

Quantum Geometry conserves Baryon symmetry - The matter - antimatter Universe

Baryon Asymmetry*

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Abstract

The Universe that we live in is a universe of matter, even though we know that there must be just as much antimatter around that will balance the matter it appears that the antimatter is no where to be found. We know this to be simply true, as a matter-antimatter universe would vanish in one annihilation event, which is what apparently happened very, very soon after the big bang. We are here by grace of a very small imbalance in favor of matter, one particle of matter surviving for every one billion matter-antimatter pairs.

Other than the mirror matter-antimatter universe hypothesis, or matter-antimatter bubble universe, most research in baryon asymmetry, baryogenesis, is directed at finding a good mechanism for symmetry breaking, following the three conditions set by Sakharov in 1967 [1]. To date there are no viable theories, and the matter-antimatter imbalance remains as one of the great unsolved mysteries in physics. However, this then implies that nature has created a universe that is so out of balance that the dance partner is nowhere to be found.

Quantum Geometry is a new proposal to allow baryon symmetry to be conserved, and a universe with 50% matter and 50% antimatter, to actually exist, everywhere. At the lowest level of existence, that of the fundamental particles, both quarks and antiquarks can be used to construct the composite particles of the second level, the subatomic particles, without annihilation. In the heart of the sub-atomic particles, the proton and neutron, the geometry of the gluon equilibrium allows these particles to contain quarks and antiquarks, the proton holding four quarks and one antiquark, the pentaquark [2], and the neutron being made up of three quark-antiquark pairs. These sub-atomic particles then interact further as particles of matter, avoiding annihilation in the world of matter.

Then, Quantum Geometry is used to propose a composite electron. This sub-atomic particle would be made of four antiquarks and one quark, an antimatter pentaquark. The atom then becomes the third level building block of matter, made of protons with a baryon number of +1, neutrons with a baryon number of 0, rather than also +1, and a composite electron with a baryon number of -1, rather than being a point-particle fermion. This allows the universe we see to have a baryon number of 0, to have baryon symmetry, without having to search for the antimatter or to consider that it has all disappeared in an explosion of light.

Keywords: *Quantum geometry; Relativity theory; Equilibrium; Absolute time*

Introduction

Every atom contains an equal amount of matter and antimatter, held in equilibrium by a powerful geometry that is fully explained in this new theory of Quantum Geometry that will take us beyond relativity theory. Our universe is a balanced geometric matter-antimatter universe, at all levels, each balanced through a zero-point that is anchored in absolute time.

Baryon Symmetry

At the beginning of time and space, the beginning of the universe (the big bang) there was an equal amount of matter and antimatter, of quarks and antiquarks. These were all fundamental particles, and at the creation of fundamental particles there will always be an antimatter particle created for every matter particle. This theory of matter - antimatter production was first discovered (inadvertently) in 1928 by Paul Dirac, at the time science was first explaining the sub-atomic particles that make up the atom (protons, neutrons, and electrons) and long before the proposal and discovery of the fundamental particles that are making up these sub-atomic particles.

The Dirac equation was introduced as a means to integrate quantum mechanics and special relativity, and Dirac himself realized that the equation could be solved in two different ways, one giving a positive result and the other a negative result. This negative result would give the negatively charged electron a positive charge, the antithesis of the electron became the positron (positive electron). Paving the way for an antiproton and an antineutron antimatter.

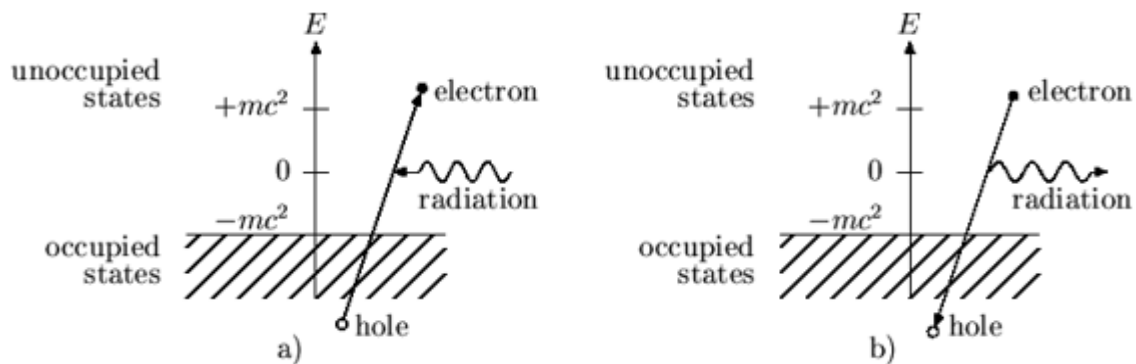


FIG.1. Dirac Hole Theory - Image Wikipedia a) electron/positron pair production b) annihilation.

Dirac realized that the $+mc^2$ electron had a positive energy and shouldn't be able to decay into a negative $-mc^2$ state, figure 1.1. He went on to explain this using what has become known as the hole theory. He proposed that all of the negative states are already occupied, preventing the electron from decaying into a negative state, however, should there be a hole, an empty negative space in this sea of occupied states, then a photon could knock the electron into this negative space. Dirac thought that this positive electron would be a proton, but several years later the first antimatter particle, the positron, was discovered that fitted the hole perfectly. Matter and antimatter particles would annihilate, producing photon radiation, and could also be created, as a result of photon radiation, but only in these matter - antimatter pairs. The universe will have perfect symmetry.

The sub-atomic particles were known as Baryons (the Greek word for heavy) as they were much heavier than the other elementary particles being discovered at that time. Much later it was discovered that the proton and the neutron were made up of three smaller particles which would be called quarks. So, a baryon made of three quarks has a baryon number of +1, mesons made of one quark and one antiquark have a baryon number of 0, and antibaryons made of three antiquarks, have a baryon number of -1. Because a baryon is made of three quarks, the individual quarks have a baryon number of $+\frac{1}{3}$, or $-\frac{1}{3}$ for an antiquark. They can be added to create whole baryon numbers:

$$B = \frac{1}{3} (n_q - n_{\bar{q}})$$

For example, the tri-quark proton is then $B = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$. Newly discovered exotic hadrons like pentaquarks made of four quarks and one antiquark $B = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} - \frac{1}{3} = 1$, and tetraquarks made of two quarks and two antiquarks $B = \frac{1}{3} + \frac{1}{3} - \frac{1}{3} - \frac{1}{3} = 0$, are also classified as baryons and mesons depending on their baryon number.

Baryon symmetry is said to have existed at the very beginning of the universe (before one millionth of a second after the bang), after which matter-antimatter annihilations removed all of the antimatter, leaving only matter and an immense number of newly formed photons, creating baryon asymmetry, also known as baryogenesis or baryosynthesis. This is currently the best proposal to explain our universe of matter (with no antimatter) although there are several other theories.

Baryon Asymmetry - Existing proposals

Our universe, the universe in which live, is clearly made up of mostly matter, only particles with a baryon number of +1, and no -1 particles, giving baryon asymmetry. If the universe was in a condition of balanced creation, it would have a baryon number of 0, that is an equal number of matter particles to antimatter particles, baryon symmetry, or $B = 1 - 1 = 0$. This could have come about through a massive matter - antimatter annihilation in the very early stage of the universe, although this would have meant a slight imbalance of matter and antimatter in favour of matter, and an annihilation of more than a billion matter - antimatter pairs for each matter particle that now makes up the universe. Considering that nature is always seeking balance in everything it does, any system that moves away from this balance quickly becomes unstable, and a universe that owes its existence to such a serious disbalance as this is very hard to accept. Despite this obvious problem, this is still by far the most popular explanation for baryon asymmetry, and we are using nothing more than that age old adage that we are here, and this is what we see so it must be right, if it was wrong, we would cease to exist.

A second explanation is that of a mirror anti-universe, where all of the matter produced at the beginning of the universe expanded out in one direction and all of the antimatter in the opposite direction creating two evolutionary cones, one of matter and one of antimatter.

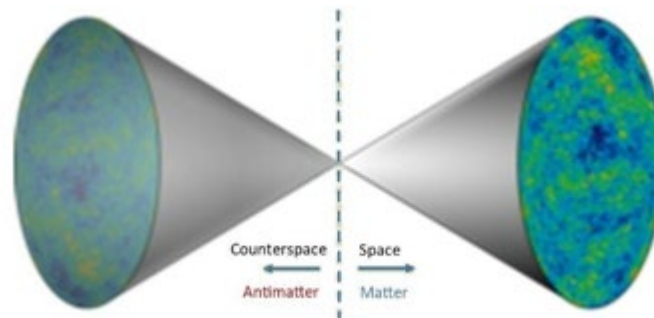


FIG.2. Mirror Universe. Image Wikipedia.

This explanation is balancing our universe of matter against a second universe of antimatter, but we could also extend this into a third option where we don't necessarily need this second complete universe. The third explanation is that our visible universe contains regions of matter and regions of antimatter that are isolated from each other, such as galaxies and anti-galaxies, quite similar to the diagram above. Or even solar systems and anti-solar systems. This would satisfy nature's desire for balance and give our universe a baryon number of 0.

There are also a small number of purely theoretical (hypothetical) symmetry breaking propositions based on symmetry violations, at the quantum level, including dark matter baryogenesis, that would have allowed our universe to evolve from a baryon symmetric condition to a baryon asymmetry condition over long periods of time. But once again we are seeking to confirm an extremely out of balance universe where almost all antimatter has been removed. Such an intensely out of balance system actually has little chance of becoming stable, even if this is the only explanation we can find to justify baryon asymmetry. After all, as we already know, "to every action, there is always opposed an equal reaction" that would begin to immediately bring our universe back in to balance, back into symmetry.

Lastly, we are proposing in this paper a wholly new theory, based on quantum geometry, that our universe has not broken baryon symmetry and is still fully symmetric, all the way down to the level of the fundamental particles,

the quark and the antiquark, without annihilation. If we are able, in any way possible to find a solution to baryon asymmetry, that would ensure a balanced system, then surely this would be preferable to highly complex solutions that seek to keep our universe in an extremely one-sided imbalance.

Baryon Symmetry - Quantum Geometry Theory

This new theory contains two components, firstly a cosmic isolation of matter and antimatter, as proposed in the third option above, of regional imbalances in space, at galaxy and solar system level. Our own Sun, and most other stars, are proposed to be a membrane with matter particles visible on the outside and antimatter particles on the inside, the observable surface of the sun being a matter- antimatter reaction (annihilation) zone, visibly giving off vast amounts of light and heat. This cosmic isolation of matter and antimatter will be covered in a separate paper.

The second component allows baryon symmetry to be applied at the fundamental particle level, at the very beginning of the universe, and most importantly, still present today. One level above that of the fundamental particles is the baryonic level, where protons and neutrons are assembled by the rapidly expanding universe out of quarks and antiquarks. At this baryonic level it is clear that a proton and antiproton will indeed annihilate, as well as a neutron and antineutron, and an electron and positron (positive electron). This is where physics is still today and came about through the matter-antimatter symmetry being discovered several decades before the establishment of quarks and antiquarks as being the building blocks of the baryons.

At a cosmic level we can keep matter and antimatter apart using the vast regions of space, however, at the biological level, the region of life, where we live there would clearly be an annihilation between a person and an anti-person, or a tree and an antimatter tree. So, from the planetary level to the level of biological life, and on, down to the level of the atoms and sub-atomic particles, the baryons, we have a clear asymmetry, resulting from immediate matter-antimatter annihilation.

However, we are proposing that at the very lowest level, that of the fundamental particles, matter- antimatter symmetry is maintained, and that the quarks and antiquarks are incorporated into baryonic particles, the protons, and neutrons in a 100% balanced way. They are made of equal amounts of quarks and antiquarks, matter and antimatter, just as the Dirac equation shows us. As the building blocks of all atoms, they are also the building blocks of all of what we call matter, and all of life, including us. All atoms in the universe are made of 50% matter, quarks, and 50% antimatter, antiquarks, giving our universe a natural balance, and a baryon number of 0, the symmetry of matter and antimatter that we have always expected to see.

