unabänderliche Gegebenheiten hinnehmen. Der Weg des wissenschaftlichen Fortschritts wird durch solche Irrtümer oft für längere Zeit ungangbar gemacht...'

'....Concepts that have proven useful in ordering things easily achieve such authority over us that we forget their earthly origins and accept them as unalterable givens. The path of scientific progress is often made impassable for a long time by such errors.'

ABSTRACT & SUMMARY

Quantum Physics (QP) has proven tremendously successful in describing the behaviour of subatomic particles, yet it cannot fundamentally explain particle-wave duality and other related paradoxes. As a consequence, starting with Einstein, there has always been the suspicion that QP is merely a mathematical approximation of a deeper underlying physical reality. Now, nearly a century later, many theories have been added, yet the old paradoxes remain. This suggests something fundamental we implicitly take for granted may yet be false....

Remarkably, it would appear the solution lies not within QP but at the very heart of classical physics; Used to only think in terms of 'the big', we humans have always assumed there is a *fixed* relation between the four 'functions' of our continuum -*Grid, Clock, Potential, Inertia*- and the four SI base units or 'dimensions' of *Space, Time, Energy, Mass*.

In this paper we will *prove* this relation is actually a **binary** or **dual** one: When crossing the Planck length, the function of 'Grid' is no longer defined by 'Space' but by 'Energy', while also 'Time' and 'Mass' switch orthogonally in their function of 'Clock' and 'Inertia'. This switch includes an orthogonal $\frac{1}{2}\pi$ polar Planck energy 'distanced' spiralled wrapping of physical grid field lines which run unabridged through both continuums as closed strings.

Crucially, both orthogonal dimensional setups always apply for all particles of both continuums, their influence getting equally strong near the border of the Planck scale. This results in the observed 'quantum effects' which can now all be classically explained. As such, Quantum Physics may be a great mathematical approximation, fundamentally it is a flawed mono-continuum human perception of a world that is inherently governed by the symmetric dual continuum set-up.

The implications of the dual setup are far-reaching: It provides $2 \times 4 = 8$ base dimensions and 3 encapsulated 'brane' singularity levels, consistent with 11 dimensional string theory. In addition, when applying the dual setup at the atomic level, an improved 'Bosonic' atom model emerges, shattering our classic view of especially the electron. Finally, the physical and *very tangible* fundamentals behind mass and gravity on all scales are now exposed, as are the solutions to dark energy and dark matter on the cosmic scale.

Summarised, the dual continuum literally adds the missing 50% of our classical physics, offering the solid foundation for physics on all scales, solving the QP paradoxes that have blocked progress in fundamental physics for nearly a century...

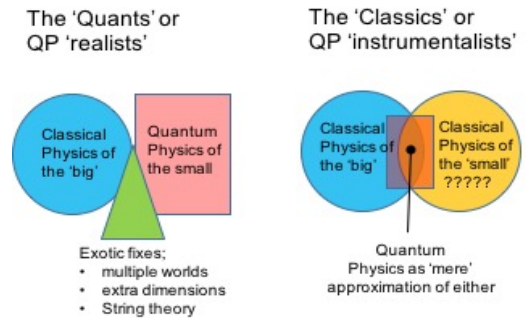
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1. Introduction to the dual continuum

1.1 QM realists and QM instrumentalists

There is no question quantum mechanics (QM) or quantum physics (QP), though counterintuitive and 'ugly', is highly effective at describing the behaviour of subatomic particles. However, 'description' does not equal 'explanation' and starting with Einstein there has always been the lingering feeling that QM is a mere mathematical approximation of an underlying deterministic and symmetric physical reality ruling the world of the very small. The group of scientists that calls for QM as a physical reality are referred to as 'realists' while the group that suggests a deeper underlying deterministic reality would be the 'instrumentalists'.



Einstein, throughout his entire life objected to the notion of QM being of fundamental value and famously attacked QM via his EPR paradox predicting non local entanglement, which was deemed impossible. The answer came in the early 70's when Bell's theorem laboratory tests confirmed quantum entanglement *is* real. This victory of QM did not rule out it could yet be a mere approximation of reality, yet from then on consensus was that QM was the fundamental theory for the 'world of the small' soon to solve all paradoxes. Decades past and...nothing happened. Progress was made developing the standard model of particle physics, but no progress was made solving the old paradoxes like: Loschmidt's paradox, particle duality, entanglement, the dead cat paradox, the double slit experiment, unification of gravity, dark energy and matter/anti-matter asymmetry. The realists generated a plethora of complex theories at times bordering science fiction, yet fundamentally it brought us nowhere. Their problem it would seem, is not a lack of complex answers, but the lack of a fundamental question. No question...no answer. There is the central question of duality underlying all paradoxes, but QM realists already dealt with it by applying the mathematics of probability. This leaves only the QM instrumentalists to *physically* solve the century old question:

'...How can something be a particle and a wave at the same time..?'

The instrumentalists so far failed to find the answer to this dilemma as their approach lacked the two aspects needed to solve it: First of all, for it to be a fundamental problem, duality must have a simple answer. Our thinking is way too complex. Secondly, the answer to the question is not in the first part of the question, it is in the second part! Strictly applying the logic of symmetric determinism, gradually leads to the correct answer:

1.2 The case for the dual continuum

1. We tend to think of paradoxes as inherent complexities of nature which we may solve at a time of our liking. However, nature has no paradoxes. Paradoxes are the product of incorrect and/or incomplete human thinking.
2. Consequently, since classical physics and QM combined create numerous and persistent paradoxes, we must conclude that a substantial part of classical physics and/or QM is incorrect and/or incomplete.
3. Secondly: Either for 100 years we are addressing this problem correctly but nature is too complex for us to grasp, or we are *not* addressing the problem correctly enforcing corrections in the wrong areas. We will assume the latter
4. Faced with unexpected quantum effects, our reflex until now has always been to assume that QM must be incomplete, introducing new fixes like 'hidden variables'. But why? QM may be ugly, incomprehensible or even non-real, but all tests confirm that it is working perfectly, whereas **classical physics** is not. Logic then dictates it must be **classical physics** that is incorrect or incomplete.
5. Since classical physics *does* correctly describe the 'macro' Spacetime (ST) continuum, we must assume classical physics needs *augmentation* and not *alteration* to explain quantum effects on particles at the smallest scales.
6. Symmetry next demands that *if* we add anything next to the ST continuum, it has to be *entirely symmetric* to the ST continuum itself. Hence the answer would lie in a dual continuum governing the 'very small', with formalisation similar to our ST continuum. **This places QM symmetrically in the middle** as approximation of either continuum!
-With this targeted design step we aim to restore full symmetry in physics, which was lost upon the introduction of QP-
7. Because classical physics already correctly describes the ST continuum, any overlapping dual classic continuum must be non-influential or '**orthogonal**' to the physics of the ST continuum structure itself.
8. The dual continuum *does* however need to be able to influence the *particles* of the ST continuum (and v.v.) since dual classical influence on particles is the reason we are suggesting its existence in the first place.
9. The dual continuum influence on particles must explain *all* QM effects, otherwise we will declare the idea flawed.

1.3 Designing the dual continuum

The instrumentalists must now solve the puzzle of *what kind* of orthogonal set up could be the basis for a symmetric continuum intertwined with our ST continuum. One might be inclined to think the physics and mathematics behind any such orthogonal solution must surely be complex. However, suggesting or 'craving for' complexity is a strange human lapse of reason since anything 'fundamental' by definition can not be more complex than the subsystems that are derived from it. Thus, we are far more likely to find the answer in 'supreme' simplicity, preferably even *binary* simplicity. As such we will try enforcing a binary solution before stooping to more complexity.

Any binary solution can only be all-embracing if it were located as an extra degree of freedom at the conceptual apex of our continuum. Currently this apex is formed by the nominal scale of our four base units ('dimensions' in this paper): Space, Time, Energy and Mass. The only potential higher conceptual level would be the four **functions** of a continuum: Grid, Clock, Potential and Inertia. Until now, we humans –used to only think in terms of 'the big'- have always **assumed** the relation between these 4 functions and 4 dimensions was 'fixed' or 'synonymous'.

However, **if** Nature indeed favours fundamental binary simplicity, then this relation **must** instead be relative and binary. This means that in the world of the very small –the Planck length- the function of 'Grid' is no longer defined by the dimension 'Space' but by the dimension 'Energy'. Consequently, also Time and Mass would switch in their functions of Clock and Inertia. Although one setup dominates, the other is always orthogonally present. In table form:

	1_Grid or 'Locator'	2_Clock or 'flow'	3_Potential to move	4_Resistance to move; 'inertia'
ST continuum (Energy singularity)	Space	Time	Energy	Mass
ME continuum (Spatial singularity)	Energy	Mass	Space	Time

1.4 General implications of the dual continuum

At first glance this binary setup appears overly simple. However, the explanatory potential of this dual concept is mind-boggling: It offers a classical explanation for all QM effects by introducing the concept of a dual and **orthogonal** '**mass clock**'. Next, it also provides a concept for physics inside spatial singularities completing classical physics:

1. *Quantum mechanics.* The conceptual introduction of the dual 'mass clock' allows us to classically explain QM effects: In our ST grid the clock of 'time' dominates. The Mass Energy (ME) continuum clock of 'mass' also ticks (backward even), but it is orthogonally aligned to the flow of our 'time'. Effectively this means that when we observe a particle, we cannot distinguish *movement* of this particle in the dual ME continuum: From our perspective all possible energy-mass positions come '*time instantly*' at the same 'tick' of our clock. The QM wave distribution ψ would simply represent the underlying classical movement functions in Energy-Mass terms 'sped up to infinity' in our terms. Continuing, also *Heisenberg's uncertainty principle* becomes classical: It is the distancing operator between the two grid locators of Energy and Space. These are always separated by an orthogonal $1/2 \pi$ polar notation based grid spiral- explained later-. It also suggests we can not detect the ST spatial position of a particle by measuring its *Energy* since Energy is the locator of our *dual* continuum. By measuring its Energy, we effectively and classically change its locator into the detector related position in our ST continuum. With this, one can now also classically explain entanglement, double slit, dead cat etc.
2. *Classical physics;* The dual grid setup offers a classical concept to physically 'wrap up' an entire ('dark') energy universe inside a spatial singularity, simply by replacing the grid unit of Planck Length with the orthogonal spiralled grid unit of Energy. Next, the symmetric consequence of having both a winding (mass) and unwinding (time) clock is that the inversed situation must then also happen, meaning singularities would typically and perpetually *alternate* between their max spatial and max energy state under constant total dual entropy. The reversals must then entail a reversal of the arrow of time and thus –seemingly!- of gravity. By logical extension, this means that an encapsulated singularity (e.g. a galaxy) may experience an opposite arrow of time relative to the bigger and slower oscillating singularity (our 'big bang' universe), observing an ever faster expanding universe with seemingly 'repelling gravity', whereas in fact it is contracting, abolishing the need for dark energy. Finally, due to symmetry, at the other side of the big bang singularity there would need to be an equivalent entangled anti-matter ST universal lobe 'expanding and shrinking' just like ours. One day both lobes would merge again to form the next 'big bang'. Chapter 4 will explain such fascinating logical consequences in detail.
3. *String theory;* The dual continuum setup appears consistent with string theory as well. Using the table above, we get to 8 base dimensions (3 spatial, time, 3 energy, mass) and 3 relevant nested singularity levels: universe, galaxy, atoms (?), totalling 11 dimensions. In addition, actual academic singularity simulations presented in this paper suggest field lines would be closed strings stretching and oscillating in both continuums.

4. *Einstein's Energy-Mass equivalence formula $E = MC^2$* . From the very first days of its discovery by Einstein, this iconic and mathematically correct equation, was thought to represent the fundamental 'interchangeable' relation between mass and energy. Indeed, in extremis -during fusion- mass *does* seem to convert into pure energy. However, this relation is an *indirect* one: Looking at the dual dimensional table, Mass actually relates to Time, while at the same time (and hence the confusion!) it is the *Space* that Mass occupies that relates to Energy, not unlike Archimedes' Principle. As an example:

In our Sun, the fusion of 4 hydrogen atoms results in a helium-4 atom which has an 'extrinsic' volume slightly *bigger* than four individual hydrogen atoms. As such, it now occupies more spacetime, meaning a *loss* of spacetime from the perspective of the ST observer. To compensate, according to the table, the energy grid inside the fusion product has to physically expand into the ST continuum, its bend energy fieldlines only just piercing the ST continuum at the Sun's photosphere, defining it as such. More powerful eV fieldlines head further out into our ST continuum where they cannot exist other than by disintegrating as high kinetic charged particles ('solar wind') at the Sun's corona, solving the 'corona heating problem'.



In contrast, at a later stage of a star's life, the fusion of heavy atoms beyond Fe^{56} actually cause a *decrease* of extrinsic volume of the fusion product and thus an *increase* of spacetime, which according to the table must result in absorption of an equal amount of energy. Our ST fieldlines now pierce into the photosphere outside-in. The external ST effect would be that the star literally becomes dark while cooling its spacetime environment and *increasing* its grid related mass. As explained later, one would typically find such dark older objects at the *outer* spiral arms of galaxies.