The fundamental particles - Quantum Geometry

In order for the universe to be in equilibrium it will need to balance the matter that we see, and can feel, with an equal, and opposite (charge), amount of antimatter. That will be 50% matter and 50% antimatter, exactly equal amounts of each. This is now proven with the Dirac equation, that shows a negative space, or counterspace, version of our visible space, and that for every particle of matter created in the universe there is always a particle of antimatter created. We are now going to show where we can find that antimatter, and that it is always equal to the amount of matter, everywhere.

All of the matter in our universe is built up of atoms, they are the building blocks of everything, atoms make up all of the molecules we find in chemistry, and these molecules make up everything else. Atoms are, in turn, made up of the three sub-atomic particles, the proton, neutron, and electron. These sub-atomic particles have been intensively researched over the last one hundred years in order to get to know more about how the universe is made. In fact, we have now discovered that the proton and the neutron are made up of particles even more fundamental, the quarks, reaching right to the bottom of creation.

In this proposal we will be showing that at the lowest level of creation, that of the fundamental particles we can bring the universe into balance. At this level there are four basic and indivisible particles, the quark, antiquark, photon, and gluon (you can read further, in the book Quantum Geometry, why we consider these particles to be the lowest level and to be truly undividable). These four particles were the first to appear out of the primordial sea of fire at the beginning of the universe and make up all of the higher order particles. We have not included the electron at this fundamental level as we believe the electron will ultimately be proven to be a composite sub-atomic particle at the same level as the other baryonic particles. The characteristics of the electron already show that it should be a composite particle and we will discuss this further later in this proposal.

Geometry of symmetry

First, we need to look at the geometry of symmetry that allows us to consider the universe as the harmonic balance of quarks and antiquarks, matter and antimatter. This geometry is the key to this proposal, by creating the right geometry we are able to either keep matter and antimatter particles from annihilating, or allow them to interact, merge, in the necessary process. We know that allowing matter particles to meet antimatter particles in our experiments, or uncontrolled in space, will always result in annihilation, however nature, the universe, has been one step ahead of us by either finding special conditions to keep these particles apart, avoiding annihilation, or creating special conditions where they will interact, merge, or annihilate in a controlled way.

The Torus

The first geometric form we need to look at is the torus. This form is an actively dynamic symmetry of in and out, a zero dimension that has become manifest in the three dimensions of space. The torus can be as big as the universe, our universe is in fact most likely in the form of the torus, as big as a galaxy, or as small as a photon or quark, the primordial fundamental particles, and everything in between. It is torus's all the way down.

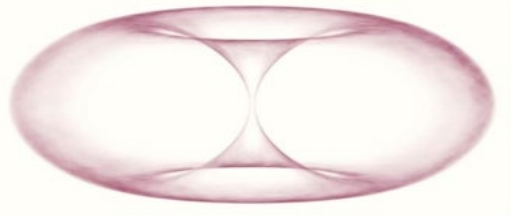


FIG.2.1. The Universal torus

What you immediately see with the torus is a double vortex cone, one vortex facing upwards and one facing downwards. The flow of energy within the upper vortex will move upwards and outwards, eventually traveling over the outside of the torus to be reabsorbed into the lower vortex to be recycled again by the torus. Energy can also flow outwards from the lower vortex then around the outside to re-enter via the upper vortex. This double vortex should then be recognizable as the Mirror Universe shown in figure 1.1.

In the torus Universe we automatically get a matter universe underneath in the torus and an antimatter universe above, or vice versa, depending on which way you are looking at it, space and counterspace. Photons of light will be able to travel the full circuit, in both directions, being radiated and absorbed over and over, however, quarks and all matter particles will circulate within the space vortex, and antiquarks, including all antimatter particles circulate within the counterspace vortex.



FIG.2.2. Galactic torus

At the level of the Galactic torus, figure 2.2, the stars of the galaxy spiral outwards to fill the torus in a disc like structure. Particles of intensely cold and dark matter moving much more slowly than the photons, can be seen “hanging” in a cloud of energy around the outside of the torus.

Finally, we can look at the Solar torus, figure 2.3, the torus surrounding our own star, the Sun. Here you can see a double light cone of photons that travel in and out, in both directions around the outside of the torus. The lower vortex, light cone, being antimatter, counterspace, and the upper vortex matter, space. Our own Solar System of planets, moons, and other matter objects, including the earth, is circulating within the upper vortex of matter. There is most likely to be a second solar system of antimatter, counterspace, planets in the lower vortex, although this has never been proven, it sounds quite possible.

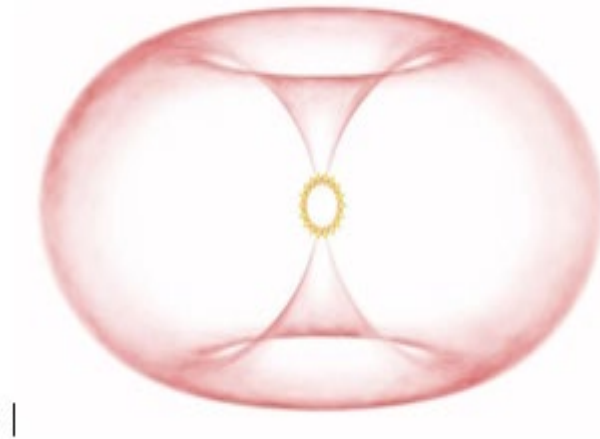


FIG.2.3. Solar torus - The Sun

What is important to recognize is that the Sun becomes a transition zone between matter and antimatter, just like the mirror universe, the Sun is also a mirror between space and counterspace. Even though the photons of light can circulate in both directions around the complete torus, all particles of matter (all composite, non-fundamental particles of matter) will circulate within the upper vortex of space, and particles of antimatter within the lower vortex. The surface of the sun itself is the transition zone between upper and lower, the intensely hot furnace where matter and antimatter can interact.

The torus is not just the energy field around any physical object, from the Universe itself, all the way down to the field around each individual quark or antiquark, it is also the field within which that physical object exists and operates. Each field then interacts with other fields around it and becomes part of the larger field associated with that object, such as the quark field, photon (electromagnetic) field, all the way up to the Universal field.

Geometry of the Fundamental particles

Here we will look at the geometry that allows us to work with matter and antimatter at the level of the atom, the sub-atomic particles, and the fundamental particles. This is the geometry that will allow us to understand how the universe can include an equal amount of matter and antimatter, 50/50, in every atom, throughout the universe, whether it is in space or counterspace.

The torus allows us to have matter on one side of a space - counterspace membrane and antimatter on the other side, a field above and a field below. These two fundamental fields are the quark field and the antiquark field, the seas above and the seas below, as a reflection of the Universal torus at the level of the fundamental particles, the absolute bottom of creation. The point where these two fields meet, at the point where the upper vortex meets the lower vortex, is the zero point. Everything above the zero-point, space, matter is the $+mc^2$ side, and everything below the zero point, counterspace, antimatter, is the $-mc^2$ side.

Floating in the quark field, the seas above, are point-like vortexes of field energy called quarks, and these take on a special double vortex form called the octahedron, figure 2.4. The vortexes meet at the base, not at the points. Floating in the antiquark field, the seas below, are the point-like vortexes of field energy called the antiquarks. Here the blue colour represents a matter particle and the red an antimatter particle, the colours do not refer to colour charge.

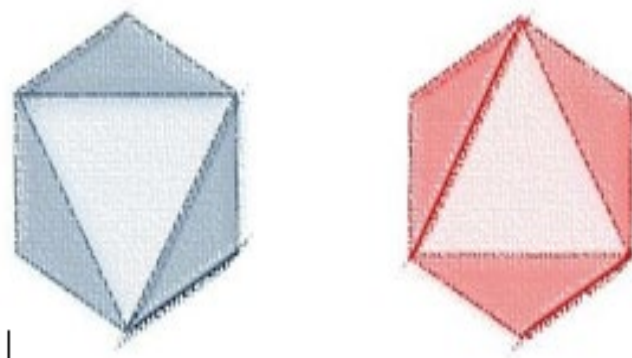


FIG.2.4. The Quark and the Antiquark

Quarks travelling the seas above, close to the zero-point membrane, the matrix, will cause a single vortex shaped ripple in the seas below, this tornado of energy in the antiquark field is called the gluon. Likewise, an antiquark travelling the seas below close to the zero-point membrane, will create a single vortex ripple in the quark field above, called the photon. The photon and the gluon are two halves of the same particle, with one-half appearing above the zero-point membrane radiating zero- point energy into the quark field, the photon, and one-half below the membrane sucking energy from the quark field, the gluon.

The photon, as a point-like radiating energy, has the form of a tetrahedron. The gluon, as a point-like attractive or sucking energy has the form of a tetrahedron standing on its point.

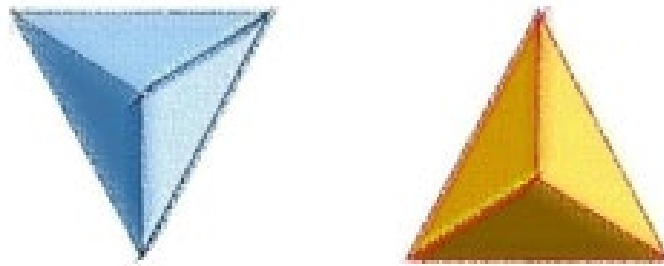


FIG. 2.4 - The Gluon & the Photon

Now we have all of the fundamental particles we need to build a universe . . . everything. The quark and the antiquark are the point particles of the matter field and antimatter field. The photon is the point-like particle and force carrier of the radiating electric field, and the gluon is the point-like particle and force carrier of the attracting magnetic field.

In the following diagram you can see, more pictorially, how these particles appear as spiraling vortexes in the wave-like seas of matter and antimatter, space and counterspace. The zero-point membrane is the transition point between the two fields, much like the surface of the sun, however the quarks and antiquarks respect this boundary, always being repelled away by the ripples in the membrane represented by the photons and gluons, and not annihilating. You can see how the gluon creates a negative vortex, a hole, in the membrane that always draws energy and matter towards it, creating a suctional force on the matter side of the membrane. The photon creates a positive, or radiating vortex, a hill, in the membrane that radiates energy into the matter side of the membrane. Because we live on the matter side, space, we tend to view this process biased to the world of matter. Anti-people living on the other side of the membrane will describe it from their own antimatter point of view.

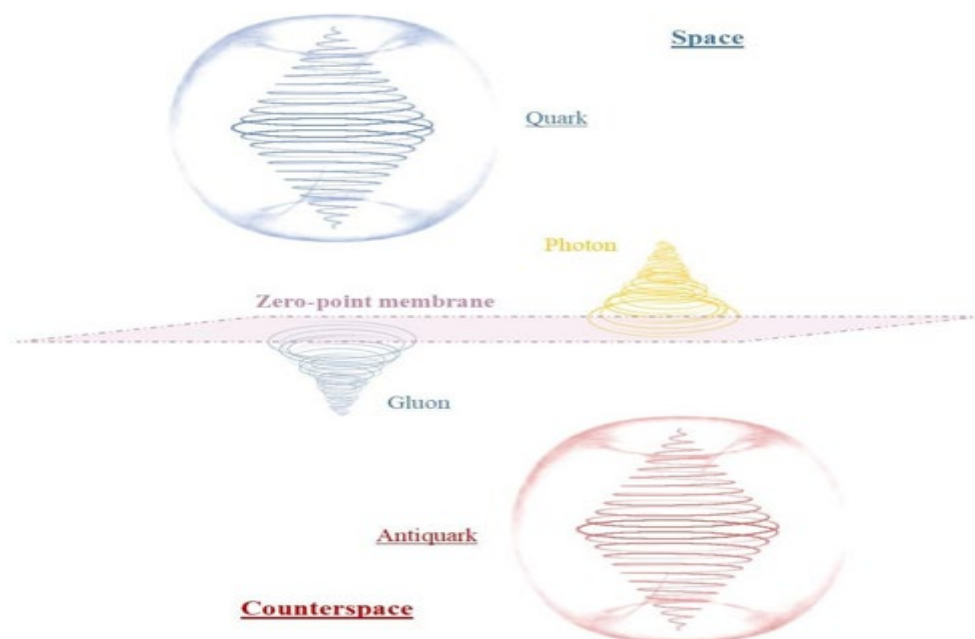


FIG. 2.5 - The zero-point matrix

The zero-point membrane is also known as the matrix, or the zero-point field, and it is the vast sea of boundary energy that is maintained at this threshold by the activity of the quarks and antiquarks (shown in this diagram as single entities for simplicity) interacting with each other via the energy/force carriers of the photons and gluons. These photons can travel far out into the quark fields when given enough force, carrying this small package of energy out to wherever it is needed, and the gluons travel the quark sea back towards the membrane, carrying energy back to the source, when it is not needed, both particles traveling as waves within the fields.

The quarks and antiquarks never cross the boundary as single point-particles, they will always be carried to the other side as part of a composite sub-atomic particle. Understanding how quarks never really appear as single entities but always as groups of three quarks (mostly), or a quark / antiquark pair, is the study of QCD (Quantum Chromodynamics) and colour charge. In fact, high energy experiments have also recently discovered a double quark / antiquark pair, called tetraquark, and a pentaquark with four quarks and one antiquark. Finding the pentaquark has interesting ramifications for this paper. How Quantum Geometry deals with QCD and colour charge will be presented in a future paper.

We can now introduce the geometry of these composite particles, as we will need them to construct all of the atoms.

Geometry of the sub-atomic particles

The important geometry of the atom occurs at the level of the sub-atomic particles, and we will need three of them to create a harmonically resonating threefold particle of matter called an atom, the proton, the neutron, and the electron. Once we have created these three composite particles, we can create all 118 atoms of the Periodic table of Elements and go on to create all of the chemistry of the mineral, plant, animal, and human realms, we can create all of life. Using Quantum Geometry to assemble these sub-atomic particles allows us to follow a blueprint, rather than only relying on forces to pull the components together.

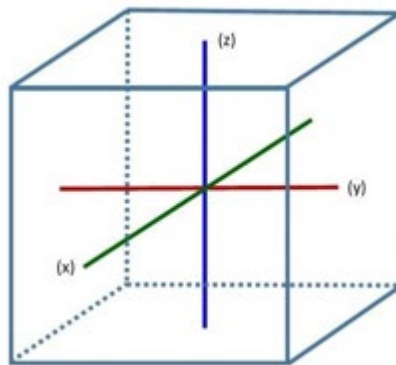


FIG. 2.6 - Cube - The three dimensions

For the basic geometry of these composite particles, we need the three-dimensional cube, with its six faces, eight corners, and twelve edges. Directly related to the cube are the three geometric forms of the octahedron, cuboctahedron and star-tetrahedron that we will be using. We have already seen the quark and antiquark depicted as the octahedron, with six corners, eight faces and twelve sides it is the dual of the cube.

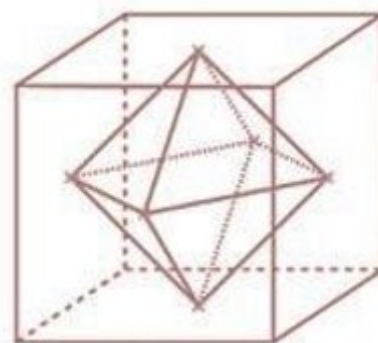


FIG. 2.7 - Cube dual, the octahedron

The next form we will be using is by far the most important and the most powerful of these three forms, the cuboctahedron. The cuboctahedron appears as a cube with each of its eight corners removed, leaving eight triangular

corners connecting six square faces. However, we are going to use a special version of this form called the octahemioctahedron.

Each of the eight triangular corners of the octahemioctahedron is actually a tetrahedron pointing inwards to the centre, leaving six inverted pyramid-shaped faces, also reaching all the way to the centre point. This form is at the middle of each of three sub-atomic particles. It is made of eight gluons, in their tetrahedral vortex shape, all facing inwards to the central point, creating an immense suctional force, known as the strong force. This is the geometry that binds the quarks into the heart of the sub-atomic particles, the heart of Quantum Geometry.



FIG. 2.8 – **Octahemioctahedron**

This form is also a good candidate for finally discovering the glueball, a proposed particle containing no quarks, only gluons. With a tetrahedral vortex form they are most likely to create this eight-gluon symmetry, with or without the quarks. A good name would be the gluon equilibrium (from the vector equilibrium name often given to the cuboctahedron) rather than a glueball, the gluons are already having enough to put up with, with their unfortunate name.

The last of our three forms is the star-tetrahedron. This is the dual of the octahemioctahedron, in that the eight inward-pointing tetrahedrons are replaced with eight outward pointing tetrahedrons, in a beautiful radiating star of light, the photon. This becomes the outer form of the electron that allows the creation of an impenetrable composite particle.

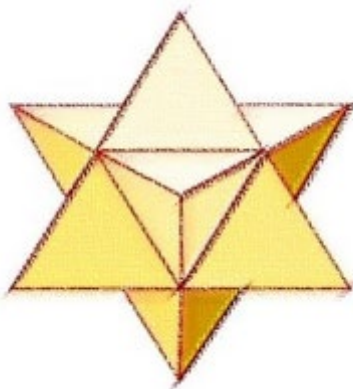


FIG. 2.8 - **Star-tetrahedron**

Now we have all of the geometric forms that we need to create the composite sub-atomic particles that make up the atom.

The Sub-atomic particles

Our task now is to create the atom with equal amounts of matter and antimatter in order to maintain this fundamental universal parity, and without annihilation.

To make the hydrogen atom we only need one proton (+1) and one electron (-1), but let's look at making the neutron as well, as this will be needed for all the atoms that come after hydrogen. The neutron is also the particle that will

get its neutral (0) charge from having an equal amount of matter and antimatter. Using the equation for Baryon number:

$$B = \frac{1}{3}(n_q - n_{\bar{q}})$$

The baryons - Proton and neutron

A baryon is any sub-atomic particle with an odd number of quarks (mostly 3), giving a baryon number of +1, or an odd number of antiquarks, giving a baryon number of -1. A particle with an even number of quarks and antiquarks has a baryon number of 0 and is then called a meson. Baryons and mesons are then both categorized as hadrons. Baryons are also fermions in that they have half-odd-integer spin, $\frac{1}{2}$, $\frac{3}{2}$.

In Quantum Geometry we are introducing the gluon equilibrium, the octahemiocuboctahedron, to the heart of all three sub-atomic particles. This geometric form has eight gluon vortexes facing inwards and meeting at the center-point, giving what is known as the strong force that binds the quarks into the composite particle. What is extra special about this form is that it then has six inverse pyramid-shaped faces that can each receive an octahedron shaped quark, or antiquark without these touching each other. The perfect energy crystal for making composite particles.

For each gluon equilibrium there is room for 6 quarks, each with a $\frac{1}{3}$ charge and $\frac{1}{3}$ baryon number. This form not only gives a standard geometric structure at the heart of each composite particle but also shows how nature balances forces at this sub-atomic level. It will enable a much more simplified quantization and notation, as well as giving a much more simple description of color charge. This paper presents this new form of particle physics for the first time; therefore, it may take some time for the current 3 quark definition of the baryons to translate into this easier and more understandable system.

At the sub-atomic level, these particles appear in our world of matter as particles of matter and react with other particles as if they are made up of matter. However, at the level of the quarks, the fundamental level, they are made of both quarks and antiquarks, the pure harmonic balance of matter and antimatter. The antimatter versions of the sub-atomic particles do not appear in our world of matter but are the constituents of the antimatter world, countering space.

We have now arrived at the point in particle research where a much deeper understanding of the proton and the neutron, and eventually the electron, is necessary in order to go further than the current model which always shows just 3 quarks in each particle, the baryons. This has also restricted quantum physics to calculating all characteristics and interactions using only this model. However, it is quite possible to have up to 6 primary (valence) quarks in these sub-atomic particles, including antiquarks. That the electron also becomes a composite particle made up of quarks and antiquarks, rather than an elementary point-particle of unknown origin, can not be ruled out. Each sub-atomic particle will also have a torus-shaped energy field that may contain additional gluons and quarks, real and virtual, in a supporting role.

New research is already showing that these particles contain much more than just the standard 3 quarks, including many quark-antiquark pairs. In this modern view of the proton, figure 3.1, from the German Electron Synchrotron DESY, they show the gluons (yellow) and the quarks (red, green, and blue) in a chaotic tangle of real and virtual quark-antiquark pairs around the central persistent quarks [3,4].

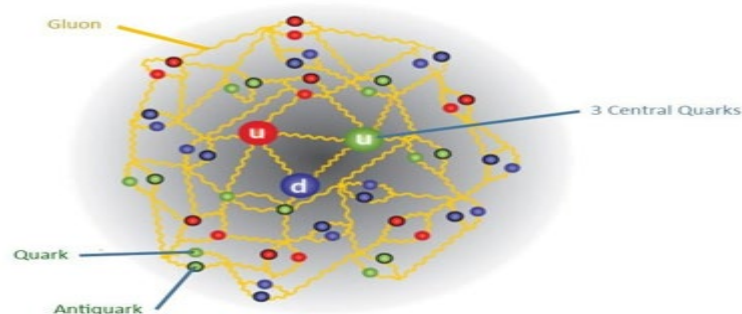


Fig. 3.1 - Proton, quark-gluon tangle - Image DESY

In reality the particle accelerator experiments, when viewed in more detail, show a much busier picture of the sub-atomic particles than the 3-quark model. The 3 primary quarks reflect an averaging of millions of

results into a standard model that has much more going on than just these central quarks. Although the DESY proposal shows this as more of a chaotic tangle of particles it is much more likely to have a more consistent, geometric, structure.

The Neutron

In the new Quantum Geometry model the neutron (0) is the most perfect of the three sub-atomic particles, it represents nature in its most balanced and structured form and shows why this particle is always used to hold balance in the atom between the other two particles, the proton, and the electron, positive and negative. The neutron is made up of 3 quarks and 3 antiquarks, 6 in total, in perfect balance. In fact, the gluon equilibrium at the heart of the neutron has all 6 quark receptacles filled, with 3 quark-antiquark pairs.

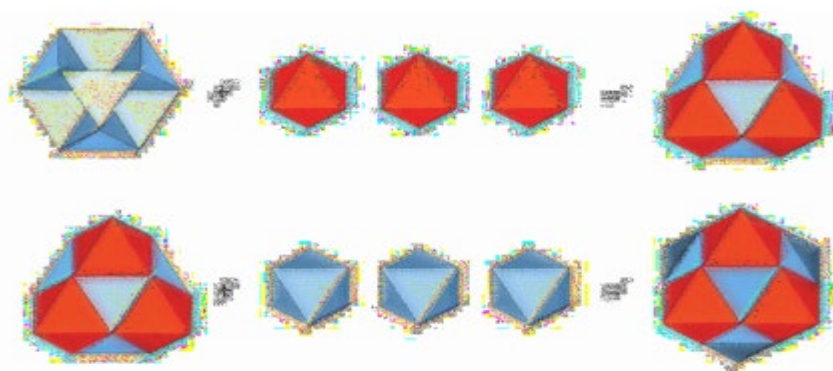
If we do the baryon number calculation, we get:

$$B = \frac{1}{3} (3 - 3) = 0.$$

Which gives us a meson, rather than a baryon, however this baryon number of 0 tells us that the old model is focused on a 3-quark theory (in particle collision experiments the 3 antiquarks are annihilated instantly by virtual or real quarks in the neutron energy field, leaving the standard 3 quark baryon). However, we do need to consider that this new model works differently, and we need to look at charge e , rather than baryon number, giving each quark a $\frac{1}{3}$ charge we get:

$$\text{Charge } e = \frac{1}{3} (3 - 3) = 0.$$

So, in effect both the baryon number and the charge tell us that this is a neutral particle, which is exactly what we want. So, we can put together our neutron in two steps. First, we take the gluon equilibrium and add in three antiquarks, then we add to this the three quarks. The dark blue quarks are only just visible behind the light blue gluons.