As such, our mono continuum interpretation of $E = MC^2$ has ironically barred us from grasping that our 'spacetime' grid has a dual and orthogonal 'energymass' (short: 'EM' or 'ME') manifestation. Only with this insight one can fundamentally explain the interconnected relation behind gravity and electromagnetism. But first we will do a reality check of the dual continuum concept as we determine what $E = MC^2$ actually *does* fundamentally stand for:

1.5 Dimensional validation of the dual continuum: Fusion of hydrogen nuclei

When smashing mass/energy objects like hydrogen nuclei onto each other, they fuse. Physically this means that their separating distance just before merging becomes so small -smaller than the Plank Length- that for the last 'piece of the road' the movement laws of the dual ME continuum must emerge. Yet, we also know that Einstein's mass-energy equivalence formula emerges as energy is released via $E = MC^2$. This implies that in order for the concept of the dual continuum to be congruent with classical physics, $E = MC^2$ should represent *movement* in dual terms. Let's check this:

SPACE-TIME Continuum			→	ENERGY-MASS continuum		
		Dimensions				Dimensions
Location:	Distance	Metres (m)		Location:	Energy	J(eV) or Nm
Inertia:	Mass	Kilogram (kg)		Inertia:	Time	Seconds (s)
Clock:	Time	(s)		Clock:	Mass	(kg)
Speed:	Distance/time	m/s		Speed:	Energy/Mass	Nm/kg = $\frac{kg \cdot \frac{m}{s^2} \cdot m}{kg} = \frac{m^2}{s^2} = \text{'Specific Energy'}$

Substituting EM dimensions in the ST movement equation we get the EM expressed movement equation:

ST Movement:	→	EM Movement
Distance = time*distance/time = $t \cdot v$ [m/s]	→	Energy = Mass * Energy/mass = Mass * $\left[\frac{m^2}{s^2}\right] = Mv^2$
Or: Distance = $t \cdot C$ (in case of light speed)		Or $E = MC^2$ (in case of light speed)

Indeed, Einstein's ST Mass Energy equivalence formula *does* equal 'movement' in dual physical terms. The dual continuum concept thus offers an easy derivation of $E = MC^2$ and gives a fundamental explanation why something that holds energy automatically also holds a small amount of extra (relativistic) mass in ST terms: By means of functional balance, all objects simply also move in the $\frac{1}{2} \pi$ orthogonal spiralled dual continuum over a distance 'E' involving an instant 'time spent' of 'M', which is felt as an instant extra 'relativistic' mass term in our continuum. Of course, from the viewpoint of the ME continuum, there is no way either E nor C^2 in their *spatial* terms can be linked to grid movement of $E = MC^2$, which is why Energy (E) has its alternative grid notation of [J] or $[Q \cdot \Delta V_{olt}]$, and C^2 changes into an electrical constant in Coulomb's constant $k_e = c^2 \cdot (10^{-7} Hm^{-1})$. Extrapolating, most of our constants in physics are actually a mixture of both grid notations and we will soon demonstrate we need to dimensionally translate [kg] and [Joules] into ST terms [s] resp. [m], in order to see their true fundamental effects in ST. This leads to a whole range

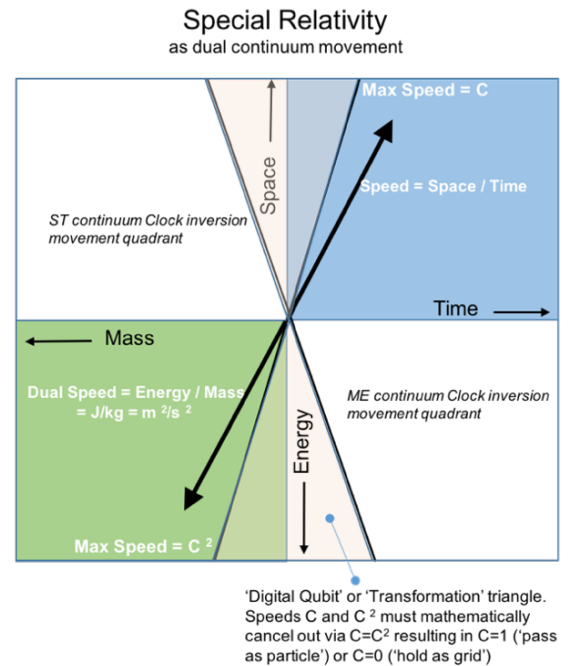
of simplified definitions for e.g. G and k_e , effectively rendering *both* the gravitational *and* the electromagnetic force dimensionless, while Planck's constant changes into a spatial flux constant [m^3/s].

1.6 The dual continuum and special relativity

Another interesting aspect is that the dual speed notation of C^2 is

the basis for the Lorentz transformation term $\gamma = \sqrt{1/(1 - \frac{v^2}{c^2})}$.

Moreover, since movement in the ME continuum is non-spatial, it constitutes an inertial frame of reference relative to spacetime. Combined, this suggests that the dual continuum is the fundamental physical phenomenon behind Einstein's special relativity, exposing the additional effects of the 'dual continuum' at various speeds. One can now complete the well-known, yet hitherto incomplete space-time diagram to the right, often used to explain special relativity: It illustrates how each movement inside the ST grid, is automatically balanced out in its opposite functions in the ME continuum quadrant: As such it is not correct to say an object travels 'through time' as a 4th grid dimension. Rather it moves 'through Energy' while mass and time also cancel out. This symmetric relation to the right, maintains the (zero) entropy equilibrium of all functions, with the Lorentz factor γ operating as the fine-tuning factor adjusting for all speeds between 0 and C .



In mathematical terms, movement thus is a complex vector where the imaginary component is its squared negative equal, resulting in zero net movement: $z = a + bi = 0$. As such, the virtual (dual) spatial effect of linear movement in our ST continuum takes on the form of $-[m^2/s^2]$ which, if taken literally, means a virtual inward accelerating surface contraction effect of the grid orthogonal to the particle's movement. For the distant observer this means that an object nearing the speed of light will appear ever more contracted, which is a known phenomenon in special relativity. This motion induced effect comes close to describing 'gravity'.

Yet since also macro objects at rest in ST display the property of gravity, we get a first hint that gravity is primarily the result of movement inside the *ME quadrant*, namely the 'time instant' spiralling movement of subatomic particles in and around the nucleus of the object's atoms. It leads to an orthogonal *linear* or 'longitudinal' ST contraction effect in the area around the atom, constituting what we call gravity. *It is only due to the fact that the various electron 'orbits' of the numerous atoms inside an object are utterly unaligned,* that gravity yet *appears* to work radially and weak. But whether ME or ST based, the ST contraction effect always stems from the dual continuum off-setting effect of movement!

In extremis one would summarize the movement of all the objects' individual particles of spin 0, $\frac{1}{2}$, 1, 2:

The reversed must then also hold true; By generating an electric field, one enhances the energy density around particles (J/kg) in the ME continuum. Since this constitutes an increase in *linear* speed in the ME continuum, the particle must then display a virtual and opposite inward *spiralling* movement trajectory in the ST continuum. This predicted effect is of course well known and photographed in bubble chambers.

The equation is:
$$\Psi = \int e^{\frac{i}{\hbar} \int \left(\frac{R}{16\pi G} - \frac{1}{2}F^2 + \bar{\psi}_1 \not{D} \psi - \lambda H \bar{\psi} \psi + |DH|^2 - V(H) \right) d^4x} d^4x$$
The terms are labeled with arrows: $\frac{R}{16\pi G}$ (Ricci scalar), F^2 (Maxwell-Heyl), $\bar{\psi}_1 \not{D} \psi$ (Klein-Gordon-Maxwell), $\lambda H \bar{\psi} \psi$ (Higgs), and $|DH|^2 - V(H)$ (Lagrangian). Below the equation, the spins are listed: spin 2, spin 1, spin 1/2, and spin 0.

At a larger scale we can *locally* manipulate Earth's weak radial grid contraction by producing an orthogonal ME *gradient* in the movement of sub-atomic particles, e.g. by using magnets or by forcing an electric current to run through a wire. This artificially aligns the movement of (subatomic) particles, producing overlapping orthogonal ST contraction effects in the direct grid around it. Given the short distance and gradient overlap, these effects are far stronger than the collective contraction effect of Earth's unaligned atoms, allowing Earth's curvature of spacetime to be locally either 'un-curved' or 'extra curved'.

As such, the 'electromagnetic force' and the 'gravitational force' are really the same thing; they are instances of movement, leading to the sensation of curving and un-curving the dual grid structure (ST and ME grid always in orthogonal and opposite phase). Neither 'gravity' nor the 'electromagnetic force' are therefore true forces and we will shortly prove they are physically dimensionless. Moreover, we suspect the same applies inside the atom's nucleus at a smaller scale, in which case there would be no fundamental forces at all in nature, only the virtual and intertwined curvature of the dual spatial and energy grids, induced by oscillating singularities at the various, nested (!) scales.

Gauge bosons

Getting back to the dimensional table at page five, the dual continuum setup predicts the existence of particles made of time instead of mass. They cannot have mass and since their spin is effectively not time based, they cannot have an anti-particle in ST terms. These of course are what we call 'gauge bosons' although symmetry suggests there will be a lot more. As such there is even a prominent conceptual place for the 'graviton' literally 'discharging space' as we will see in chapter 2. However, we will first take a step back and produce observational underpinning of some of the concepts we mentioned in this paragraph.

1.7 Movement inside the ME continuum; the 'electron/photon' quantum leap

At this stage, one may once more take a look at the table formulation of movement inside both continuums

'...In our continuum it takes **TIME** for a **MASS/ENERGY** object to move from one **SPACE** location (or 'state') to another...'

'...In our dual continuum it takes **MASS** for a **TIME/SPACE** object to move from one **ENERGY** location (or 'state') to another...'

The formulation of movement in the ME continuum may seem strange but it is actually familiar: In atoms it does not take 'Time' but relativistic 'Mass' of an incoming photon to move an electron *instantly* to a higher ENERGY state.

The 'electron leap' thus appears to be a ME continuum movement process. There are two intriguing consequences:

- ME continuum movement between the electron orbit and the nucleus suggests there would be a **singularity-like situation present inside atoms** even though an atom is considered too light to be an actual micro singularity.*
- Since an electron does have mass, it is a ST continuum particle and therefor could not possibly make the time instant 'electron leap'. Only a ME continuum particle, in this case a photon, can do this.*

Combining both remarks above, and however awkward spin-wise, the concept of the dual continuum thus leads to the **falsifiable prediction** that **an electron is a ST continuum superposition of an ME continuum atom bound photon**.

If so, the dual geometric consequences are clear: It implies an atom bound electron is not a continuous 'orbiting' particle. Rather; orthogonal and *time instant* in-out moving photons would be visible only at the various energy (=distance) radii from the nucleus where they 'turn around' in ST during which time we call them 'electrons'. Thus, 'electron orbits' would merely be 'stroboscopic' collections of equal distanced (energized) discharges. Although seemingly exotic, there is a way to verify this dual continuum prediction; Since we are considering singularity-like behaviour in combination with photons (quantum leaps) one could look at actual simulations of singularities impacting electromagnetic field lines. This should logically represent the supposed intra-atom photon behaviour in 'wave' terms.

1.8 Fieldline wrapping and the electron

Two actual computer generated simulations are presented below, showing how a singularity bends vertical electromagnetic field lines into spiral arms as it intensifies from left to right. In the next chapter we will show that the dual continuum motion formula describes this orthogonal grid spiralling and we will therefor keep this figure as a good approximation of reality. Notice the impressive consistency with what was predicted in the previous paragraph!

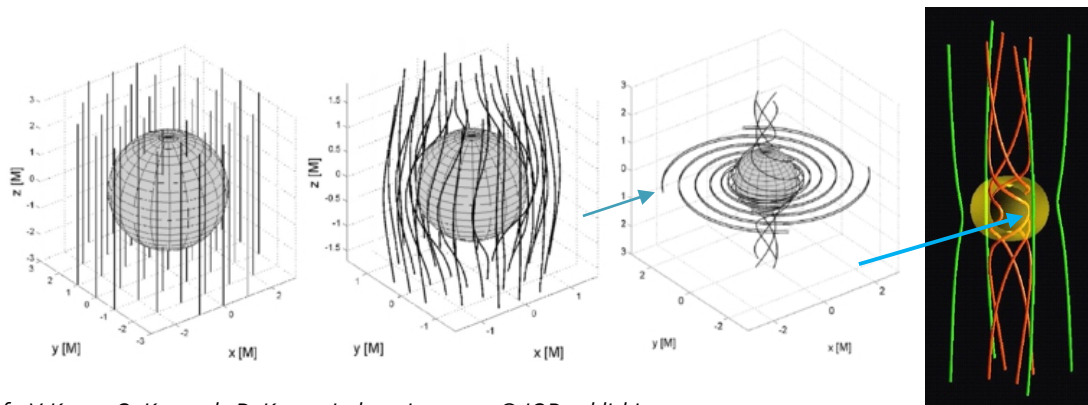


Figure 1.7 Left; V.Karas, O. Kopacek, D. Kunneriath, 17 jan 2012, © IOP publishing.

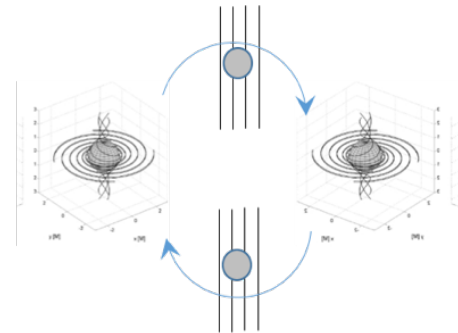
Right; PIA 04207 Japan's National Institute for Fusion science; Black hole twisting electromagnetic fieldlines. 1999

The most important aspect of the pictures above is highlighted by the blue arrow in the picture to the far right, showing how field lines first get **folded** into U-turns, which next get stretched into orthogonal **double** lines forming spiral arms. As such, field lines run uninterrupted and simultaneous in both continuums. Since symmetry suggests that the vertical field lines will then also be connected in a fold higher up, forming a similar 'u' turn, we should actually speak of closed big **strings** which at several positions are constantly getting folded, wrapped and straightened again by micro singularities constituting atoms.

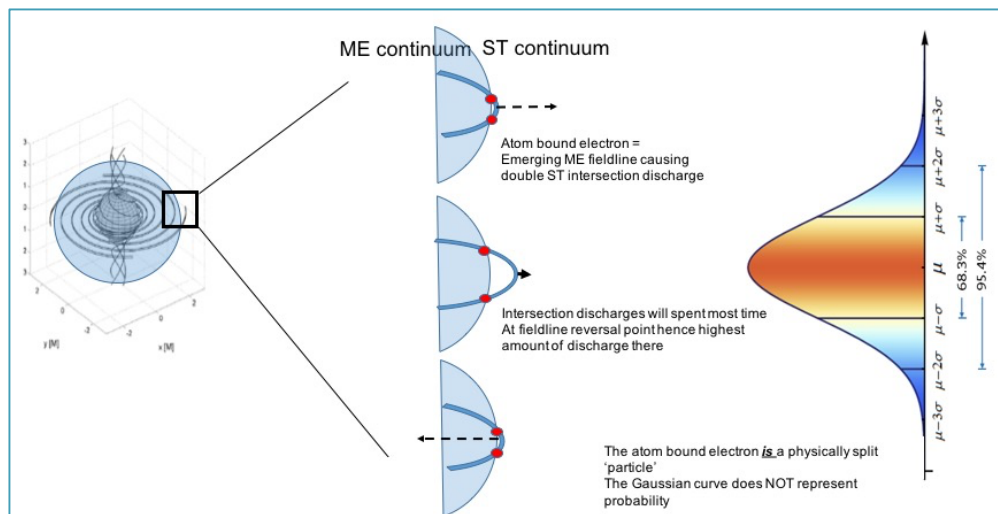
In order to conserve energy (momentum) such micro singularities would perpetually and harmonically oscillate between clockwise, straight and counter-clockwise. Note that the 'straight ST phase' will appear 'orthogonally spiralled' from the EM continuum perspective! This perpetual oscillation between max spatial and max energy state was already mentioned on page 5 as a direct consequence of the dual continuum concept. The dual concept thus entails two 'predictions' :

1. The electromagnetic fieldline oscillation to the right represents the built of an atom
2. The electron is a ST superposition of an atom bound photon.

Combining both, the electron would be the result of oscillating and bend electro-magnetic field lines, stretching into the ST continuum at the atom's border before heading back time instantly to the atom's other side. This would look as follows:

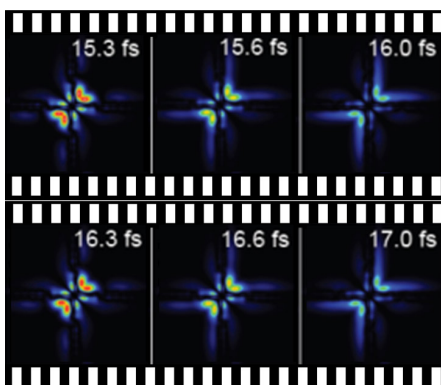


Perpetual oscillation, between mirrored spiraled states keeping electrical momentum



From the figure above, the dual continuum concept leads to the geometric prediction that each atom-bound electron actually consists of a double electric discharge, most intense at its furthest point. In 'particle terms' one would say a photon heads along the EM fieldline towards its spiral end, taking the U-turn where its spin changes from +1 to 0 back to +1, constituting an average of spin $\frac{1}{2}$ and with absolute spin change of -2 (!). In the next chapter we will see how this beautifully aligns with the concept of emitting of a graviton, marking a change in the arrow of time in the middle, making the electron symmetrically engage with its future self from our outer ST perspective! This in turn gives fundamental meaning to the fine structure constant.

Remarkably, the prediction of the atom bound electron being a split discharge was recently confirmed at the Max Planck institute! Below, a Helium atom showing a symmetric split discharge -simultaneously at each side-, as both field lines perpetually change their piercing position from one side of the atom (clockwise) to the other (anti-clockwise). The unwinding in between takes place in the ME continuum of the atom, which is *time instant* and therefor not noticeable. This is nothing short of the predicted and observed complete and utter overhaul of the Bohr-Rutherford model!



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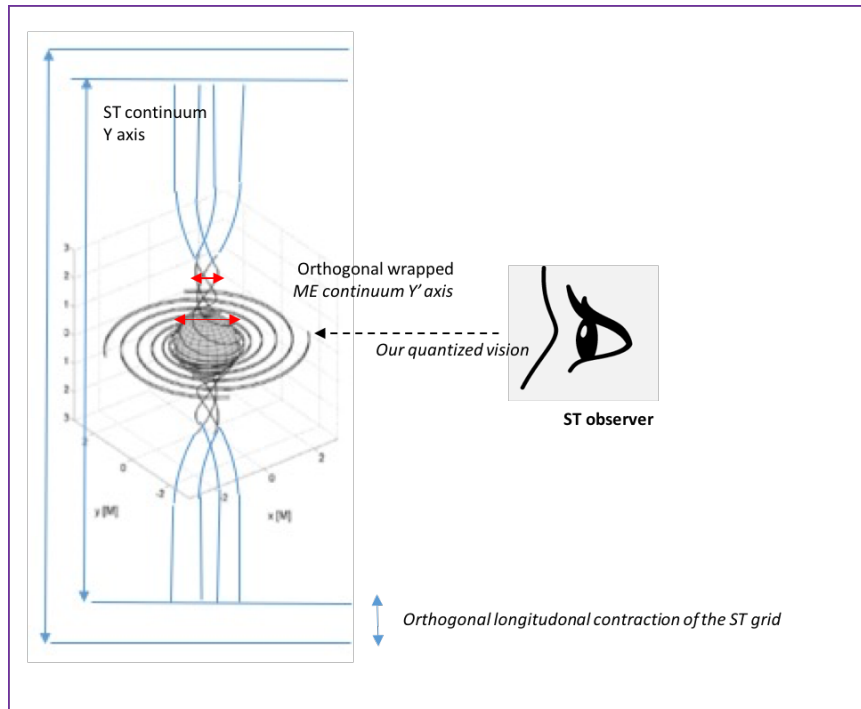
'...Electronic pas de deux: Physicists in Heidelberg have filmed the pulsing motion of the electron pair in a helium atom. At 15.3 femtoseconds (fs) the two electrons are close to the nucleus (center of image) and then move away from it. The colour indicates the probability of finding one electron at position....'

Notice that, lacking the knowledge of the dual continuum, the Max Planck Institute can't fundamentally explain the split.

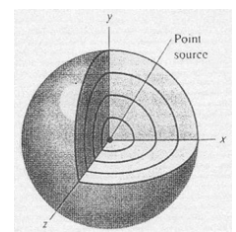
Also; in the above scheme, one may notice that the dual red intersection points constantly converge and diverge over a section of the outer 'photosphere' shell of the atom. Such behaviour is similar to observed 'cells' at the Sun's photosphere, suggesting a fractal nature of the dual continuum concept, further solidifying its candidacy as the ToE on all scales.

1.9 The quantized atom, quantized grid and gravity

From the previous paragraph, it is only a small step to next fundamentally visualize and understand quantized behaviour in classical terms:



Suppose we are able to observe a (Beryllium) atom travelling along 4 ST field lines in the Y- axis direction. While moving from top to bottom, it will constantly wrap an unwrap the 4 fieldlines. Close to the heart of the atom, the 4 field lines are increasingly distorted relative to each other, as indicated by the red arrows. Effectively this constitutes a Gaussian probability curve reflecting the uncertainty of the relative ST position of the vertical spacetime field lines, not so much the particle itself! At the centre this uncertainty is maximal as the ST position of the 4 grid lines are indistinguishably blurred in ST terms. In contrast, it coincides with an optimum *orthogonal* ME view for the ST observer, as the 4 field lines form a distinct constellation of equal 'distanced' energy windings, always a fixed manifold of Plank Energy distance. This perfect orthogonal grid view combined with the now irrelevant ST grid is the fundament behind Heisenberg's uncertainty principle. Moreover, we now fundamentally understand that *it is our 'heads-on' ST perspective of ME spiralled field lines that constitutes all 'Quantum' behaviour!* Moreover, we need to keep in mind all human senses are ENERGY receptive, not spatial! Of course, this instant orthogonal and quantized energy view also holds true for the wrapping of the x and z axes. Therefore, if we superimpose the additional wrapping of these x and z spatial axes at the same spot, we get an e-Energy distanced concentric 3D sphere (*right*) for our dual grid. Movement inside this ME grid is time instant forming the basis for 'non local' entanglement. However, if field changes are induced by objects (partly) propagating in the ST continuum than this generates a 'refresh rate' per ST point appearing limited to C.



As a spoiler alert; if we next assume the 4 vertical ST field lines (part of closed strings) above have a fixed total length, then both the clockwise and counter clock wise wrapped ME position will result in shorter vertical ST field lines (see above in blue) and as such 'pull' distant objects closer to the oscillating singularity. The in-between straightening phase is **time instant**, thus **not noticeable** for the ST observer nor distant objects. **This** is the very *tangible* fundament behind Einstein's spacetime curvature and thus gravity, as explained in more detail later.

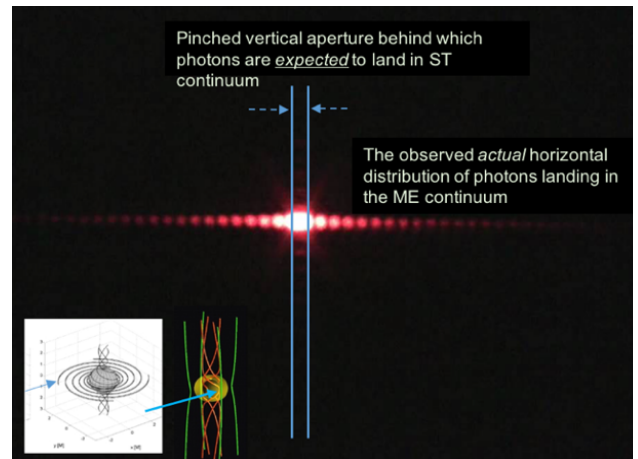
1.10 Fieldline coatings, quantum fluctuations and EM radiation.

To imagine how the dual grid would change from an ME into a ST dominated grid, we could think of extreme 'spaghettification' of mass/energy objects falling into a singularity. Passing the event horizon, they would go to orthogonal infinity, becoming (near?) infinite lines of energy/mass inside the ME continuum, constituting the ME grid itself. Alternatively, we may want to use the analogy of a 'coating' of field lines. Under extreme singularity induced grid curvature, this coating of our ST grid would 'come lose' and be replaced by a coating of mass/energy particles, forming the orthogonal ME continuum grid. Logically the 'lose' space/time particles would then shape particles inside our dual continuum. Extrapolating, it would not be 'allowed' for the 'free moving particles' of one continuum to enter the grid

of the other, as both are made of the same material. The particle would 'collide' with the grid causing noticeable field distortions. As such: Particles of our continuum -e.g. hydrogen nuclei- would collide and release **Energy** in the ME grid, while particles from the other continuum (gluons, gravitons) would release **Space** in our ST grid, defining e.g. the contours of our atoms. Most of such 'illegal' interactions would happen randomly near the Planck scale, causing quantum fluctuations occupying 'empty' space. However, particles that carry an **exact** integer of the grid defining Planck Length (or Energy) of the opposite grid would be 'materially synchronised' allowing them to 'bump' along the grid at fixed distances while releasing quanta of energy (ME grid) and space (ST grid) at fixed orthogonal 'clock' intervals. This would describe Electromagnetic radiation, making the photon a particle that belongs to both and neither continuum. The fixed ratio of 'space quanta' released per time unit defines its virtual speed limit C whereas the energy quantum released per mass unit defines the orthogonal energy intensity of the EM field itself.

1.11 Heisenberg's uncertainly principle classically explained.

Heisenberg uncertainty principle' is a quantum law that states that it is impossible to know both position and momentum of an object at the same time. To demonstrate this effect, a single slit experiment is often conducted whereby a vertical slit aperture is gradually closed and, rather counter intuitively, the photons start to land horizontally (see picture to the right). The prevailing QP explanation is that '...by knowing increasingly well where the photons are, their momentum somehow 'spreads out' in the horizontal position...' There are however serious inconsistencies in this QP 'explanation' and the The Dual Continuum can explain Heisenberg's uncertainty principle far better than QP:



The QP explanation:

1. QP attributes duality and the uncertainty principle to the particles themselves and it states it is just 'not allowed' to know both location and momentum. This however, is not an explanation but a mere problem description.
2. QP suggests the uncertainty of momentum is expressed by the horizontal photon projection above. But momentum in ST terms is defined as $[kg \cdot m/s]$ which is not consistent with the cm-scale of the x-axis projection.
3. QP suggests the horizontal projection line represents the uncertainty of momentum of all photons coming through. But there is no explanation why this horizontal dilation only happens at the centre and not over the entire Y axis. An orthogonal projection seems part of the solution, but there is no such mechanism within QP.
4. QP mathematically correctly relates the equal-distanced photon 'diffraction' pattern to the relation between slit aperture and photon wave length. Diffraction caused by edges is however is not a strong physical explanation.

The Dual Continuum explanation:

1. Duality and the uncertainty principle are not related to particles but to the dual continuum setup. Δx is related to ST grid movement while Δp is an energy term, related to its orthogonal ME grid movement. Thus the ME movement aspect simply never coincides with just one point in ST and vice versa, hence the 'uncertainty'.
2. In our world, the ST continuum is dominant but the ME continuum is still present. By narrowing the vertical slit aperture, we artificially disable x-axis propagation of photons in the ST continuum after passing the slit. One could say the photons experience a near-spatial singularity in the x-axis direction. In contrast, ME grid propagation of the photons remains unaffected since all photons that do pass, still have full energy.
3. As a logic consequence, the photon x-axis propagation of the ME continuum now starts filling the void of the blocked photon x-axis propagation of the ST continuum. Since this always involves 'orthogonal wrapping' of field lines (see caption above) the Y axis photons are used, causing the x-axis 'smear' to appear only at the centre.
4. Effectively, the x-axis now displays the spiralled ME energy field windings of photon propagation in the ME continuum 'heads on', explaining the 'diffraction' pattern! The number of windings is a function of λ and the slit aperture. Each single photon runs time-instantly through the entire spiral, which is why the 'diffraction' pattern' also occurs if fired one by one.
5. The windings become less in number but get more stretched out and better observable as Δx decreases further. Effectively there is now a 'virtual and sliding x-axis cm-scale' combined with a fixed y-axis cm-scale.

There are a few additional things to consider;

- First of all, the narrowing slit experiment is unique in the sense that it 'collapses' **SPACE** grid propagation of photons, if only in the x-axis direction. This transfers the particles into the ME continuum. Normally QP experiments do the opposite: They measure **ENERGY** of photons and thereby 'collapse' their ME continuum grid propagation or 'QM probability wave function', transferring the particle into our ST continuum.
- The inversed photon propagation along the X-axis is time instant, unless limits are imposed by the y- and z-axes.

Heisenberg's uncertainty principle classically explained.

This key principle entails the inner product of the two orthogonal continuums; Δx is the locator of the ST continuum, while Δp is an energy related term, representing the locator of the ME continuum.

$$\begin{array}{lcl} \text{ST term} & \text{ME term} & \\ \Delta x & * & \Delta p \geq \frac{1}{4\pi} * h \\ \Delta x & * & [\Delta M * v] \geq \frac{1}{4\pi} * h \end{array}$$

Since the equation involves both continuums, the ME terms of 'mass' and 'velocity' first need to be adjusted to their dual dimensions to reflect consistent interpretation in ST terms:

$$\begin{array}{lcl} \Delta x & * & \Delta t[s] * v_{dual} \left[\frac{m^2}{s^2} \right] \geq \frac{1}{4\pi} h \\ \Delta x [m] & * & \Delta x_{dual \text{ surface}} \left[\frac{m^2}{s} \right] \geq \frac{1}{4\pi} h \end{array}$$

In dual terms ST momentum is now expressed as 'surface' per sec. Earlier it was demonstrated how vertical ST field lines wrap into an ME orthogonal spiralled 'surface'. By approximation, the radius is then defined by a multitude of 2π rotations, whereby r equals $1/2 * \Delta x$. This 4π 'momentum to Δx ' adjustment is why Planck's constant is divided by $\frac{1}{4\pi}$.