This is the neutron, with a center made of 8 gluons, and in the six inverse-pyramid receptacles three quarks and 3 antiquarks. The final form is an octahedron again just like the quarks. We can give the neutron a neutral violet colour, representing its 3 red antiquarks and 3 blue quarks, as well as a torus-shaped energy field.



FIG. 3.2 - The neutron (0)

The neutron in this form always has a N-S polarity created by the quarks and antiquarks, which means that if we flip the neutron over it will also flip the polarity to S-N. Allowing it to have an internal structure that may go on to better explain some of the characteristics of the neutron such as magnetic moment, electric dipole moment, and even contribute to better understanding spin. By bringing six quark energy fields together in one composite particle the neutron is a large second level generation of particles that are creating matter (mass) out of the vacuum, zero- point field (nothing).

The Proton

The second composite particle we need to construct in order to make up the atom is the proton (+1). This sub-atomic particle carries the positive charge of the nucleus and achieves this by being made of four quarks and one antiquark.

Because this is an odd number of quarks, we can still classify this as a baryon, and this particle, called the pentaquark, has already been discovered in experiments [2]. If we look at the baryon number, we find:

$$B = \frac{1}{3} (4 - 1) = +1.$$

So, this is clearly a baryon and with each quark having a $\frac{1}{3}$ charge we will also find: Charge $e = \frac{1}{3} (4 - 1) = +1$. This model of the proton gives us the same numbers as the 3-quark model (in particle collision experiments the antiquark and one quark annihilate instantly, leaving the standard 3 quark baryon)

The gluon equilibrium at the heart of the proton will now have 5 receptacles filled, four with quarks and one with an antiquark. The sixth receptacle remains empty, although this sixth gap also allows the proton to become a truly dynamic particle in the nucleus. In its normal state the sixth receptacle is empty but can take on an extra quark making the proton extra positive or taking on an extra antiquark making the proton less positive. These extra quarks or antiquarks, appear as real or virtual particles from the proton torus field whenever needed.

Once again, we take the gluon equilibrium and this time add in four quarks, then we add to this one antiquark. The red quark is only just visible behind the light blue gluons at the bottom and the back right receptacle is empty.

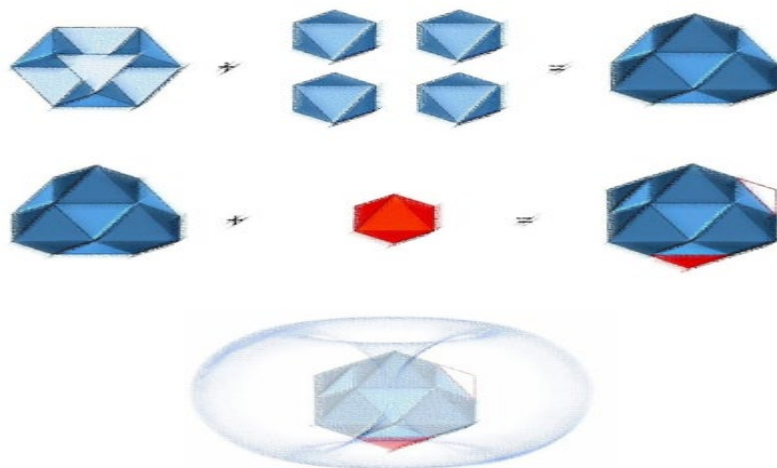


FIG. 3.3 - The Proton (+1)

The final form is an octahedron again. We can give the proton a blue colour, representing its domination by blue quarks, as a particle of matter (+1). It has a torus-shaped energy field. The proton in this form also has a N-S polarity created by the quarks and the antiquark, which means that if we flip the neutron over it will also flip the polarity to S-N. Allowing it to also have this composite internal structure may go on to better explain some of the characteristics of the proton better, such as how it interacts with the neutron in the nucleus, or also its spin for example.

The fact that one receptacle is often empty may explain why on average the proton has slightly less mass than the neutron. However, by bringing five quark energy fields together in one composite particle the proton is also a large second level generation of particles that are creating matter (mass) out of the vacuum, zero-point field (nothing).

The Nucleus

Together the proton and the neutron make up the nucleus of the atom. With this new model giving both the proton and the neutron a N-S polarity, due to the quarks and antiquarks making them up, they are able to nestle together much more easily in the nucleus, without repelling each other.

Colour Charge

The three-fold nature of the sub-atomic particles has necessitated the concept of colour charge in order to explain the balancing of the charges of three quarks in the proton and neutron. However, a bonus attribute of the proposed Quantum Geometry theory is the dramatic simplification of the mathematically based colour charge with a geometric explanation.

At the heart of each sub-atomic particle is the gluon equilibrium (octahemiocuboctahedron), that we will show as a cube here for simplification. This allows six quarks in each sub-atomic particle in stead of only three, one for each side of the cube, held together by eight gluons, one for each corner of the cube.

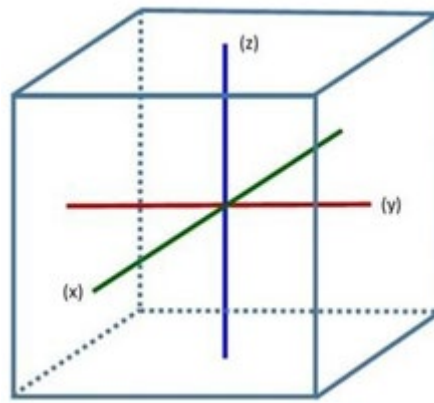


FIG 3.4 - Colour charge Cube

As you can see in figure 3.4, we now have the three axes of the cube x, y, z shown as green, red, and blue, corresponding with the six faces of the cube. For each axis there are two faces, a positive (matter) and a negative (antimatter) face, so we now have six options: red and anti-red green and anti-green blue and antiblue.

These are the six possibilities of colour charge involved in Quantum Chromodynamics, and they are all fitting together in one geometry. Rather than colour charge relating to an immensely complex formula that governs the quarks in a sub-atomic particle, the colour charge actually relates to the geometry of the cube. Quarks, and antiquarks will only be able to join the particle if there is an empty slot, and this slot will already have an assigned colour. For example, a quark with a red charge that needs to attach in a blue slot will have to turn blue in order to do so.

Each of the eight corners of the cube will have an assigned gluon (as already explained in section 2) and these have the colours already assigned in the theory of Quantum Chromodynamics. As you can imagine this is a much-simplified version of QCD and we will explain this more fully in a separate paper.

The Electron

The electron is currently seen as a fundamental particle, lepton, a point-like particle without any internal structure. The electron is the counterbalance of the proton, in that it carries the negative one charge (-1), however there is currently no explanation for how the electron creates this minus one charge, or why the electron is 1/1836 the mass of the proton.

In this Quantum Geometry proposal, the electron is made up with an internal structure of four antiquarks and one quark. This clearly makes the electron the opposite of the proton and gives it a structure that makes it possible to define its characteristics as a sub-atomic particle and its interaction with other particles within the atom or between atoms.

This sub-atomic particle carries the negative charge of the nucleus and achieves this by being made of four antiquarks and one quark. Because this is an odd number of quarks, we can call this a baryon. If we look at the baryon number, we find:

$$B = \frac{1}{3} (1 - 4) = -1.$$

So, this is also a baryon and with each quark having a $\frac{1}{3}$ charge we will also find: Charge $e = \frac{1}{3} (1 - 4) = -1$.

This model of the electron gives us exactly what we need, as sub-atomic particle, to complete the threefold structure of the atom, we can call it a baryon, giving all three sub-atomic particles the same type of internal structure.

This specific internal structure of the electron makes it virtually impossible to determine the structure of the electron using particle collision experiments. Firstly, all attempts to break open the electron have been unsuccessful, even using electron-electron collisions, and it is proposed that the energy required is much higher than the particle accelerators can ever reach. Secondly, the experiments may already be breaking the electron open, however, the four antiquarks instantly annihilate with quarks in the electron field, including the one quark contained in the heart of the electron, leaving nothing in the experiment to find except a scattering of photons that mix in with all the other photons, that always come from any particle collision.

Now we can look at this internal structure more closely, like we have already done with the proton and the neutron. The gluon equilibrium at the heart of the electron will now have 5 receptacles filled, four with antiquarks and one with a quark. The sixth receptacle also remains empty, in the electron. Like the proton the sixth receptacle is empty

and can take on an extra quark making the electron less negative or taking on an extra antiquark making the electron more strongly negative. These extra quarks or antiquarks, appear as real or virtual particles from the electron torus field whenever needed.

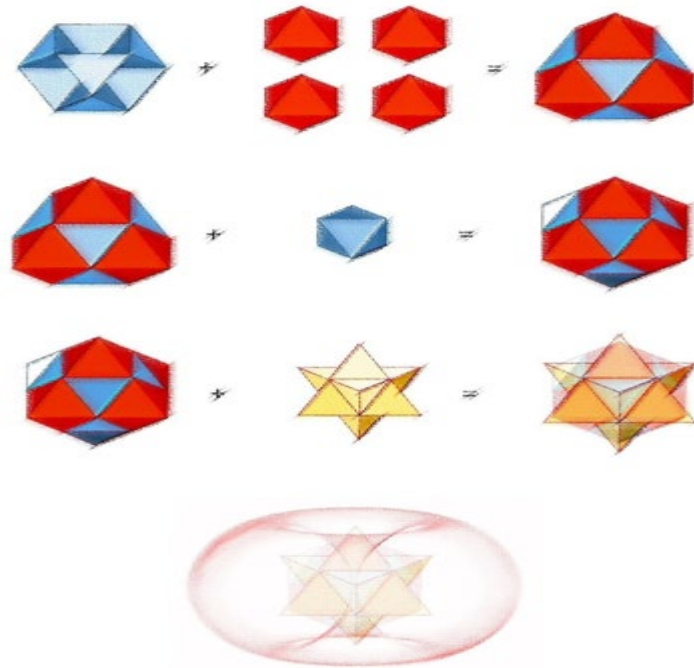


FIG. 3.4 - The Electron (-1)

Like the other two baryons, we start with the gluon equilibrium and this time add in four antiquarks then we add to this one quark. The red quark is only just visible behind the light blue gluons at the bottom and the upper left receptacle is empty.

But what happens next, at this stage of the model, is specific to the electron, and gives the electron its extra characteristics. The octahedral-shaped composite energy field of the electron attracts a photon (tetrahedral-shaped) to each of its eight faces, giving the electron a star-tetrahedral form. This is most likely due to the strongly antimatter character of the electron and the -1 charge, that attracts photons and virtual photons towards it, and gives the electron an extra, but small electromagnetic field, which adds to the torus field of the electron making it larger than what would be expected for the size of the electron.

This form and composition of the electron also gives a sound explanation of why the electron is held in orbit around the nucleus without decaying and circling inwards to annihilate with the nucleus. The electron has a predominance of antimatter quarks but still has one matter quark, four to one, the nucleus has a predominance of quarks but also many antiquarks, seven to four. There is always an attractive force of the electron towards the nucleus, but then a repelling force as it gets too close.

These forces will balance each other, depending on the energy carried in the electron, allowing the electrons to dance in tune with the nucleus, and inflating the atom up to a significantly larger size than would be normally expected, without them flying off so easily into the space around the atom. This balance also becomes very important in chemical bonding of atoms, electrical current flow, and electromagnetic phenomenon.

Electron size and mass

The electron is much smaller than the proton and has a mass that is only 1/1,836 of a proton, leading it to be seen as a point-particle similar in size to an individual quark and making it a fundamental particle. The rest mass/energy of the electron is 0.511 MeV, whereas a single up quark is 2.2 MeV and the proton is 938 MeV.

The maximum size of the electron is usually given as a radius of 10^{-18} meters, whereas the size of a single quark is also 10^{-18} meters. However, there is also a physical constant called the "classical electron radius", which has a

much larger value of 2.8×10^{-15} meters, greater than the radius of the proton, although this is not currently used in quantum physics.

So, how can we propose that the electron is a composite particle made of four antiquarks and one quark when its mass and size is no greater than a single quark?

The first explanation has to do with measurement. Antiquarks, even though they make up 50% of matter, are really guests in this world, being annihilated immediately when they are exposed. The electron contains four antiquarks, that give it a -1 charge and allow it to carry a large amount of energy, however when we trap the electron in order to measure it these antiquarks vanish symmetrically and instantaneously, radiating only photons and no other short lived exotic particles after the collision, leaving no trace that would give away their presence, other than a radiation of photons that are easily dismissed.

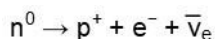
The electron is always surrounded by a cloud of photons, real and virtual, and this is what principally makes up its electron field, allowing it to carry a large amount of energy. It is this electron field that can expand the electron up to larger than the size of the proton, or even as large as the atom itself, or allow it to shrink down to the size of a point-particle. In collider experiments using electrons in collisions, the electron will always appear as this point-particle as the antiquarks are blown away in the collision, decaying almost instantly into the photon cloud appearing as extra photons.

The second explanation is more about a zero dimension, a field of particles that are truly point-particles, zero-dimensional particles and are now described in quantum physics as virtual particles. These are truly particles that can only be found in a world of space and time that is shorter than the plank length. Attempts to describe this zero-dimensional world began with ether fields and is now bogged down in relativity theory involving curved space-time or has moved on to a zero-point field and 'actual' virtual particles.

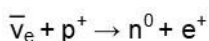
The electron may be so condensed by the strong force holding it together that the anti-quarks and the quark making it up are not always present as real particles, in this world, but are constantly moving in and out of the zero-point field in order to make a composite electron, anchored in space and time by a minimum of one quark. This single measured quark has a mass slightly less than that of a single up quark due to the negative addition of the strong force (gluon equilibrium) holding the electron together. This makes the electron a very powerful composite particle that is here but not here, real and virtual at the same time, working as an energy field that lives between the virtual zero-point field and the real world of matter, truly creating matter out of nothing (we will discuss this further in the next section).

Or the electron could be a combination of both of these explanations. The energy and mass of the electron is then mostly focused in the single quark in the gluon equilibrium of the electron, while the negative energy and mass of the four antiquarks is radiated out into the electron field around the electron via the photon star tetrahedron. This is why the electron has no defined or clearly measurable radius, but a probability field. The electron inflates the atom up to such a large size by having the potential to be everywhere in the electron orbit, the electron field is the negative energy of counterspace, of antimatter trying to return to counterspace.

This is also directly related to the ability of a neutron to transform into a proton and electron, or a proton to transform into a neutron and positron (anti-electron), via beta decay of the nucleus. This can only be possible if these particles are all made of the same building blocks using the same process. We can learn a lot more about particle physics when we study how nature works with the particle assembly kit. Such as neutron decay:



Here we see a neutron decay into a proton in the nucleus and eject a high-energy, high-speed electron, with the mysterious extremely low mass anti-neutrino as a byproduct. With their very low mass, of almost zero, the neutrinos seem to be pieces of the gluon equilibrium that are also ejected during the decay. An anti-neutrino fired at a nucleus can also disturb a proton and turn it into a neutron and a high-speed positron, that quickly annihilates with an electron.



Understanding these transformation processes between the sub-atomic particles of the nucleus and the electrons

orbiting the nucleus will bring us much closer to a recognition of electrons as composite particles made of antiquarks and quarks. This is true alchemy in the real world of quantumphysics and will be the subject of a further paper in the future.

Making up Matter - the Geometric Atom

We can now put together the atom using the three sub-atomic particles that we have created out of the void, the quantum vacuum. These three sub-atomic particles are all we need to create matter, molecules, biology, and life, to create our world, where we live and to create the planets, stars, and galaxies. Once we can make the atom everything else will follow, it is the atom that allows us to move as far away as possible from the surface of the sun, that ultimate threshold of energy, to a distance that is safe enough to allow biological life to unfold.

Making matter is a three-fold (three step) process that takes us through four levels:

0. The field with many names. The void, nothingness, empty space, quantum vacuum, theaether, zero-point field, quantum field, space-time fabric, matrix, abyss, veil, God.
1. Fundamental particles. Quark, antiquark, gluon, photon.
2. Sub-atomic particles. Proton, neutron, and electron.
3. The three-fold atom.

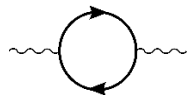
Step one is to extract enough energy from the zero-point field to create mass, creating something from nothing, and this is only achieved through the full collaboration of the four fundamental particles and the four fundamental fields, the basic ingredients needed to make physical matter.

Step two brings these fundamental particles, the raw materials, together into three sub-atomic particles that will be used to construct the true building blocks of matter, the atoms. Step three is to assemble these three sub-assemblies into our final end products, the atoms.

From here on we have an almost endless combination of atoms with which to build everything that nature can imagine and everything that we as humanity are being inspired to build as we become the creators of our own future.

The field

Before we can take the first step, we need to look fully at what the quantum vacuum is, the field with many names, and how it is that we can create anything from this field. This is probably the greatest mystery of all of science, and where it all begins. In quantum theory, the vacuum between interacting particles is not simply empty space, it contains short-lived virtual particle–antiparticle pairs (leptons or quarks and gluons). These short-lived pairs can be called vacuum bubbles. Although it can be shown that they have no measurable impact on any process, these virtual particle–antiparticle pairs can also occur as a photon propagates, and in this case, the effect on other processes can be measurable. This will cause vacuum polarization and is represented in Feynman diagrams by the following symbol:



These particle–antiparticle pairs carry color charge if they are subject to QCD such as the quarks and antiquarks, and the gluons, or the more familiar electromagnetic charge if they are electrically charged leptons or quarks. Such charged pairs can act as an electric dipole, for example, the electromagnetic field around an electron, these particle–antiparticle pairs reposition themselves, thus partially counteracting the field. The electromagnetic field will then be weaker than would be expected if the vacuum were completely empty. This reorientation of the short-lived particle–antiparticle pairs is called vacuum polarization.

The zero-point field, the quantum vacuum, is a sea of matter-antimatter potential. It is non-physical and cannot directly be physically measured in any way, although there have been many failed attempts to do so, especially because of the importance of this sea of potential to all of physics. However, like many aspects of physics, it can be ‘seen’ by way of its interactions with real matter. Despite attempts to describe quantum physics without the

quantum vacuum it is still seen as essential to the science of quantum physics. Up until the early 20th century the vacuum was an important field of study and was called the aether. The aether, or ether, was deemed outdated after the introduction of special relativity, however, despite this eradication of the ether, relativity actually says nothing about the existence or nonexistence of matter pervading space, only that any such matter must have relativistic symmetry. The modern concept of the vacuum of space, confirmed every day by collider experiments, is a relativistic ether, but we do not call it this because it is not accepted by scientists at present [5].

The ether sea of Quantum Geometry is active at both the macrocosmic scale and the microcosmic. In every star, including the Sun, we can actually see, with our own eyes, the direct effect of this vacuum energy as this is where, by far, the most matter of the universe is, in the form of plasma. At the burning surface of the sun both matter and antimatter are being created and destroyed in vast quantities. The burning surface of the sun is a threshold point between matter and antimatter where the activity of the quantum vacuum can be seen on a cosmic scale as it is at this threshold where sub-atomic particles and atoms can be forged. This is a true creation point of energy and matter. There is no physical restriction to the sun, and every star, being a matter-antimatter reactor, rather than a nuclear furnace, has simply never been fully investigated.

At the microcosmic level the quantum vacuum appears at the threshold point between every quark- antiquark pair, including the heart of every sub-atomic particle. It is this zero-point between matter and antimatter, quarks and antiquarks, that allows the quantum vacuum to power the physical world, that is converting the non-visible into the visible, energy into matter and back again.

The quantum vacuum should not be seen as an endless supply of energy, it is a buffer reservoir of energy that balances the energy needs of matter creation and its destruction, recycling. The greatest fluctuations in the quantum vacuum will appear wherever the most activity is, such as stars, where mass is constantly appearing and disappearing. At most other places where mass is present, such as planets, the fluctuations are much less extreme as the mass, matter, is much more stable. Where there is very little matter, such as the more empty regions of space, the quantum vacuum fluctuations will be closest to zero. This seeming magic is not accidental or unimaginable, it can only happen at the very smallest of scales, and for this we need to begin with the geometry of fundamental particles.

Fundamental particles

From this quantum field, the field of many names, step one is to create something out of this nothing, and this is where the magic happens. At the beginning of space and time, often referred to as the Big Bang, the universe created the energy vortexes now known as quarks, antiquarks, photons, and gluons. These fundamental particles can still be considered as point-like spirals of cosmic energy with no actual mass, although the quarks and their anti-particles the antiquarks do have a very small and measurable rest mass, it should be seen as energy moving towards mass.

These particles of energy create their own fields, the quarks creating the quark field that results in colour charge, quantified in quantum chromodynamics, QCD, and the electromagnetic field that is the result of the photons and is quantified in quantum electrodynamics, QED. These are real fields that create real effects in the world of matter, small and large, they become the raw material that we need to move on up to the next level, the sub-atomic particles.

Sub-atomic particles

Step two is assembling the three sub-atomic particles that are needed to construct the final atom. These particles are created using the raw materials provided in the form of the four fundamental particles and their force fields. This step is also not so easy and requires some second level geometry. At the heart of each sub-atomic particle is a gluon equilibrium made of eight gluons, all trying to return to the zero state in the center, creating a strong suctional force. This pulls in up to six quarks and antiquarks that will give the particle a +1 charge, for the proton, a 0 charge, for the neutron, or a -1 charge, the electron. These are the first composite particles and the first particles to be a true geometrically physical entity, to have real mass, to become matter in the world of matter.

Many of these second level particles were created at the start of space and time and are made of equal amounts of matter and antimatter, maintaining a baryonic symmetry in the early universe. Although many of these particles annihilated with antimatter most went on to make up the early stars, where most matter we see today is created, annihilated, recycled, and used to power our visible world. At the zero-point membrane that is the surface of the sun sub-atomic particles can easily be assembled out of the vast sea of fundamental particles circulating there. The sun

is a particle assembly factory that then radiates these sub-atomic particles, along with vast quantities of photons, out into the space of our solar system. Even though these sub-atomic particles are made of matter and antimatter they are much less likely to annihilate with each other and can now be used to make the next level of matter, the atoms.

The Atom

The completed atom, made up of protons, neutrons, and electrons, is the true goal of this process and is the third step. The atom, with its neutral charge, becomes the stable, fully massive (in the sense of having truly converted energy into mass, matter) building block of all molecules, chemistry, and biology, the building blocks of life. The neutral, 0 charge, of the atom is not only achieved by incorporating equal numbers of protons +1 and electrons -1 but is also really made of equal amounts of matter and antimatter, maintaining baryonic symmetry throughout the visible universe up to the current day. Our universe of matter is truly made of 50% matter and 50% antimatter.

Most of the atoms making up the earth and the other planets of the solar system have been forged and assembled in the fiery furnace of the sun, at the zero-point membrane, that particle assembly factory. This is where matter and antimatter can be built into sub-atomic particles that can then become assembled into the atoms, and then radiated out with the solar wind to fuel the planets. All sub-atomic particles or atoms that are misassembled or of poor quality are directly recycled back into the sun as new raw materials for new particles. The fiery surface and the corona of the sun are a particle factory that is powered by a matter-antimatter plasma reactor, providing light, warmth, electrons, and atoms for the rest of the solar system.

First the protons and neutrons are assembled into the heart of the atom, the nucleus, then around this nucleus, at a quite significant distance, the electrons are assembled, in electron shells depending on the atom being constructed. Geometry, symmetry, and harmonic balance are the guiding aspects for assembling atoms. Mathematically based formulas can do nothing more than attempt to describe what nature is already doing and are never the guiding principle in atomic physics.

The Nucleus

Together the protons and the neutrons make up the nucleus (+1), the great attractor, at the center of the atom. With this new Quantum Geometry model giving both the proton and the neutron a N-S polarity, due to the quarks and antiquarks making them up, they are able to nestle together much more easily in the nucleus, without repelling each other. The hydrogen atom has only one proton in the nucleus and no neutron, so of course doesn't form a ring, the next atom, helium already has two protons and two neutrons, and together these will be able to form the smallest of the nucleus rings.