- The above synchronised formula can explain the actual experiment; When narrowing the slit until the orthogonal projection on the x-axis gets visible, each further ST Δx narrowing will mean an equal relative widening of the x_{dual} axis projection representing the diameter of the spiralled ME surface.
- Notice Planck's constant dimensionally changes in $[m^3/s]$ reflecting 'space time' itself.

To confirm, one could measure the time delay between production and landing of 2 photons; one near the centre versus the other further away. There should be no time difference regardless of distance from the centre!

1.12 Dual notations of h, G and gravitational force.

In pure ST terms, Planck's constant thus appears to have the dimensions of spatial flux $\left[\frac{m^3}{s} \right]$ as derived above. With this we get a clear physical meaning: A photon oscillates between the ST and EM continuum and each time it enters the ST continuum it can only create extra cubic space with a fixed amount per second, equal to Planck's constant. If its amplitude is low (producing a smaller sphere per cycle) than it must have a higher frequency to deliver the same amount of 'displaced space' per second. Inversely, in the ME continuum it must deliver a same amount of energy per mass unit. Like the Lorenz factor earlier it appears Planck's constant ensures the correct balance for all E/kg speeds (intrinsic energy). We can now also express the gravitational constant in ST dimensions only; it changes as follows:

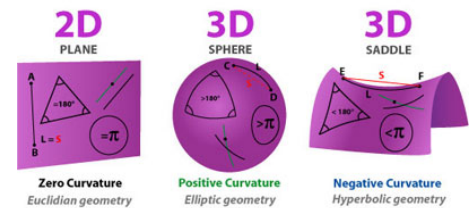
$$\ell_P = \sqrt{\frac{\hbar G}{C^3}} \rightarrow \ell_P = \sqrt{\frac{h \left[\frac{m^3}{s} \right] G}{2\pi C^3 \left[\frac{m^2}{s^3} \right]}} \rightarrow G = \ell_P^2 * \frac{2\pi C^3}{h} \left[\frac{m^2}{s^2} \right] = k_{gr} \left[\frac{m^2}{s^2} \right]$$

G is a (radial) surface deceleration term expressed in $\left[\frac{m^2}{s^2} \right]$ or in 'native' terms: $\left[\frac{J}{kg} \right]$. In the next paragraph we will derive that the dual or 'shadow' effect of an object's 'inertial mass' [kg] is a particle induced field-clock effect expressed in **seconds**, not kg's. Dimensionally we get:

$$F_{grav} = G * \frac{M1 * M2}{Dist^2} \text{ or: } F_{grav} [...] = G \left[\frac{m^2}{s^2} \right] * \frac{M1[s] * M2[s]}{m^2} = [\text{dimensionless}]$$

Thus, corrected for the dual dimensional settings, the gravitational force becomes dimensionless and appears to be a mere -local- quotient of G. Since we actually have a $4\pi m^2$ in the surface denominator at the right side this suggests F_{grav} is a geometric function of π in which case any π value different from 3,14159 determines the local curvature in Riemann space.

DIFFERENT TYPE OF GEOMETRIES



(studied by Omar Khayyam, Girolamo Saccheri, Bernhard Riemann, ...)

Dual shadow functionality

In the continuum setup table, one can see what the off-setting dual effect is per dimension in the ME continuum. It therefor appears there are two rules for this 'shadow application' in our ST continuum:

1. The ST dimension carries into the ME continuum, and translates back with particle-field inversion
2. The ST dimension carries into the ME continuum, and translates back with base unit inversion

Examples:

Mass & Energy: In the ST continuum the function of 'mass' is 'inertia' as in Newton's force law. Its ME dual functionality is time. Applying the setup rules above, the shadow ST effect of mass is the dual function of clock, expressed in time (seconds) and it does not impact the **particle** but the **grid** directly around it. Given that the clocks of mass and time always have opposite signs, this clock influence must be negative. In other words; To the ST observer we experience a radial 'time' contraction inside the space around the massive object.

Space & Time: Analogous, the shadow effect of the particle property of 'energy' will be a negative radial **spatial** contraction in the grid around it. Combined mass & energy of an object will thus cause a radial spacetime contraction around it, describing the effect of gravity. Another application is the energy or 'relativistic mass' of photons:

$P = M_{rel} * C$ and $P = \frac{h}{\lambda C}$ And since Planck's constant of 'h' was earlier derived to be spatial flux $\frac{m^3}{s}$ we get: $M_{rel} = \frac{h}{\lambda c^2} = [s]$. Earlier we already arrived at the conclusion that shadow effect of mass results in 'seconds' which in turn renders the 'gravitational force dimensionless given $G = [\frac{m^2}{s^2}]$. This is symmetric to the shadow effect of a particle's energy in radial 'meters' contraction, which renders also the electric force dimensionless; In HLU terms (Heaviside-Lorentz Units) $F_{electr} [...] = \frac{q_1 * q_2}{4\pi r^2}$. Notice the inversed radial surface component of 4π -the surface of a sphere- in the denominator. This is exactly the shape of the ME grid we earlier derived as we depicted the quantized spherical ME grid 3 wrapping all 3 axes. Speaking of grid properties; since we have shown via simulations that the opposite grid typically appears spiralled to ST observers, we need to realise that our own galaxy actually appears spiralled to us. As such we get a first hint that somehow we would be inside a singularity of some scale. Chapter 4 describes this in more detail but having derived Plank's constant h and gravitational constant G in their ST terms, we can already see the dual effect inside spatial singularities in ST terms only, without the need of QP:

$$S_{Black\ h} = \frac{C^3 \kappa A}{2\pi h G} = \frac{\left[\frac{m^3}{s^3}\right] \kappa [m^2]}{2\pi \left[\frac{m^3}{s}\right] \left[\frac{m^2}{s^2}\right]} = \frac{\kappa}{2\pi} = T_H$$

In closure: 3D vision

The concept of the Dual Continuum is comparable to the known concept of 3D stereo vision using dual coloured glasses. We all know the double 2D prints of objects in red and cyan. These prints look blurry, yet when using the red-cyan glasses a 3D image appears as by magic. We may compare the 2D picture to QM: It looks strange and double but it is actually correct. We *think* our ST vision is working just fine, but we need to augment our vision by putting on our 'dual continuum' coloured glasses if we want to see what is behind the QM picture.

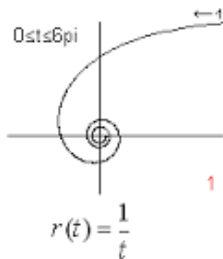
For those who are still somewhat reluctant to accept that besides Space also Energy can function as grid locator: If prompted to choose whether humans live in a Spatial world or an Energy world, we are inclined to say everything revolves around space and distances in our lives. Yet...there are no yardsticks growing on our limbs and our eyes do not measure distance but *energy* of incoming photons. Our ears measure *energy* of incoming air pressure waves. Our skin measures kinetic and electric *energy* to gauge heat and touch. Our brain next produces a primary energy grid picture and computes it into a derived spatial grid picture which may or may not be a reality. Apparently our brain is already programmed with dual continuum logic without us realising it. Taking it one step further it almost seems as if from the days of first amphibious land-life some 500 My ago most species biologically evolved from an energy based to a spatial based life form. In chapter 4 we present an absolute stunning event in Earth's history which could very well be in line with this thought....

2. The dual continuum and the atom

In this chapter, we will discuss various consequences the dual continuum setup would have on the sub-atomic particle level. With no particular expertise in this field many concepts will likely be valid, if not perfectly formulated.

2.1 Particle transition

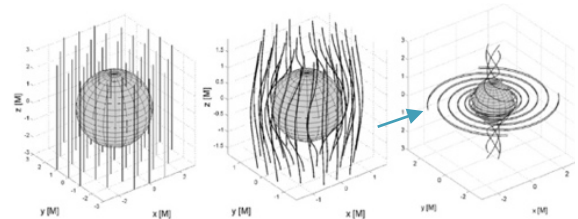
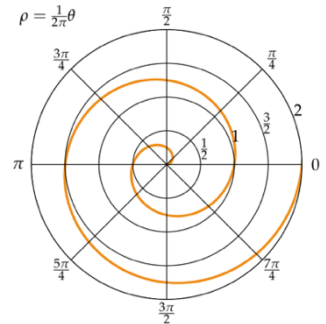
Following the dual continuum setup, any particle nearing ME continuum conditions would increasingly be forced to move in dual terms. Given the dual speed notation - $\frac{m^2}{s^2}$ (or J/kg), from our ST perspective, it would thus need to start moving in the form of an orthogonal surface, by spiralling around its vector of movement in near time-instant and ultimately in equal spaced Planck length separated windings. Equal windings imply following a $\frac{1}{2}\pi$ based 'Archimedean' spiralled grid (*right*).



Alternatively, one may say that given the orthogonal mass clock, from our ST perspective, the objects linear motion would be along the relation $E=1/M$ (*to the left; replace t with M*)

Nearing the final Planck winding the spiralled surface would become a 'pivoting' surface, transforming into an orthogonal spiralled energy grid with equal energy spacing, while mass is stretched along it as orthogonal clock.

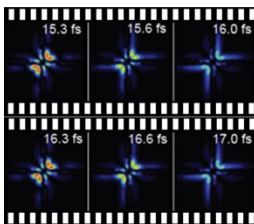
This phenomenon of a pivoting surface is reflected by the definition of Planck's constant in $E = h * f$, [$m^2 kg / s$]. Notice that the predicted top-down inward spiralling movement followed by pivoting surface is *exactly* what actual singularity simulations showed (*to the right*).



2.2 The Bosonic atom model; geometry and force carrying particles

The current view of an atom gravitates between the ancient Rutherford-Bohr model of 1913 and the modern 'charged cloud' model, reflecting once more the 'evergreen' particle vs. probability wave discussion. Neither is fundamentally satisfying. In the previous chapter, we showed that the application of the Dual Continuum concept leads to a third, radically different and deterministic ('Bosonic') atom model, via two deductions:

1. There is a spatial 'singularity-like' situation between orbit and nucleus, allowing time instant movement inside-out
2. An electron is a ST continuum superposition of an atom bound photon. It is this photon that makes 'quantum' leaps.



Next we presented actual simulations AND photographic evidence of The Max Planck Institute, supporting this new setup. With the new model humanity has come full circle describing the atom; We are back to concrete shapes and deterministic events such as bend spiral arms that pierce the atom's outer sphere-shaped border with its opposed continuum, resulting in dual intersection discharge points we call 'electrons'. The strength of this new atom model is that the very same shape also describes galaxies and potentially even our Big Bang singularity.

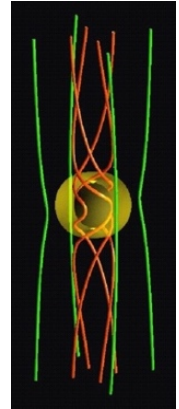
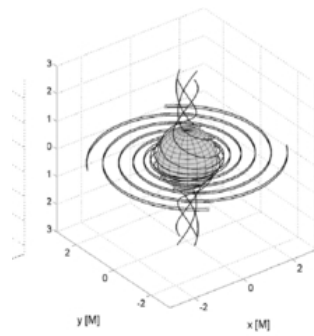
This all results in a less prominent position of 'elementary particles'. We don't need to study them in order to form an idea how fields and forces work. It is quite the reverse: Intersections of higher order shapes interacting, provide the points and lines in either the ST and ME continuum where electricity or space 'discharge'. Such point discharges are the result, not the cause of the intersections! More over; it would appear there are no fundamental forces at all, only motion induced curvatures of the ST and ME grid on the various scales, which admittedly at any given grid point can be quite complex. So although the resulting intersections points (including the so called gauge bosons) have specific characteristics (mass, spin, charge, size) we are fundamentally mixing up cause and effect by speaking of 'force carrying particles'. Nevertheless, in this chapter we will stick to a more 'particle' oriented approach, just to show that the new DC model is also congruent with particle physics.

2.3 The atom bound photon trajectory

As mentioned earlier; following the various simulations of singularities bending electromagnetic field lines, we take the resulting spiralled (folded) and oscillating string model as the default shape for our atom. We will now take the particle position and imagine a photon coming in from above (e.g. because the vertical fieldline connects to an above situated identical atom forming a chemical bound) and follow its path;

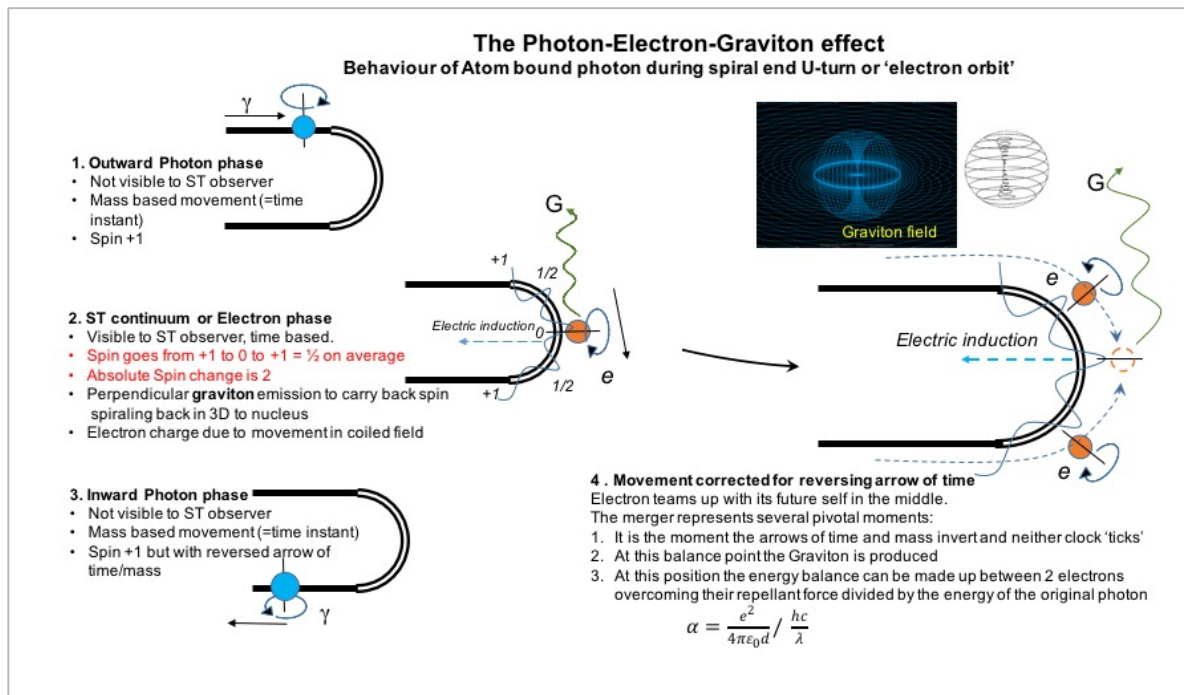
As such:

1. The vertical field lines represent ST continuum conditions;
2. The orthogonal horizontal spiralled fieldline arms represent its trajectory in the ME continuum
3. The 'U-turn' at the spiral-end is again vertical and thus subject to ST continuum conditions (!!). After this it moves spiralling inward again



The photon would travel along the along the outward spiralled and folded field lines constituting the opposite EM continuum. The spiral ends or 'U-turns' have identical and fixed distances from the centre (expressed in Planck Energy units). Arriving at the spiral ends, each photon would next make the U-turn during which it would travel *vertically* again. This means it travels in ST, becoming visible as it electrically discharges in time, before heading back time instantly once more. As such, we have to get rid of our ancient idea of an 'electron orbit'. There is only the stroboscopic and orthogonal collection of equal distanced electron discharges. This U-turn is of course the most interesting event and particle-spin wise, as illustrated below, three important events would happen during this period:

1. The photon-electron mutation 2. Reversal of its arrow of time 3. Emittance of a graviton



a. The photon-electron mutation and the illusion of electron orbits

The photon will change its spin from +1 to 0 and back to +1 again, resulting in an **average spin of $\frac{1}{2}$** , suggesting an electron superposition, just as predicted at paragraph 1.7 ! Again, notice that to the ST observer only the electron phase is visible as the entire internal photon spiral phase is time instant.

b. Reversal of arrow of time

At the middle of the electron turn there is a spin-zero moment relative to the electron plane, marking the reversal of the arrow of time for the electron. This suggested changing arrow of time is an element of the dual continuum logic for all singularities as already mentioned in paragraph 1.4. It simply means that from a certain point in time all future movement (flow of ST position slices) comes in at reversed order from 'our' perspective. Effectively this means that for the outside ST observer, the electron seemingly arrives and merges here together with its future self in reversed time,

overcoming its own repelling force, but using the two different trajectories of the double spiral arm! This phenomenon in general would represent the solution to Loschmidt's paradox. Notice how consistent this is with the earlier description of the two intersection points of a bend EM fieldline crossing the ST boundary!

c. Release of a graviton

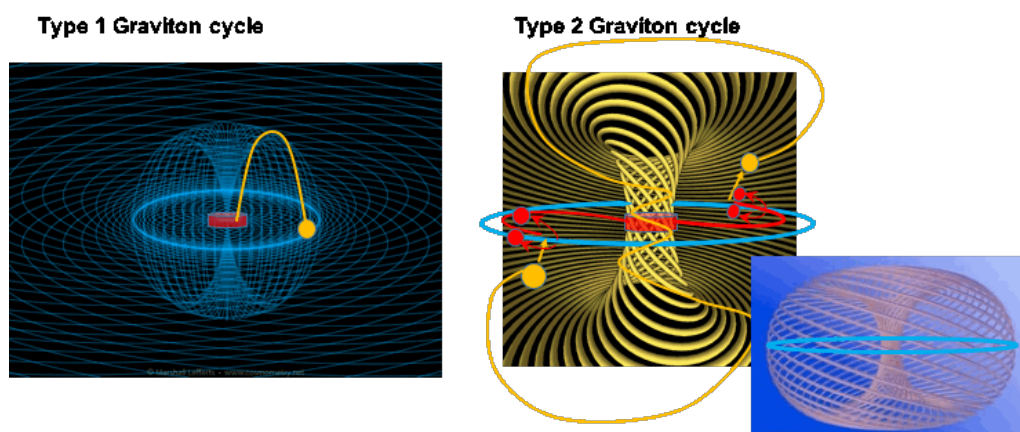
As a next point of attention; although the electron's average spin is $\frac{1}{2}$ during the U-turn, its **absolute spin change is -2** which would have to be compensated by emitting a spin 2 gauge boson (graviton) spiralling in 3D back to the centre. We will coin this process the '**Photon- electron- graviton effect**'. Finally, during its coiling movement the electron itself generates an electric charge leading to an electric 'force' pointing towards the nucleus.

2.4 Graviton functionality: defining the atom's space and mass

Gravitons have never been detected as individual particles (in terms of mass or energy at least!) and as such are not officially part of the standard model of particle physics. In the 'Bosonic' atom model the graviton would be a crucial particle, carrying back and forth 'spin' much like 'blood transports oxygen in the human body'. Additionally, gravitons would produce the atom's spatial hull and inertial mass as discussed next:

a. The graviton's trajectory and spin exchange

If indeed gravitons next carry back the surplus photon spin, there might be two types of trajectories: An orthogonal trajectory (type 1) ending at the centre. Or a more skewed trajectory (type 2) spiralling around the centre but ending up at the other side of the 'electron' orbit.



Perhaps both trajectories occur. The key difference is that in type 2 the graviton (yellow) would have a photon vertex interaction with two different photons (red); first with a photon arriving at the electron orbit (generating the graviton) and next with a photon departing from the electron orbit at the opposite side (absorbing the same graviton). In the 'straight' type 1 trajectory the graviton would transmit its spin onto a circular shaped central boson (Higgs) through which all field lines run. The Higgs boson would next transmit the spin upon creating pairs of W, Z, gluons or photons. In all cases, due to symmetry, any secondary graviton interaction should again involve a change in the arrow of time for particles involved. The graviton itself does not have a time reversal, explaining its renormalization problem.

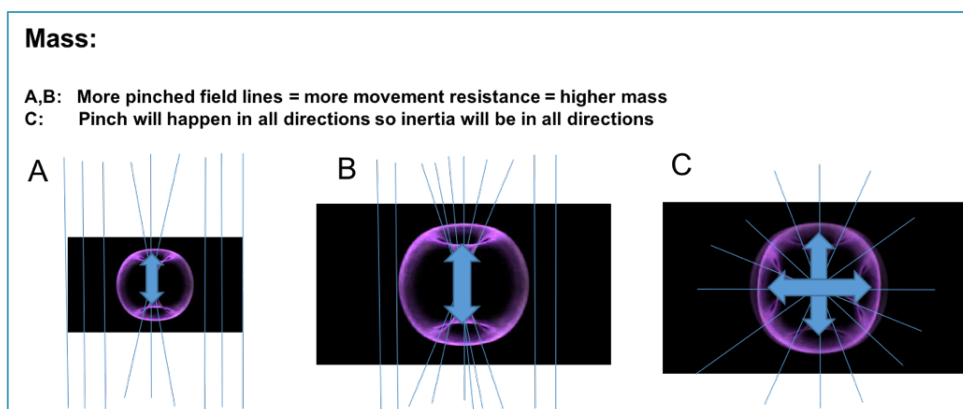
b. The spatial shape of the atom

The dual continuum setup suggests ST field lines and gravitons are made of identical material: Space and Time. This means that during the inward spiralling towards the nucleus, there will be an element of grid interaction as the graviton - loosely- 'sticks and slides' along ST field lines. Thus, both type 1 and 2 Graviton-Grid interaction will release Space while interacting with the ST grid the same way we earlier argued hydrogen nuclei release Energy when interacting with the ME grid. **This released space would constitute the outer shell of every atom!** 'In retro-action' it creates spatial distance between the outer electron 'orbits' and the nucleus, giving the atom a temporary spatial 'exo-skeleton'. As such, the most illusive particle of all may actually be the most observed ever.

c. Pinched field lines, mass and gravity

The interaction of the inward spiralling gravitons with vertical ST field lines would cause a 'drag' or '**pinch**' of vertical fieldlines, making them run through the middle of the atom, with potentially only the outer field lines actually being bend into horizontal spirals. This pinching effect would then have three important effects:

- 1) Pinching the field lines through the centre effectively 'clears' the area between nucleus and electron orbit from all vertical ST field lines; this explains why atom bound photons can next spiral outward time instantly.
- 2) With pinched field lines running through its centre, it will be more difficult for the entire atom to move along the otherwise straight field lines of the ST continuum, hence the pinch constitutes inertia or **Mass**. The un-pinching would happen instantly once the gravitons reach the centre, but on average there will always be a net 'distorted' convex situation. Below a simple convex illustration is provided. In reality the 'electron orbits' continuously vary in angle so the pinches would occur over the entire atom sphere causing inertia in all directions (C).



One may imagine that an object that manages to keep the electron 'orbits' of its atoms aligned (B), would develop a strong pinch gradient. Nearby objects with a similar pinch gradients would align to this field, which would in effect describe magnetism. Moreover, since magnetism, like ST, is orthogonal to the ME continuum, it would coincide with the direction of ST field lines, even though it would have an extra electric-related origin.

- 3) The periodic pinching and (partly?) wrapping of ST field lines would also mean a *shortening* of the vertical ST field lines which would be felt in all directions and over great distances. Again, this would be the mechanical principle behind curved spacetime and thus *gravity*.

The suggested semi-loose interaction of gravitons with field lines ('strings' when assuming the ST field lines also connect in a U-turn) is actually similarly discussed in string theory:

Gravitons in speculative theories (Wikipedia on gravitons:)

...A feature of gravitons in string theory is that, as closed strings without endpoints, they would not be bound to [branes](#) and could move freely between them. If we live on a brane (as hypothesized by [brane theories](#)), this "leakage" of gravitons from the brane into higher-dimensional space could explain why gravitation is such a weak force, and gravitons from other branes adjacent to our own could provide a potential explanation for [dark matter](#). However, if gravitons were to move completely freely between branes, this would dilute gravity too much, causing a violation of Newton's inverse-square law. To combat this, [Lisa Randall](#) found that a three-brane (such as ours) would have a gravitational pull of its own, preventing gravitons from drifting freely, possibly resulting in the diluted gravity we observe, while roughly maintaining Newton's inverse square law.^[13] See [brane cosmology](#).

The above rather closely describes what is argued in this paper; The graviton rotates around and pinches the ST field lines, yet as a self inflicted secondary effect the increasing flux density towards the atom's core will cause the graviton to move to the core as well.

Neutrino's

Looking at the Torus shaped geometry of the 3D graviton trajectories at the previous page, gravitons would be the only particles to combine 'horizontal' ME and 'vertical' ST movement, suggesting it combines all traits; It loses energy, creates space, loses mass and gains time. Its trajectory would be an observational 'nightmare': Its virtual ST speed may exceed C , yet at the 'top' of its vertical trajectory towards the atom's core it would be near zero in ST terms, before accelerating again in the opposite direction downward toward the nucleus. In addition, and as discussed before, during the split electron discharge it would in retrospect create space (distance) between the electron 'orbit' and the atom's nucleus. From our perspective it would thus seemingly travel backwards in time, carrying the spin property of the couple of particles it created 'in the future' (in this case electrons, as in electron neutrino's). If we look at all these versatile traits, many appear consistent with what is attributed to the Neutrino, hence it may very well be that the Neutrino is the superposition of the Graviton in so far we can observe it in ME energy terms and analogous to the photon-electron superposition. The neutrino would then also have 'gravity waves' effects distorting spacetime which we cannot see, but might be made visible during an experimental setup at e.g. LIGO. One could think of Laser-like amplification of in this case neutrino's.

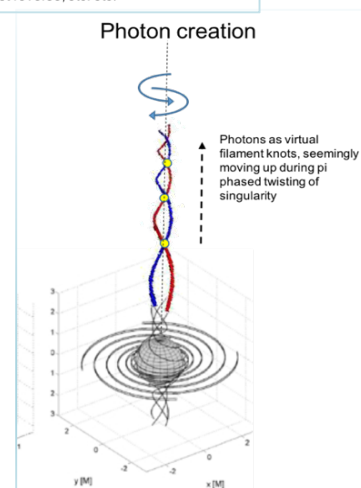
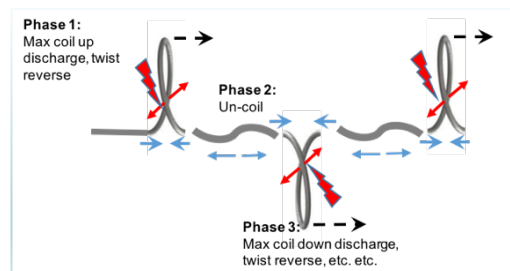
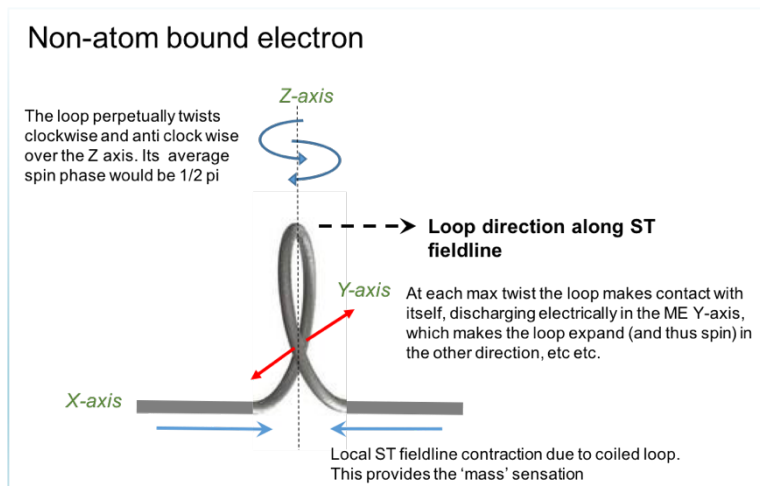
Taking the electric discharge perspective; the free electron

One might also look at the electron/photon from a mixed particle/wave perspective; The electromagnetic fieldline ('wave') entering the ST would discharge at its highest point of curvature, where its surface charge density $\sigma = \frac{Q}{4\pi R^2}$ is maximal, which in ME terms constitutes maximum speed. As such, any extra incoming photon at the right energy (distance) increases this velocity so the electron would be 'knocked' out of its 'orbit'.

2.5 The free electron, free photon, Dual Quantum Field Theory

Since we depicted the atom bound electron as a $\frac{1}{2}$ pi ST piercing fieldline, the question is whether the 'knocked-out' electron would be a cut-off piece of fieldline, becoming an autonomous closed (?) loop string, leaving a damaged open string at the atom's end. This is non-desirable as we'd like to think of field lines (strings) as 'nearly' indestructible shapes. Moreover, in string theory the electron is not a closed loop.