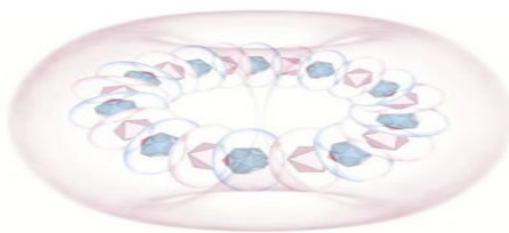


FIG. 4.1 - The Atomic nucleus ring (10Ne)

Our proposal is that the proton and neutron, rather than lumping together, will form a ring of alternating proton-neutron pairs, giving a very stable torus-form allowing the nucleus to become the strongly bound heart of the atom with a plus one charge (+1), figure 4.1. The two electrons traveling in a lemniscate form in the first electron shell can pass through the ring, giving a very stable first shell, allowing these electrons to jump easily to a higher shell or back to the first shell.

The circulating Electrons

Now that the nucleus gives the stable (+1) anchoring of the center, the zero-point of the atom, and most of its mass, the electron cloud (-1) is added to the atom to give it its size. The electrons are held in the atom by way of the electromagnetic charge and its interactions with the nucleus following the laws of quantum electrodynamics QED. For every proton in the nucleus there is a circulating electron. The smallest atom, hydrogen, has one proton (and no neutron) as its nucleus, with one electron. The next atom is helium, with two protons and two neutrons in the nucleus and two electrons. Then lithium with three protons, three neutrons and three circulating electrons, and so it goes on

all the way up to oganesson with 118 protons, neutrons and electrons. Isotopes of many atoms are also possible, that change the mass of the atom due to one or more extra neutrons in the nucleus, however the number of protons and electrons never changes.

This is the completed atom, coming in 118 atomic masses from hydrogen through to oganesson, without any gaps, although quite a number are unstable or don't appear naturally but have been made artificially in experiments. The atomic number gives the number of protons (and therefore also electrons) in the atom, and the atomic mass is double this number as it adds the mass of the proton and the neutron, although it is mostly not exactly double as other aspects of the atom. can add very small amounts of extra mass.

However, the number of protons and neutrons in the nucleus will give the atom 99.99% of its mass, its atomic weight, but it is the circling cloud of electrons that gives the atom its size, 99.99% of the volume of the atom is the electron probability cloud. This is the true inflationary part of the atom, and the electron appears to do this effortlessly, as if it is being inflated with antimatter, counterspace. The actual size of the atom is roughly 10,000 times the size of the nucleus! So, although the mass of the atom is condensed into an immensely small nucleus, the rest of the atom is all the work of the electrons. This is why atoms appear to be mostly empty space, however they are the building blocks of everything solid, everything we see, so that electron cloud is an immensely powerful aspect of the atom and in effect ensures that our visible world is as big, relatively speaking, as it is. This is due to the inflationary effect of the electrons, although the average size of an atom is only 1×10^{-10} meters, that is 1/100,000,000,000th of a meter, so we can still fit a lot of atoms into a sugar cube.

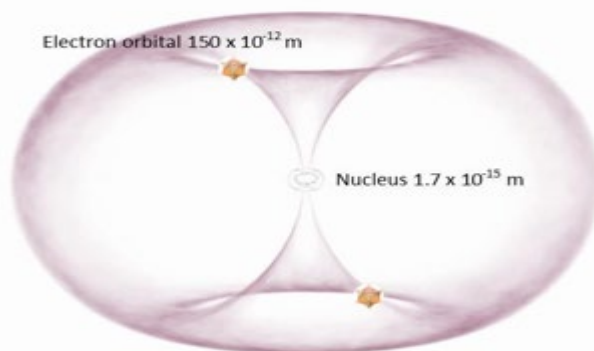


FIG. 4.2 - The atom, nucleus and circulating electrons.

The atom, although having a very solid and massive core is mostly a cloud of electron probability so, it can truly be seen as a torus of condensed energy. Figure 4.2 being only a representation of the atom, and while not drawn at all to a proportional scale, does give an idea of the inflationary effect of the circulating electrons, the atom is mostly empty space.

Having promoted the electron from being a point-like fundamental particle, a lepton, up to being a true composite particle pentaquark (four antiquarks and one quark), a baryon, we are able to investigate more deeply how and why the electron is able to inflate the atom so dramatically while still giving the atom its structure and solidity. This will be the focus of the next section but, first we will check in to see if our completed atom is maintaining baryon symmetry as we have proposed.

Baryon symmetry - the geometric atom

At present it is believed that the universe is made of matter, that it began at the big bang with an equal balance of matter and antimatter, quarks and antiquarks, but quickly lost most of the quarks and all of the antiquarks through a rapid annihilation process, leaving only a small number of quarks and a lot of photons with which to build the visible universe. There is no real evidence that this actually happened, but it is still the most commonly used explanation for baryogenesis, baryon asymmetry, at the beginning of the universe leaving only matter and no antimatter.

Now, using Quantum Geometry we will build a universe that avoids this dramatic imbalance, where the sub-atomic particles have been made up using quarks and antiquarks, held together geometrically by the gluon equilibrium, and we have assembled these sub-atomic particles to make up the atom. We can check this out to see if the atoms we have made will give the universe baryon symmetry, a Universe made of 50% matter and 50% antimatter, in perfect balance.

A three-quark baryon has a baryon number of +1, making it matter, a three-quark baryon with a baryon number of -1 would be antimatter and doesn't exist in a matter universe. In Quantum Geometry the geometric gluon equilibrium allows six quarks in the sub-atomic particles. The neutron has three quarks and three antiquarks with a baryon number of 0, the proton is a pentaquark with four quarks and one antiquark and a baryon number of +1, the electron is a pentaquark with four antiquarks and one quark and a baryon number of -1.

When the completed atoms are composed of these sub-atomic particles we find the smallest atom, hydrogen 1, has four quarks in the proton and one in the electron plus one antiquark in the proton and four antiquarks in the electron:

Hydrogen 1, $B = \frac{1}{3} (5 - 5) = 0$.

The next atom, helium 2, has eight quarks in the two protons, six quarks in the two neutrons and two quarks in the two electrons plus two antiquarks in the protons, six antiquarks in the neutrons and eight antiquarks in the electrons:

Helium 2, $B = \frac{1}{3} (16 - 16) = 0$.

Next is lithium 3:

Lithium 3, $B = \frac{1}{3} (24 - 24) = 0$.

As a last example we can look at carbon 6, and the isotope carbon-14 which has two extra neutrons in the nucleus:

Carbon 6, $B = \frac{1}{3} (96 - 96) = 0$.

Carbon-14, $B = \frac{1}{3} (108 - 108) = 0$.

A geometric universe maintains baryon symmetry without exception and is always in balance.

However, while the proton and the neutron appear in this world as if they each have 3 quarks, and a lot of other particle fields, giving them a large mass, the orbiting electron has a mass slightly less than one quark, making it appear otherworldly. The nucleus has a lot of mass to create the necessary plus one (+1) charge, while the electron achieves its minus one (-1) charge with very little mass. We need to understand this mass imbalance better. Let's take some Time to do this.

Time

The strange thing about what we have seen so far in our explanation of universal baryon symmetry, our claim that the universe is half matter and half antimatter, is that although we can add the antimatter in at all levels, by including it in the sub-atomic particles, it still appears as if it is not there at all. The neutron with three quarks and three antiquarks appears as if it is really only three quarks $B = +1$, the proton with 4 quarks and one antiquark also appears as if it is really three quarks $B = +1$, and the electron with four antiquarks and one quark appears as if it is really only one quark, a fermion. The antiquarks appear to not be real matter, with positive mass (+1), and also to not be negative matter, with negative mass (-1), either. In fact, we need to see quarks as particles of matter, traveling in space and moving forwards in time, and antiquarks as particles of antimatter, travelling in counterspace and moving backwards in time.

This is not as strange as it sounds as it is the only way to give our universe true symmetry, we balance matter with antimatter, space with counterspace, and time with reverse time. This is actually how our universe is built and we are living on the matter side of the zero-point membrane. Now you see why it is called the *zero-point* membrane, it is the threshold between two worlds and both of these worlds exist in balance with each other, see figure 1.2. The only way we can stretch matter, space, and time away from the zero-point is when this is balanced, by nature, the universe, on the other side of the membrane by antimatter, counterspace and reverse time. We borrow antimatter from counterspace to create matter here in this Time, this Now, especially when inflating the atom in space via the electron probability field. Counterspace borrows matter from our space to create its antimatter in its time, which is also Now. Time is always at the zero-point, it is always Now, whether you are here or there. Now is the fulcrum between space and counterspace and between time and anti-time, or QuanTime. (Appendix A).

Reverse Time (emiT)

Time has to be the reverse in counterspace. The counterspace world is at the same time as our world of space, the time of space and counterspace are synchronized, we are always together in the same now. This means that the counterspace world begins, their big bang, when our world of space ends, and travels backwards in relation to our time, to end at the moment that our world begins, at our big bang.

The particles of antimatter, the antiquarks, that we borrow from counterspace are traveling backwards in time. To produce an antiquark here in this world it is borrowed from the future, and it will be paid back into our past. The antiquarks needed to create an electron here are all travelling backwards in time, even though they make up our now, they have been captured from the future and disappear into the past.

When trying to measure these antiquarks in this world we only find an empty space where we are expecting to find them, we know they should be there but can't see them, we are not thinking to look behind us, (where most things are hiding). Compared to measuring a quark, we are expecting to find them disappearing off into the future, in front of us, and that is where we find them, exactly where we are looking. Our arrow of time points towards the future, leaving the past behind us, and the arrow of anti-time points the other way, towards the past, leaving the future behind it.

SpaceTime

Our visible universe is a balancing of space and counter-space, see figure 1.2. The counterspace universe is not just a proposal, it has to be a reality, space and counterspace need to balance each other and the zero-point is Time. This is the true meaning of SpaceTime or rather QuanTime.

Time is always in the now, it is the zero-point. When we move forward in time towards the future in space the zero-point will move with us, however, this means that it is moving into the past in counterspace. Time and anti-time are inextricably tied to each other, and where we are is always thenow. Relativity is describing moving in space with respect to an observer moving in counterspace, they can never be disconnected in time, they must always be in the now, not simply there in their own now but the now of the zero-point, absolute time.

Violation of this law can only occur if you are able to travel faster than the speed of light, this is in effect the escape velocity of space. If this happened, you would enter counterspace and start travelling backwards in time. However, the closer you get to the speed of light the slower time will pass for you in relation to the zero-point, the exchange of quarks and antiquarks, that you need for your physical body, with the zero-point field begins to get closer to going out of the now, out of synchronization, and this cannot happen, you get heavier and slow down.

This means that not only space is quantized, but also time. In order for time and anti-time to pass through each other and synchronize in the now, to be always in the now at the zero-point, one moving forward and one backwards, they need to be able to step into this point and step out again. This is one quanta of time, which already has a proposed name, the chronon, and may be the length of plank time, or it may be the time for light to travel the classical radius of an electron [6]. In Quantum Geometry we propose that one chronon is the length of time for a quark-antiquark pair to oscillate into the zero-point field and back out again.

Creating a universe out of only matter, with no antimatter, the one-way arrow of entropy; with only time and no anti-time, the one-way arrow of time; and only gravity with no levity, the one-way arrow of gravity, is simply not possible, this is not how nature works.

The illusion that mass is bending spacetime is actually the reality that space stretches into counterspace and counterspace stretches into space, and this happens everywhere that there is a single matter-antimatter particle pair, a zero-point, or more. This is not a physical Newtonian bending of space, or a relativistic bending of space-time but is a result of the quantum vacuum, zero-point, pulling matter towards antimatter, and antimatter towards matter.

All quark-antiquark pairs that are locked in matter, in sub-atomic particles and atoms, that have been stretched away from the zero-point, on the space side of the torus, will try to return to the zero-point whenever they can, and always will if they can. At the center of each massive object, whether it is a planet, moon, mountain, atom, or the sun there is always a central zero-point. This has been called the center of gravity ever since we started to associate this with relativistic space-time.

At the center of the earth is a zero-point center of mass that represents the total of all the massive objects making up the earth. We are pulled towards this zero-point with 1 g (using the current earth measurement of gravity, which is really based on what we see, rather than what we know). Falling towards the center of mass is about exchanging quarks and antiquarks with the zero-point field, if we could negate all of the mass zero-points, matter, between us and the center of the earth, we would fall to this central zero-point. Standing on the moon we experience much less pull, only 0,166 g as the center of mass of the moon is much smaller. We are also falling towards the sun.

The Sun

The largest zero-point in our part of the universe, our local zero-point, is the Sun, and in fact, this zero-point is not just due to the mass of the sun itself but also all of the mass included in our solar system, planets, moons, gas giants, asteroids, comets and so on, everything. Everything with mass in the solarsystem is falling towards the sun, the sun is the center of its own small universe and has a torus of energy, and matter, stretching all the way out to the heliosphere, and probably beyond, although theheliosphere is a good point to stop, it is the boundary where the plasma bubble of the sun goes over into the much less dense plasma of space. The sun is certainly the center of our universe for now.

Although measuring the mass of the sun is not so easy, it is more of a calculation than a measurement, and is currently given as 2×10^{30} kg, which would have a person weighing in at 28 g if they were able to stand on the visible surface of the sun. However, standing here on the surface of the earth, which is much safer, the sun is pulling on you, and the entire earth at 0.0006 g, not much pull for such a big zero-point mass, but still enough to have us and the earth falling in towards the sun, or rather into orbit around the sun and not flying off into space.

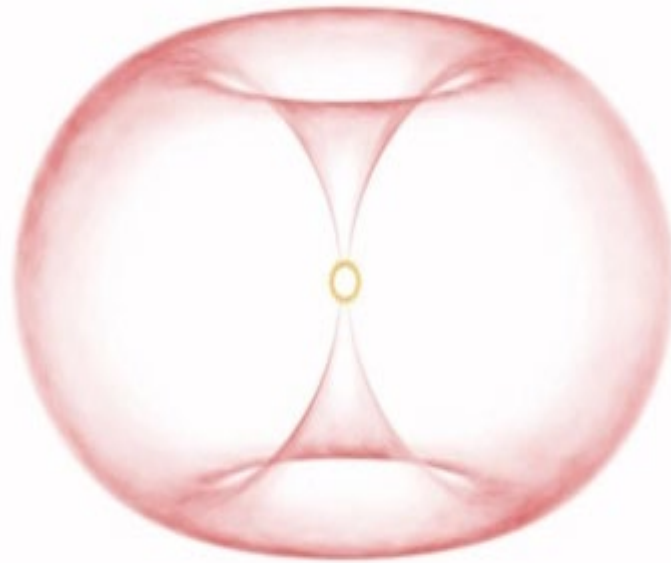


FIG. 5.1 - The sun torus (heliosphere)

Although not drawn to any real scale, figure 5.1 gives an idea of a torus shaped heliosphere of the sun, the sun is of course the central point of this torus and becomes the zero-point center of this solar system. However, imagine (we will do a short thought experiment here) that the upper vortex of the torus is a light cone leaving the sun and that our own solar system rotates within this light cone, with the planets closest to the sun deep in the vortex and the larger planets out closer towards the rim of the vortex, this is then the space side of this sun system. A second light cone vortex leaves the sun underneath the sun, a second solar system could easily nestle into this light cone, a counterspace solar system on the counterspace side of the solar torus. (Appendix B).

There are a lot of parallels between this solar torus and the light cone of space-time, figure 5.2. Light travelling 'upwards' from the sun through our space-side solar system moves from the past to the future, just as we know it to do, and light travelling 'downwards' from the sun through the counterspace-side solar system will be traveling from the future to the past relative to our movement. The sun is a zero-point in quantum space-time, containing both a region of space and a region of counterspace, matter and antimatter, and time and anti-time. The 'now' of this sun system is also centered at the zero-point of the sun. The now of our earth-time is in synchronicity with the now of the zero-point of the sun and the now of the counterspace planets.

The zero-point of the sun is our local zero-point, it is also part of an even larger zero-point system within in the Milky Way galaxy, and ultimately the zero-point at the center of the galaxy, although these zero-points have much less obvious effects here on earth.

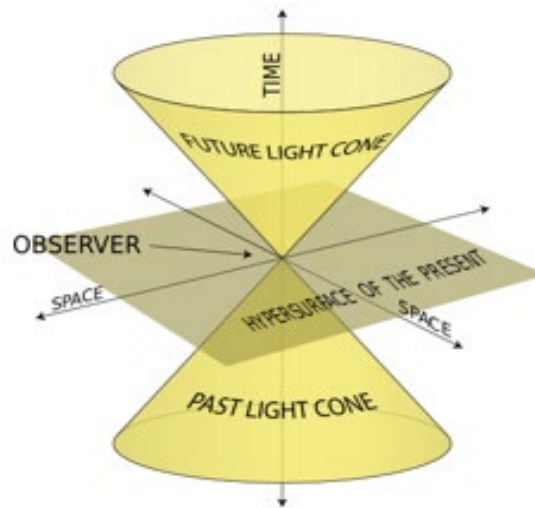


FIG. 5.2 - Light cone - Image Wikipedia

The zero-point of the sun is also important for us as it is the special matter-antimatter transition point where particles, sub-atomic particles, and atoms can be forged anew, out of the recycling of matter, light, and energy at this reaction threshold. We know that this is happening because we can see and feel the effects of this reaction, the surface of the sun is a real matter-antimatter annihilation zone, creating vast amounts of light (photons), warmth, particles, electrons, and atoms that are radiated outwards to the planets, where it can be used to power life here. This is our only true energy source, and we rely on it every day, it is through this process that the zero-point energy of the sun is radiated out as far as us here on earth and further to the outer planets.

The zero-point center of the earth itself is a center of mass but has not yet reached a critical mass where a full matter-antimatter annihilation takes place, fortunately for us, as it would then ignite to become a sun itself. There is certainly a possibility that this may indeed happen in the far future, and that Saturn was indeed the old sun that originally powered this solar torus before the Sun took over. At present the zero-point center is massive enough to give us 1 g of gravity, which certainly helps life here on earth, and to keep a residual of warmth in the depths of the earth, also good for life on earth.

Lastly, all of the smaller zero-point centers of every massive object here on earth, all the way down to the quark-antiquark pairs, and baryon quarks, are all playing their part in keeping us above absolute zero, on the matter-side, making the earth real matter, a rock on which we can live, an unimaginably wonderful region of life in an otherwise dramatically hostile region of space.

In effect the zero-point of each object of mass, from the sub-atomic particles all the way up to the sun torus, and even the galactic center, is the rest-mass point of the object, and allows us to treat each of these systems as classical Newtonian mechanical systems. We are then able to use classical mechanical calculations, rather than the significantly more complex quantum mechanics, to analyze most aspects of these closed systems and their interactions with the closed systems around them. This will be the focus of a follow-up QuanTime physics paper.

Appendix

QuanTime Geometry

At the start of time, and the start of space, at the big bang, charge, parity, and time (CPT) were in symmetry. However, they now appear to be asymmetrical in most aspects, especially time, as it is very hard to argue that it could be reversible. In QuanTime Theory we are going to show that our universe still has CPT symmetry at the fundamental level, and that this is in fact essential for it to still exist.

Quantum Geometry has shown that our universe conserves baryon symmetry, that it is made up of equal amounts of matter and antimatter, and that this also brings with it the reversibility of time. Antimatter passing through space will have to travel backwards in time, and we will now show that it does.

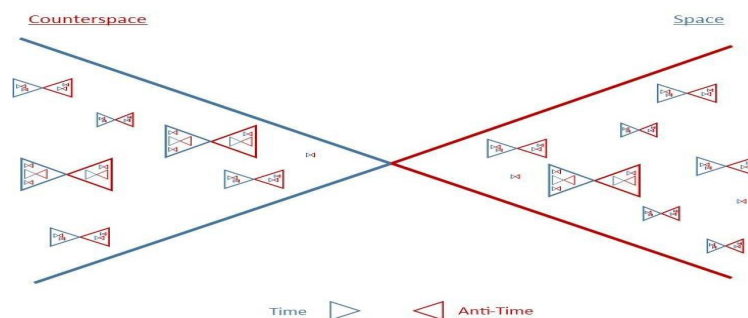


FIG. A.1 – Zero-point Matrix

On the space side of the zero-point, quarks (matter) are focused, or condensed, into point-like particles due to their forward movement in time (our viewpoint), and on the counterspace side of the zero-point, antiquarks (antimatter) are spread out over an area of space (the probability field) due to them moving backwards in time. If we were standing on the other side of the zero-point (reversal of viewpoint) then the antimatter would be focused into point-like particles and the matterspread out.

Conveniently we can rank the 10 levels of physical existence as follows:

0. Zero level - The zero-point field, the matrix of all zero-points, Time. Universal consciousness.
1. First level - The fundamental particles, photons, gluons, quarks, and antiquarks, Space.
2. Second level - Sub-atomic particles, neutron, proton, electron, Building blocks of matter.
3. Third level - Atoms, Table of Elements (118 elements). Matter.
4. Fourth level - Chemistry, crystals, minerals, molecules, Substance.
5. Fifth level - Biology, small cellular life, microscopic life, Bio-sphere.
6. Sixth level - Large biological life, plants, animals, humanity, macroscopic life.
7. Seventh level - Large systems, seas, atmosphere, geosphere, planets, moons.
8. Eighth level - Stellar systems, the Sun, stars.
9. Ninth level - Interstellar systems, galaxies, galaxy clusters.
10. Tenth level - The whole Universe.

A new Universe is born at the moment the first quarks are extracted from the zero level, the Universal zero-point, creating the first spatial zero-point, Space, and the first tick of Time. These first two quarks must be, and always be a quark-antiquark pair as this is the only way to create a new physical zero-point, that is above the universal zero-point of time, Universal Consciousness. All further quarks will also be added in pairs, creating a fabric, or field, of zero-points. This is the first level of existence, level one, the level of fundamental particles. Quarks will be on one side of the zero-point field and antiquarks on the other side. As the quarks and antiquarks move across the field, they also create ripples in the zero-point field, the first electromagnetic waves. Ripples on the quark side of the fabric, space, can create and radiate photons into space. Ripples on the antiquark side, counterspace, will create gluons that create a suctional force on the space side of the fabric. The fundamental particles of level one are the quarks and antiquarks, and the photons and gluons.

Level one creates a fabric of zero-points, the zero-point field, with quarks and photons on the spaceside, and antiquarks and gluons on the counterspace side, there is always a separation between antimatter and matter particles at this fundamental level. All zero-points at level one are synchronized with the universal zero-point of level zero. Particles traveling on the space side will appear to travel from the past to the future, for an observer on the space side of the fabric. For the same observer antiparticles will appear to be traveling from the future to the past.

Sub-atomic particles are formed on level two using the fundamental particles of level one as buildingbricks. All particles on the space side of the fabric are now called matter at level two, and are made of quarks and antiquarks, whereas all particles on the counterspace side of the fabric are called antimatter, even though they are also made of both quarks and antiquarks. At level two, particles of matter have extracted antiquarks from counterspace and assembled them, together with antiquarksinto the subatomic particles, each and every particle having a secondary

level zero-point within in order to keep the quarks and antiquarks separated. These second level zero-points are created using the energy point-like particles called gluons to form a gluon equilibrium, each gluon equilibrium is able to carry up to six quarks. These are the first composite particles.

The second level composite particles are most commonly the neutron, proton, and electron, although there are many others. These second level particles can move much further away from the zero-point fabric of level one as they have their own zero-point within, and their own energy field created and maintained by the tension field between the quarks and antiquarks that make them, in the form of the torus. The second level zero-points are synchronized with the level one zero-points and thus also with the universal zero-point. Matter sub-atomic particles are always on the space side of the level one zero-point fabric, and antimatter particles on the counterspace side thus avoiding annihilation. They carry antimatter deep into the space side of the zero-point fabric where the composite particles can be used to construct larger particles of matter, the atoms.