Alternatively, we may be able to design a more suitable shape; preferably it would still have the pi U-turn and half pi on-average property. But it also has to contain an element of autonomous ST grid contraction since the electron has mass. Given its net-convex inertia, this ST contraction has to be compensated by an opposite net-concave electrical discharge ME effect. Combining all these properties one could construct the hypothetical electron picture below left:



The electron loop twist above looks good. However, 'free' electrons are measured as having only spin up or spin down, which might imply the discharge needs to be at opposite points. In that case the stronger phased version to the upper right might apply.

Similarly, we want to design a string-like fieldline representation for the photon: Since the photon has no mass, it cannot have a ST contracting loop, meaning its ME propulsion needs to be virtual AND originate from the winding and unwinding of a bigger connected structure, e.g. the atom (to the right). Like an alternating current, the electromagnetic current would pulsate in all directions, while the intersection points would form virtual moving particles (yellow dots). An orthogonal spiralled situation of the photon drawing would then apply for the 'carrier' of space (the graviton). Given its orthogonal mass based movement we could not see it move, but it would complete the inert 3D quantised spacetime field of the ST continuum ('ether'). In all we get to a perpetually balanced kind of dual $2 \times 4 = 8$ dimensional interaction (3 energy, mass, 3 space, time) field, where each particle has its own specific vibration signature. Different groups (families) of particles may next use different scaled singularity induced versions (string theory: 'brane level') of a similar **dual field design setup**. But a particle would NEVER have its 'own field', as this would destroy the concept of balanced dual functionality. We may coin this the **Dual Quantum Field Theory (DQFT)**, given its similarity to the idea of QFT.

2.6 The nucleus of the Bosonic atom model; gluons, Higgs, W, Z bosons

Though *highly* speculative, the frequency with which photon/graviton carried spin would be incoming and outgoing at the atom's centre, could very well cause physical ME grid vibration 'compartments' through which the pinched ST field lines run perpendicularly. As such, one may look at the amazing figures below where grains are evenly distributed over a plate that's starts vibrating forming changing compartments as frequency increases.



<https://youtu.be/vwJAgRU>

Similar sliced compartments might confine the pinched ST field lines running perpendicular through the centre. Depending upon a compartment being open or closed, these might define the differences between the various 'glued nucleons' of 'protons / neutrons / quarks'. In addition, Gluons, W and Z bosons could then be the specific 1D and 2D ME fieldline intersections at these compartments. The Higgs boson might have a key role, balancing and distributing the

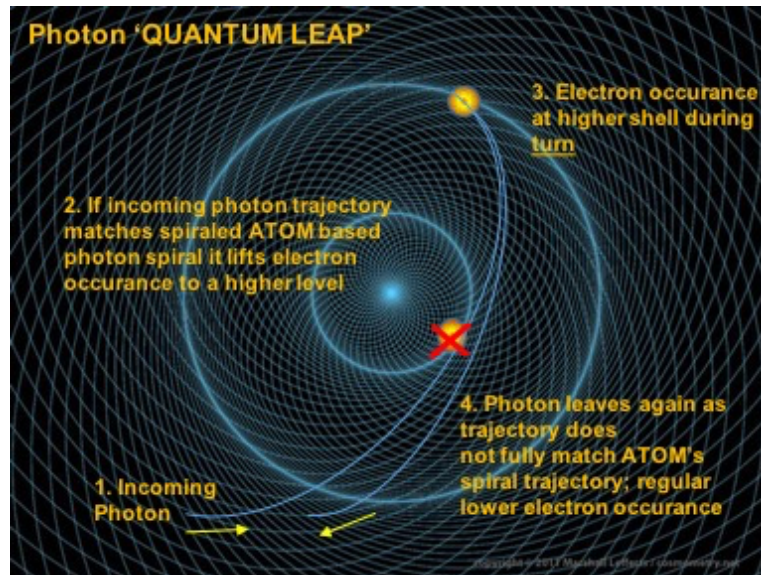
spin in- and outward. As with electrons and photons we would much prefer to express all gauge bosons as the result of oscillating ME/ST field intersections at smaller scales, not so much as 'loose' particles that 'carry' a force.

2.7 The photon quantum leap, EM radiation

In closing a few other things can be said about photons and electromagnetic radiation.

a Photon quantum leap

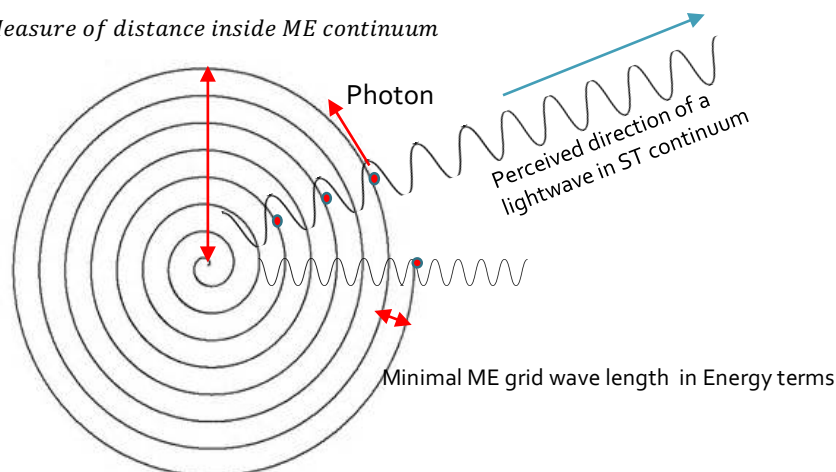
Below a visual, how the process of 'photon' quantum leaps would unfold according to the dual continuum setup:



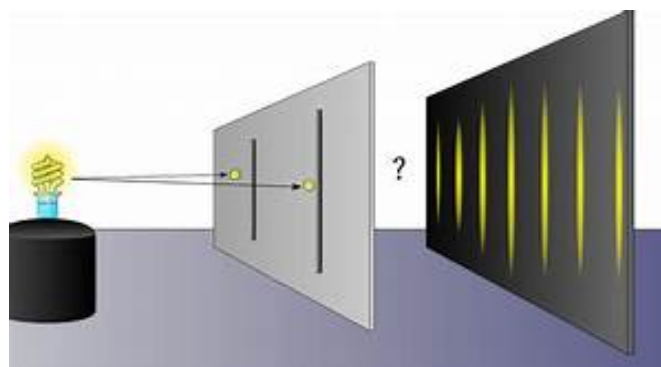
b. The (atom bound) photon

In terms of the ST continuum, 'light' or electromagnetic radiation in general, is arguably a special case in the sense that they are the only photons we can actually see. Arguably it *might* not be true that they need to be an exact manifold of Plank Energy, it is just that as ST observers we can only see the ones who **are** (!), otherwise they do not align on a straight line for the us to see, as displayed below: **This would of course be true for all things 'quantum'.**

$E = \text{Measure of distance inside ME continuum}$



2.8 Solving the double slit experiment



The double slit experiment can be resolved in the same manner as the single slit experiment earlier. We also get an answer with respect to the influence of (delayed) detectors. The dual continuum offers two solution choices:

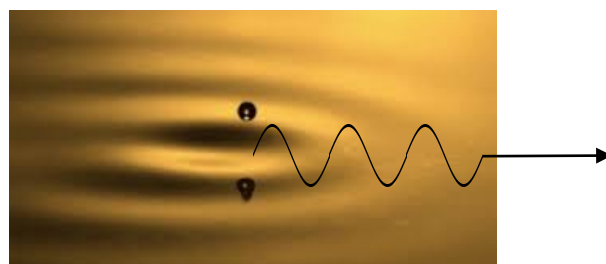
Version 1

Crucial to understanding what happens is the acknowledgement of there being 2 grid locators, not one. Like in the single slit experiment, the double slit experiment again creates a no-go area for spatial movement in the area directly behind and between the two slits. The suppressed wave-locator of Energy again takes over, getting enhanced by monochromatic wave interference between the two slits. Given the ME locator is dominant here, we would again be looking at an orthogonal projection, meaning we are looking at the horizontal interference pattern of both slits, displayed vertically. But this is not relevant for the rest.

The complication here is with the placement and activation of detectors. To explain we first we need to look at the characteristics of the ME locator: The dual continuum suggests that the ME locator acts time instantly. Moreover, its position slices come in reversed order for the ST observer due to its reversed arrow of time.

This means that the ME location pattern behind the slit partially comes back *through* the slit towards the source of the photon / electron, even before the photon leaves its generator on the left. This 'fork' of ME location is the suppressed locator for as long as the photon travels in ST towards the slits, but it becomes dominant once the object itself physically passes through one of both slits. Notice that its ST passing of the slit is not detectable with an 'Energy detector' only with a theoretical spatial distortion detector. All that an energy based sensor does -whether in front or after the slit-, is to instantly destroy the ME fork.

As an addition, it might be that as the particle is on its way towards the slits, the 'lightning fork' ME locator influences the particle's ST movement like a 'pilot wave', as De Broglie proposed back in the 1927. This might guide it to its ST slit passage and next dominate the further landing behind both slits.



Version 2

There is an alternative to the above, namely that the two grid locators remain orthogonal, meaning the landing as detected by an Energy discharge on the screen does NOT reflect the landing location of the particle in Spatial terms on that same screen. In this scenario the instant ME interference locator fork remains a complete separate and unimportant construct, as the particle simply always lands invisibly behind only one of the two slits in ST terms. Upon landing behind any of the two slits, its tiny impact energy would collapse the ME locator fork, making it act as a probability generator for the discharge of the ME locator anywhere on the interference stripes on the screen. If we follow Heizenberg's uncertainty principle than this version would actually be preferable. Then the entire 'interference show' on the screen would be nothing but a 'magician's distraction' from the actual ST landing exactly behind the two slits. One may collect the ME fork data and look at a delayed moment, which would similarly disturb the fork making it collapse only then as a complete separate locator structure.

We would know for sure which version it is if we could measure a tiny 'spacetime' distortion behind one of the two slits only, and thus at a different location than the ME discharge on the screen. Perhaps it is possible to set up a 'LIGO'- like spacetime distortion experiment to determine which of the two options it is.

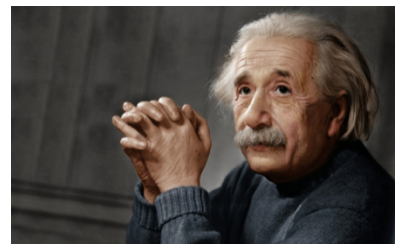
3. The dual continuum and gravity

Gravity may well be the single most contemplated aspect of physics. Although Einstein's general relativity (GR) provides the undisputed and correct mathematical description of its remote working via curved space time, the exact tangible mechanism is still not understood. The dual continuum corrects and completes GR.

3.1 Mass, general relativity and the ether problem

Since Einstein, there has been a lot of debate on gravity but close to no progress. A century of QP did not deliver on a quantum theory of gravity and leading physicists recently started renewed interest in ether: There simply has to be some medium for electro-magnetic waves to 'wave' in and a fabric that accounts for 'bent space'. Concepts like 'fields' or 'force carrying particles' are mathematically nice but only add complexity. Instead we need a simple, direct and tangible grid related mechanism which brings us back to the realm of -new- ether, something Einstein was actually a strong proponent of. To illustrate, below are his closing words from a lecture on ether in Leiden (1920):

'...Recapitulating, we may say that according to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether. According to the general theory of relativity space without ether is unthinkable; for in such space there not only would be no propagation of light, but also no possibility of existence for standards of space and time (measuring-rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it....'



It is deeply ironic and historically incorrect that Einstein came to be known as 'the man who did away with ether', whereas in fact he was a strong proponent. True, he deprived of this ether the idea of motion, but this would be a 'relative' restriction which has no meaning in case all 'ponderable' objects we observe –including ourselves- are mere excitations of the very fabric the ether is made of (see *DQFT*)....Einstein nevertheless correctly felt the solution to gravity had to lie in some sort of ether, but he just never got to solve the inherent energy problem that comes with it. More specific:

Mass impacts the movement of other objects either directly via transfer of momentum or via curved spacetime. Given the effects are in essence similar, it follows it must take energy to bend spacetime and next require unlimited energy to resist normalisation of that same curvature, something which would conceptually be needed for General Relativity to work. There is an implicit but obvious energy deficit here. As an analogy we may think of holding a bar magnet inside a copper coil and expect perpetual electricity to float as a result.

So basically Einstein had to choose between two evils; either his theory of GR could not entirely be explained via mass induced curving of spacetime, or he had to give up on his equivalence principle of $E = MC^2$ stating that Mass equals a large but **FINITE** amount of energy. It appears Einstein did not want to risk losing either achievement and basically ever since tip-toed around the subject using evasive intricate wording as did those who studied gravity after him.

With the dual continuum concept, we can now see that the entire riddle is based on two flawed human assumptions:

1. $E = MC^2$ is **not** an 'equivalence' relation. Fundamentally Energy is as much equivalent to Mass, as Distance is to Time in the formula: Distance=Time*Speed. Both are simple **cyclical** 'movement equations' and nothing more.
2. It is **not true** that spacetime is constantly curved by Mass; There are two **cyclical** harmonizers in place. First there is the time instant 'normalisation' of spacetime (not noticeable for the ST observer). Secondly, there is a balanced Energy grid expansion in reaction to the spatial contraction effect of Mass. In addition, we may notice that the ME observer will have a reversed arrow of time and see both events inverted. For example; we observe our big bang galaxy as an expanding spatial gravity field while energy-wise we see it as a contracting field.

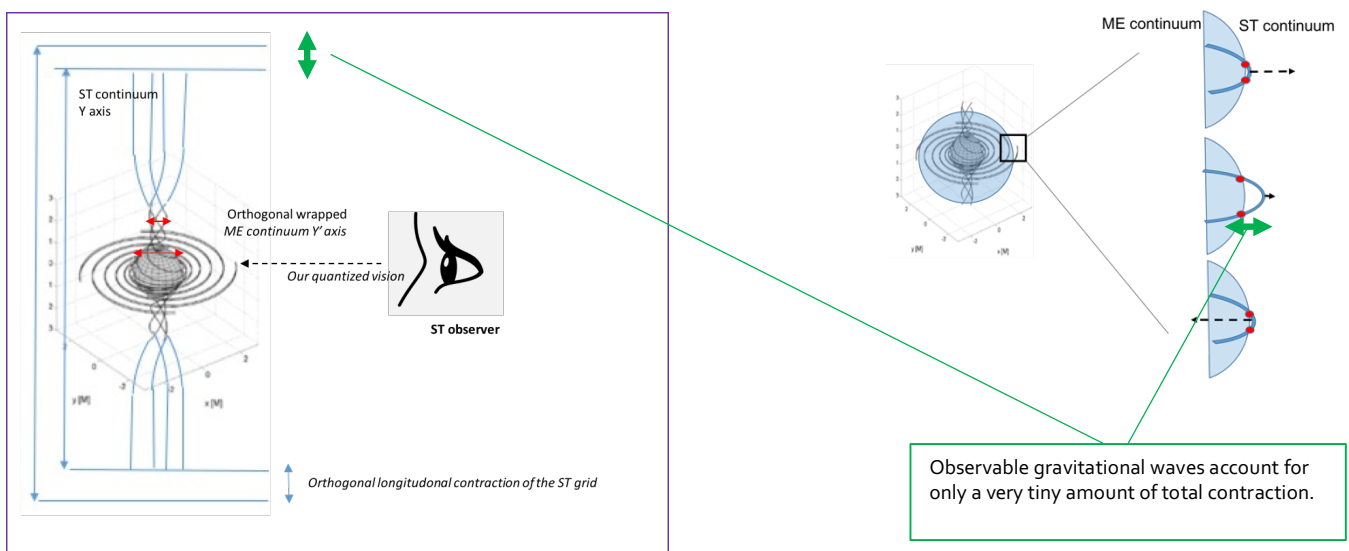
Einstein may be forgiven for not questioning his own tremendous achievements of $E = MC^2$ and GR, but all who came after him, should have noticed that besides the 'mass blamed' contraction of space time we also must deal with the energy coming from atoms in the form of 'perpetual' radiation of photons. In slightly different terms: we have a mass based continuous electromagnetic Energy field **surplus** whereas we also have a continuous mass based Energy **shortage** in relation to the energy needed for contraction of spacetime. Is it such a strange idea that both mass induced breaches of the 'Law of conservation of Energy' would cancel out? From there it is only a small step to link electromagnetism to gravity via the cyclical wrapping of tangible 'strings of ether' rather than sticking to the physically detached concept of 'force carrying' particles. With all recent observations, it seems almost a deliberate act of science to waste a century not embracing this perfect dual string symmetry which is so clearly put on display by Nature...

3.2 Gravity: the dual continuum effect of movement

At paragraph 1.6 and 1.9 we already discussed the origin of gravity, namely MOVEMENT of sub atomic particles in ME as well as MOVEMENT of fast moving objects in ST. Such movement is always functionally compensated by an opposite and equal movement in the other orthogonally arranged continuum expressed in $-m^2/s^2$. These constitute the spatial contraction effects in the ST continuum we call 'gravity' as derived in the above mentioned paragraphs.

3.3 Gravitational waves and the passing of time

As discussed earlier, the wrapped position of ME field lines leads to an orthogonal spatial contraction, which is not time based and therefore we cannot see them develop in time. They are 'instant' standing waves from our perspective. The only part of the contraction we can actually observe in spacetime is a moving gravitational wave, equivalent to the tiny portion of the orthogonal wrapped EM fieldline that pierces and discharges electrically in spacetime (see the green double arrow below). Therefore we can only observe a very weak gravitational AC-like wave travelling at the speed of light, whereas the bulk of the spatial contraction is fixed and instant -unless field lines are longitudinal elastic-. We as ST observer will therefore observe gravitational contraction (near) time instant whereas the accompanying observable but secondary gravitational waves would be limited to the speed of light.



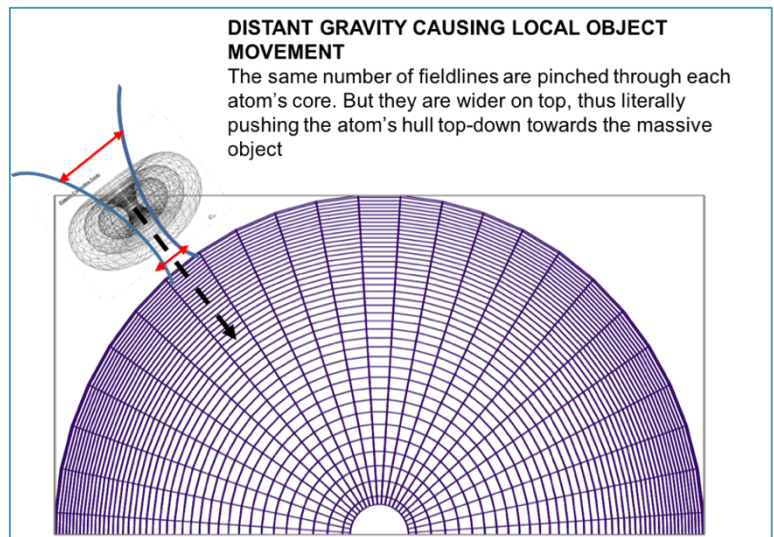
In literature, there is the philosophic question of whether Earth would instantly depart from its orbit if the Sun were to disappear or whether it would face a delay of 8 minutes (the time it takes for the Sun's light to reach us). The answer must first and foremost be that no mass-based object like our Sun can disappear instantly since this would require bigger than light speed which is not possible. So this would never materialise this way. However, in the theoretical case the Sun *would* vanish instantly, the bulk of spacetime contraction *would* disappear instantly, with a time based ripple of secondary gravitational waves following 8 minutes later by which time Earth would long have departed from its orbit...

In case spatial field lines are indeed longitudinal elastic, then we would not only have a high and relative speed of spatial contraction, but also a relative passing of time; To explain; elasticity means there will be (temporary) differences in tension of ST field lines, which the ST universe would seek to neutralize. Areas with little mass would typically be areas with 'loose' ST field tensions since only little fieldline length is wrapped up by atoms there. As a consequence, it would be logical that the atoms that are present there would be 'allowed' to wrap up more fieldline length in more windings in order to yet absorb their $kg \cdot J/kg$ oscillation momentum. This in turn would lead to longer atomic oscillation times, which in turn would mean a slower local mass based 'ME clock'. To the ST observer however, more 'instant' windings would have to be compensated by more spatial displacement, meaning in ST terms the local orthogonal time clock would tick relative FASTER since it is restricted by fixed oscillation per sec by Planck's constant.

Mass deprived areas would thus have a blue shift which would translate into a red shift, corrected for an inversed continuum view as we seem to have relative to our universe.

3.4 Gravitation transmission mechanism

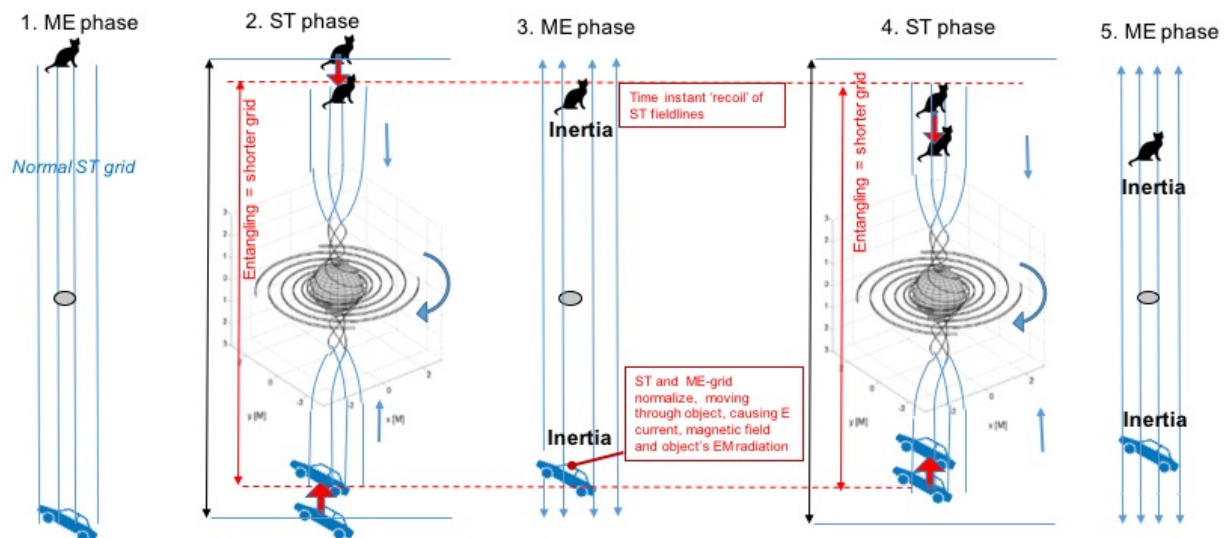
The transmission mechanism for the 'gravitational force' onto objects would be the flux density difference of the pinched ST field lines running through the atoms of an object. On average there will be a slight gradient as displayed on the right where locally pinched field lines would have more distance (energy) facing away from the heavy remote object. Trying to pinch all field lines equally, the oscillating atom would feel this as a bigger counterforce on its hull, thus pushing itself (and with it the entire object) towards the heavy object.



3.5 Spatial contraction and ME expansion

Next it is quite straightforward how spatial contraction and ME grid expansion alternate, resulting in the movement of objects and the emittance of photons.

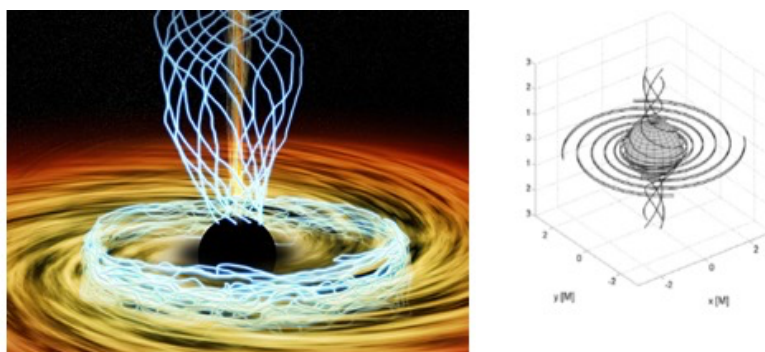
Gravity as a function of periodic atom based grid entanglement



- In-out photon phase.
- Electron / Graviton phase. Time **continuous**
- Out-in spiraling causes pinch and entangling of ST fieldlines
- ST grid shortens
- Remote objects move with grid contraction
- Outward Photon phase. Time **instant**
- Dis-entangling of grid towards normality
- Remote objects stay 'put' due to inertia
- ST and ME field move **through** objects causing electricity / magnetism / ME radiation
- Renewed ST fieldline entangling
- Remote objects move with grid contraction
- Etc. etc.

3.6 Gravity and magnetism

As suggested earlier, the entangling and disentangling of ST field lines would be similar for singularities of all levels, from atoms to universe. When looking at massive black holes, like Sagittarius A below, we get even more confirmation of this principle.



[Physicsworld IOP publishing 4 dec 2015 Blue haze: the magnetic-field lines that surround Sgr A*](#)

The first direct evidence of magnetic fields near a black hole has been found by researchers using the [Event Horizon Telescope](#) (EHT), who have seen such fields around Sagittarius A* (Sgr A*) – the black hole at the centre of our Milky Way galaxy. While such magnetic fields have long been predicted, this is the first time that they have been detected close to the “event horizon” of the black hole. Magnetic fields near a black hole are thought to power the huge relativistic jets that emerge from many accreting black holes and blast across thousands of light-years – shaping entire galaxies along the way

In addition: We mentioned how vertical ST field lines would gradually be ‘wrapped up’ due to the orthogonal energy grid spirals. Yet we also know since the days of Maxwell that magnetic field lines run orthogonally to electric field lines. As such – and as beautifully demonstrated above- in case of charged particles moving in the horizontal spiral, the magnetic field lines simply equal our ST movement field lines for these charged particles! Since these huge singularities don’t come by the millions and oscillate at a far bigger scale than atoms, we would not experience a cumulative radial gravity as on atomic level, but we’d ‘fall in’ via one of either poles –quite likely we already did-....

3.7 Direction of gravity

One can make educated guesses now how gravity would work at each of the various scales of the nested singularities that cause them and quite likely we are experiencing the accumulative working of all of them, constituting local G: There would be at least 3 scales:

- At the atomic level, the photons within atoms oscillate many times per second in several ‘planes’ and objects have many atoms oriented in all directions. As such ‘atomic’ gravity (the bulk of which we experience) is radial.
- Distant galaxies, apart from their atomic mass, would provide an extra longitudinal ‘galaxy’ contraction through their centre if their disk would be perpendicularly pointed towards us. Our own Milky Way galaxy arguably would not influence us with additional ‘galaxy’ gravity, yet one can expect there to be massive (graviton) influence at to the end of the spiral arms, just as with atoms. We would also see more mass as in ‘dark objects’ at the outer spiral arms. Minor black holes would add to such additional mass pull.
- ‘Big bang’ gravity would always apply, due to its directional ‘lobe’ setup as discussed in the final chapter. In addition, both galaxies and the big bang singularity oscillate slowly; as such we can experience on many occasions opposed arrows of time, relative to our universe.

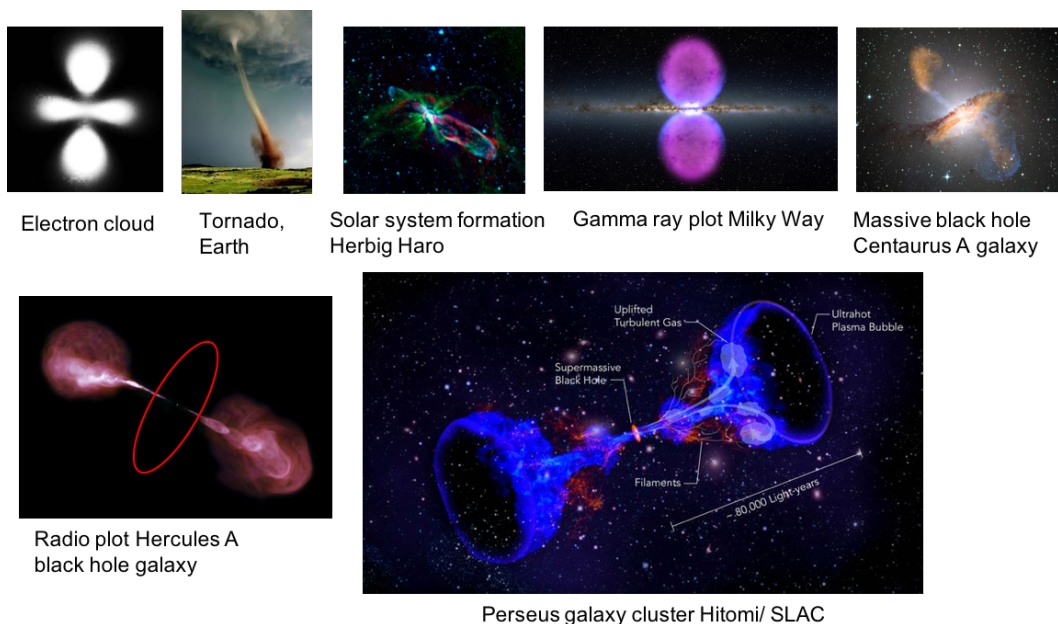
4. Consequences on the cosmic scale

It is only recent that astronomers developed an estimate of the age and dimensions of our universe and next observed it to *apparently* be expanding at an ever faster rate, as per interpretation of an observed redshift. In the previous chapters we already mentioned the dual continuum concept may lead to a radical different view.

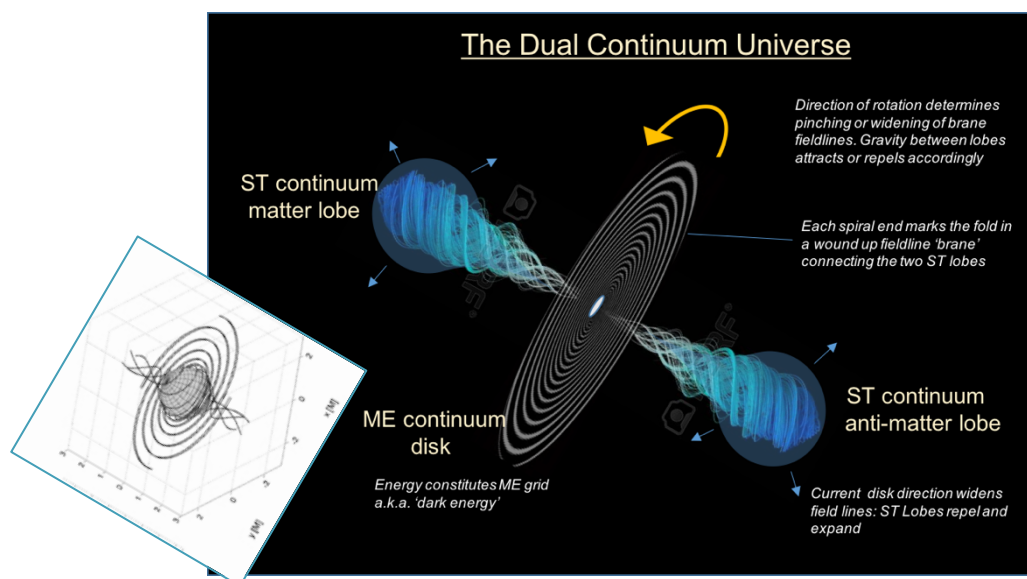
4.1 General structure of the dual continuum universe

General consensus is that our Big Bang universe would be more or less sphere-like. Although largely consistent with observations, a simple exploding sphere would offer no answer to the observed matter-anti matter a-symmetry. In contrast, we have the recurring 'Universal Fractal Format (UFF)' below representing singularities on all scales from atom to galaxy: It can be described as:

1. A rotating 'ME disk', home to particles that appear to have no matter / anti-matter preference and which separates:
2. Two ST sections ('lobes') of opposed matter connected by fabric (strings or 'field lines') which the disk in the middle would constantly wrap and unwrap: Examples of the UFF include:



It would appear better for cosmologists to let go of the default idea of an 'isolated sphere'. Certainly given the examples provided and its inherent attractive solution to the matter – antimatter dissymmetry one would presume the default shape below: It is also consistent with the 'Dark Flow' WMAP data, suggesting a CMB 'connective cord'.



The big-bang universe shape would constantly wind and unwind the field lines (rather strings) that connect the outer matter and anti-matter lobes, Allowing the lobes to constantly oscillate between minimum spatial singularity (maximum disk energy) and maximum spatial extension (minimum disk energy)

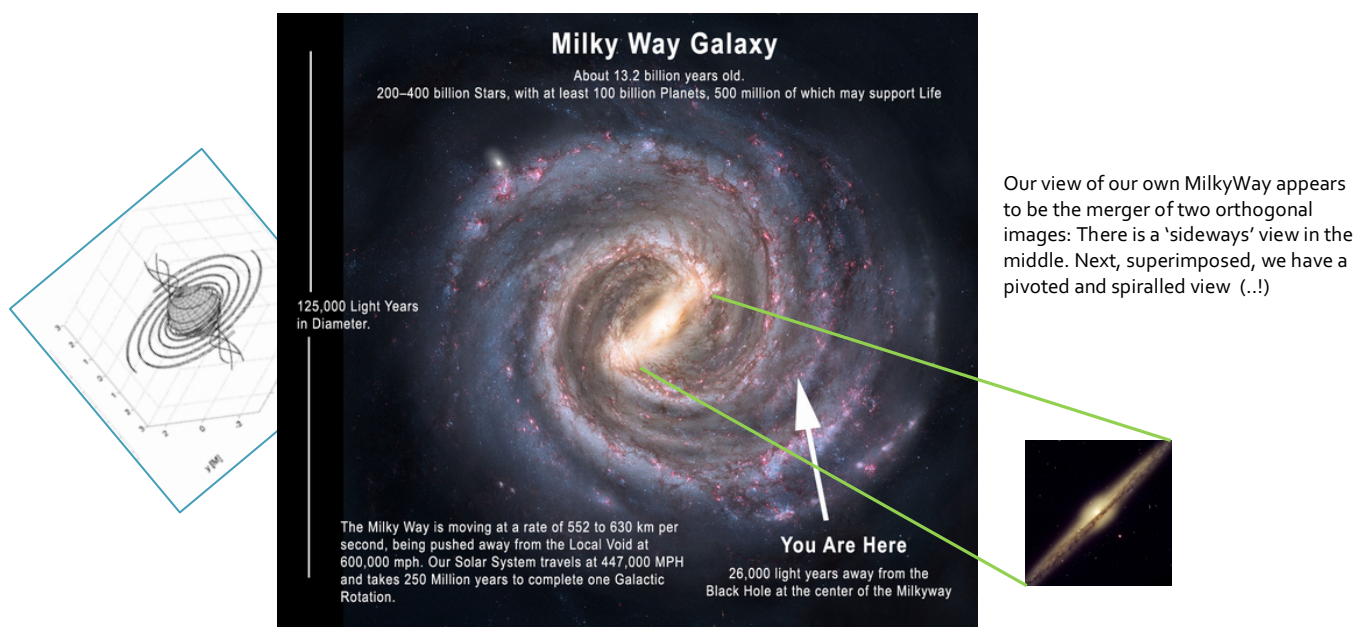
The strings suspended between the lobes would be the string-like 'ether' material from which galaxy singularities can next display the same oscillating behaviour only at a smaller level. These in turn deliver the string suspension with which minor black holes, stars(?) and next atoms can do the same at ever smaller scales.

4.2 The expanding universe; Dark Energy or a reversed arrow of time?

The observed red shift of the light of distant galaxies has been known for quite some time. Consensus interpretation is that this would point to an ever faster expanding Universe. The fundamentals of nature however suggest gravity can only repel, not attract. Moreover, the structure of our physical formulas are invariant to the arrow-of-time suggesting nature is open to a reversed arrow of time. Nevertheless, both these physical facts are discarded by human consensus thinking and collectively one prefers to invoke hypothetical 'dark energy' to explain 'repelling gravity' for which there is no evidence at all. Moreover, there is a clear indicator which can tell whether or not we are looking at our universe in reversed time; Such an opposed continuum view would invoke a spiralled outward view...

4.3 Our galaxy; Answers to dark energy and dark matter

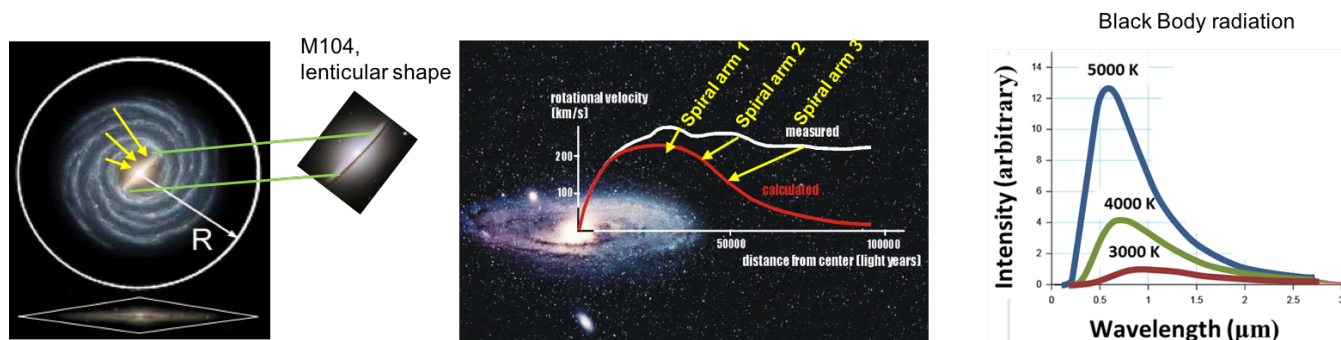
Earlier we showed via actual simulations how singularities bend field lines into an orthogonally spiralled plane in which not the 'spacetime' but the 'energymass' grid dominates. This allowed us to explain quantum leaps in atoms. If we look at this simulation below left, then we must admit the stunning similarities with our own galaxy. This has implications !



The fact that our own galaxy appears spiralled to us as ST observers, implies we are looking inside-out through a ME dominated structure. This can only mean we are either inside the central singularity (Sagittarius A) or inside a minor black hole of the galaxy. Taking a closer look at the Milky Way image above, it is the text book image of what we would expect to see after 'falling' into such a singularity: At the centre we have the 'time-frozen' *sideway* image of our galaxy, while we next see the same image rotated 90 degrees, and smeared out into a spiralled view. One may look at the singularity reconstruction to the left to verify how our spiralled vision is congruent with such a developing view.

Given we seem to have travelled little over two spiral arm rotations from the centre, our entering a singularity would have happened some 500 My ago. By no means did this transition 'impede life' on Earth because around this period the 'Cambrian Explosion' started, which is the period of biggest growth in variety of new (and land based) species on Earth. But regardless, our view outward is definitely inverted, which would include our view of the universe and its CMB. This implies that our arrow of time is indeed inverted relative to the universal arrow of time, which in turn means our observed redshift of furthest galaxies is actually a blue shift, which in turn means we have a contracting galaxy, which in turn means there is no 'repelling' gravity which in turn means there is no (need for) 'dark energy'. Case closed. Even better; an energy based grid of our spiral arms also next explains the 'dark matter' issue:

It is known for quite a while that the outer stars inside galaxy spiral arms are travelling much faster than they physically should, given Kepler's law of orbital motion. There are two ways cosmologists try to explain this phenomenon; either via hypothesising 'dark matter' inside galaxies that would yet hold the stars together. The other way of cheating is via 'Modified Newtonian Dynamics' (MOND). The dual continuum provides the third –and arguably correct- answer:



Since the spiral arms imply domination of the **energy grid** (ca. 5x more dominant than the spatial grid), this means we need to correct for the 'empty space' between the spiral arms since this is not an actual spatial grid. As such we must transpose the spiral arms back onto the centre of the universe in order to come to the shape the rest of the universe actually sees our galaxy. This correction of ENERGY as a spatial distance equals a correction of MATTER ($E=MC^2$) which is precisely the sought-after 'virtual DARK MATTER' which is therefor now accounted for !

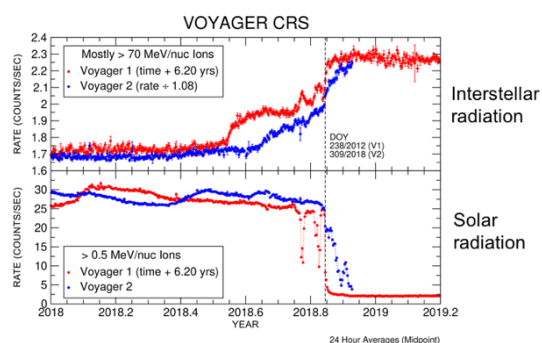
The result of the transposing correction of our spiral arms onto the centre, would make our universe look something like the lenticular shape of the Sombrero nebula (M104) above. Given that the distances of the arms are far less than the spiral picture would suggest, so would the actual rotation speeds of its stars be. To be precise: the stars' actual speed would be slower to the square root of relative radial change, which results in the correction picture in the middle where our measured speeds would perfectly match again with the calculated speed (in red).

Alternatively, one may see the number of windings as a galactic wave length. With the widening of the spiral arms so would the wavelength of the galaxy increase and so would the (virtual) rotation speed grow and next diminish over the years. From the first chapter we know that our dual speed expression is 'specific energy'. As such we may now look at the identical graph for wavelength and specific energy of black body radiation to the upper right. It seems the dual continuum allows us to also apply thermodynamics on all scales.

The Dual Continuum thus combines -in full the symmetry and on all scales- Classical Physics, Quantum Physics, Thermo Dynamics, Quantum Field Theory and Gravity.

4.4 Our Solar system

With the recent data of Voyagers 1 and 2 leaving the heliosphere we seem to get confirmation that indeed our interstellar space has a strong energy based grid since the rate of high energy particles exploded after passage (*see right*). This means we can interpret our heliosphere as being a large hollow but highly charged spherical conductor. From physics it is known that inside a perfect spherical conductor all outer electric potential cancels out, leaving only the very limited electric potential produced by our Sun itself. Apparently the heliosphere is not entirely spherical given some 'leakage' of interstellar radiation, but it comes close.



Over all, it would appear our Sun itself is a kind of energy singularity with a double Schwarzschild radius, with the photosphere being the inner and the heliosphere the outer one. This explains why our Sun is almost perfectly spherical, but more importantly; this explains why we experience the smallest unit of charge to be so much larger than the smallest unit of spatial distance. In all, the dual continuum concept calls for a complete rethinking of physics on all scales as we appear to live in a Matryoshka universe, with similar singularity patterns recurring on encapsulated scales. It opens up a new world of phenomenal new technologies and possibilities. Moreover, once we get over the 'first scare' of being inside a 'singularity', we need to realise we are actually doing fairly well as far as conditions for life are concerned. Moreover, given the dominance of an energy based grid outside our solar system, it may be quite doable to harvest this energy and cross the distance to our nearest stars much quicker and easier than we thought...