At the third level we can assemble the first true atoms. On the space side we will create atoms of matter, using the neutron and proton to assemble the nucleus in the center and using the electrons to inflate the atom up to an immense size, for an atom. Bringing these three sub-atomic particles together in the atom ensures that the atom always has an equal amount of antimatter and matter. The nucleus, with more quarks than antiquarks takes on a +1 charge and becomes condensed into a small point at the center of the atom, it contributes 99.99% of the mass of the atom. The electrons, with more antiquarks than quarks, and a charge of -1, balances the nucleus and spread out far into the space outside the nucleus, contributing 99.99% of the volume of the atom.

The atom creates its own third level zero-point within the nucleus around which the electron shells assemble, the electrons on one side of this zero-point will have a spin-up orientation and on the other side a spin-down orientation. As large composite particles they are able to create the first massive objects of matter, that is objects with mass and volume. The atoms become the true building blocks of all of matter, from molecules, to organisms, plants, animals, and humans, and on to create planets, stars and galaxies. These third level particles are also synchronized, via the second and first level zero-points with the universal zero-point, keeping all of matter synchronized with universal time, absolute time, QuanTime.

Even in the atom the quarks making up its sub-atomic particles are travelling forward in time, and the antiquarks are traveling backwards in time. The zero-point of the atom, and of each sub-atomic particle making it up, maintain the synchronization that ensures the atom does not fall apart, the atoms don't even know that this is happening as everything is always in the now of absolute time.

Time is the coordinating factor, the binding element that holds all of matter together. Allowing full CPT symmetry, even at the level of the atom. The atom is charge balanced, matter-antimatter balanced, and balanced on the fulcrum of time, always in the now. This is what quantum physics had initially promised us but without having a truly matter-antimatter balanced atom, has never been able to provide.

From here on up the following levels operate more like we already know. The Sun, the planets, the Earth, and all of life on the Earth operate within this system.\

Light

Light travels in Time. Time is created by the synchronization of light. This is why it is a constant speed, c . The local zero-point of the system, the Sun, creates and radiates light, these quantum packages of light travel at light speed and are also the speed of time, the tick of the system clock. Light synchronizes all zero-points in the system by traveling simultaneously both forwards and backwards in time within the complete system. Photons traveling forward in time and gluons traveling in anti-time.

Photons stretch the etheric sheaths of the sun out into space, the light cone. Gluons provide a return path, grounding, back to the sun. Photons are radiating and gluons suctional, a membrane forms between these two forces, the zero-point, or quantum vacuum, made up of all the zero-points within the system. This membrane is filamentary in nature, however, in effect it forms a network or fabric of space-time, QuanTime.

The speed of light is the escape velocity of the solar torus. Energized photons (non rest mass photons) travel in time, towards a target, while the gluons travel backwards in time towards the source. A photon never leaves a source without already knowing its target! Atoms are the physical stepping stones (the physical medium) that energized light (frequency) travels in, via the light ether, a non-zero field, that we know as electromagnetism.

The Zero-point Sun. Solar Torus

Our local system, the structure in which we live and operate, is the solar torus, the Sun. This system is a fully harmonized, self contained, resonating unit, within a greater system that we know of as the Milky Way Galaxy. At the center of the Sun is the local zero-point that harmonizes and synchronizes the system all the way out to the edge of the Solar System, the heliopause. The schematic of this zero-point matrix of the Solar Torus is the same as shown in figure A.1. The Sun sits in the middle of the matrix, at the crossing of the two main lines, giving a space and counterspace aspect to the Solar Torus, as shown in figure 2.3, figure A.1 would then be vertical rather than horizontal, much like an hourglass, with one light cone, or funnel facing upwards and the other downwards representing the two vortexes of the torus.

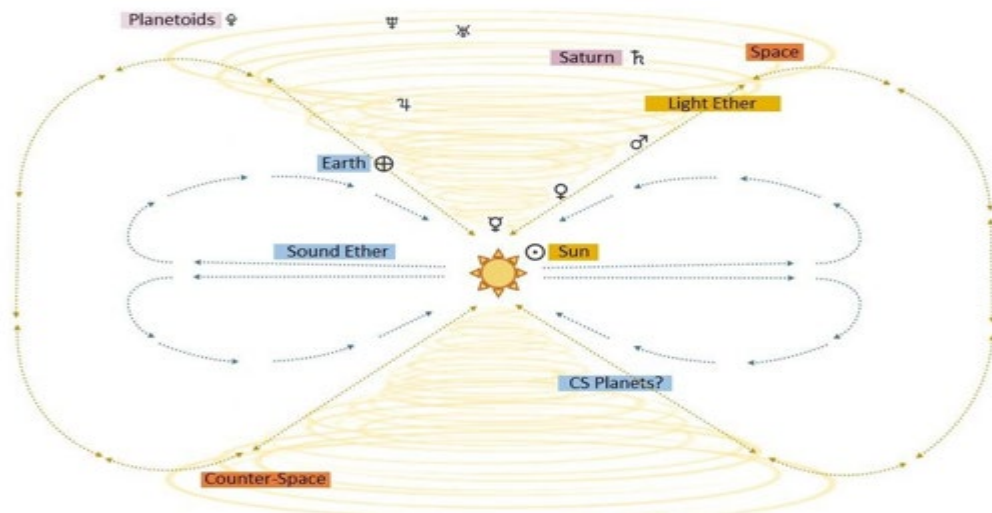


FIG. B.1. The Solar Torus Vortexes

Figure B.1. shows this better, with the upper vortex (Space) containing the planets of our Solar System, and the lower vortex giving the possibility of a second system of planets (Counterspace solarsystem), which actually very likely exists, in order to balance our planetary system.

The Sun can no longer be described as a nuclear sun but instead becomes a matter-antimatter reaction, with matter (Space) on one side of the Sun, and antimatter (Counterspace) on the other side. Most importantly, the Solar Torus becomes a self-contained whole, with light leaving the sun in the upper vortex (light cone) circulating around the outside of the torus to re-enter the sun via the lower vortex, and light leaving the sun via the lower vortex re-entering via the upper vortex. Almost all light leaving the sun will be recycled using the torus, there is virtually no wasted energy, just as nature sets up most systems within the universe. This curving of light around the Solar Torus is created by the immense magnetic field of the sun, that stretches all the way out to the heliopause. It takes light approximately 3 days to make this journey from north to south or south to north.

From this toroidal theory of the Sun, you can see how the zero-point of the Sun becomes our local zero-point that governs the speed of light and synchronizes all lesser zero-points within the system in time, Absolute Time. The Earth, operating within this system, has its own zero-point within the center of the Earth and every object or being on the earth also has its own lesser zero-point, all the way down to the atoms and the sub-atomic particles. All of the zero-point centers of these beings make up the central zero-point of the earth, that also becomes the center of gravity of the earth. All of the zero-points of the planets, moons, comets, asteroids, and other objects within the Solar Torus make up the center of gravity of the Sun.

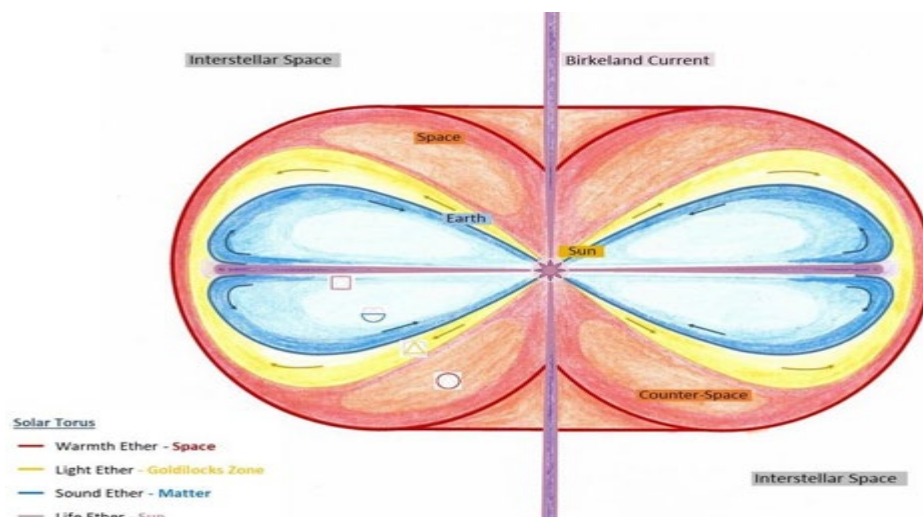


FIG. B.2 – Solar Torus Energy Fields

Leaving the Sun at its north and south poles is a narrow, highly focused beam of light and energy, known as the Birkeland Current, that connects the Sun energetically with the planets within the system, and the Sun itself with its nearby stars, and the network of stars connected with the central zero-point of the Milky Way Galaxy.

The Sun is our local source of energy, fueling everything that happens within the Solar Torus, including everything on our own planet. It governs not just the rotation of the planets, but also the speed of light, and most importantly the quantum tick of Time for every lesser zero-point within the system. The Sun holds both sides of the torus in perfect equilibrium and harmonic resonance in a cycle of breathing in and breathing out. All energy, photons, gluons, electrons, and atoms needed to maintain this equilibrium are supplied by the Sun, via the matter-antimatter reactions of the Sun, and all energy not used is always recycled back into the Sun.

Pure warmth and light can be exchanged by both sides of the torus, however, everything of a physical nature, everything made of atoms or subatomic particles of matter must remain on the matter (space) side of the torus and everything made of antimatter must remain on the antimatter (counterspace) side. At the surface of the Sun itself there is a continuous matter-antimatter reaction that can be seen as the powerhouse or cauldron of warmth and light energy supplied by the Sun.

As the Sun itself moves through the galaxy it pulls the planets along with it in a beautiful spiraling of planetary paths, the dance of the planets that is also choreographed by the Sun. This should also mean that the counterspace planets, on the counterspace side of the torus, would need to be pushed ahead of the Sun, which is quite counterintuitive, however, this is not what actually happens, as the counterspace planets are antimatter planets (not a good place for us to visit directly), which means that they are travelling backwards in time, from the past to the future in their time but from the future to the past in our time. This is why Absolute Time is so important, all zero-points, whether on the space side of the torus or on the counterspace side must be synchronized. The tick of time is a pendulum swing between time and ant-time past and future and we are always in the present, the now, where past and future are always in balance, along with space and counterspace, matter and antimatter, quarks and antiquarks, photons and gluons, light and darkness, electricity and magnetism, gravity and levity, entropy and syntropy, and masculine and feminine. We live in a world that has no one-way arrows, everything is in balance, everything. This is the world of QuanTime, the world of Quantum Geometry.

Conclusion

There are no physical barriers to investigating a baryon 0 universe, a balanced matter-antimatter universe. It is important however, to realize that this balance is achieved at the level of the fundamental particles, the quarks and antiquarks, the level closest to the zero-point field. Once these are incorporated in the second level particles, the sub-atomic, these go on to appear as real matter particles. They would annihilate if meeting any antimatter particles on this second level and above.

However, they very rarely do, as antimatter sub-atomic particles do not exist in this matter world.

Due to the geometric nature of the matter and antimatter quarks making up the sub-atomic particles, the proton, the

neutron, and the composite geometric electron, the atom always has a baryon number of 0, symmetry. Everything in this world is made up of atoms, and so everything maintains this balance, creating a baryon 0 universe. We should be living in a balanced matter- antimatter world, with baryon symmetry (rather than the currently measured baryon asymmetry of +1), and we are.

The neutron is a balanced particle with a baryon number of 0 (three quarks and three antiquarks), the proton with a baryon number of +1 (four quarks and one antiquark), is attracted and locked into the nucleus with the neutron, creating the center of mass of the matter universe, the electron has a baryon number of -1 (one quark and four antiquarks) and is expelled from the center, inflating the atom to more than 10,000 times the size of its heart, creating the space of the universe. It takes all three of these sub-atomic particles to create the space, time, and mass (matter) of the balanced universe with a baryon number of 0.

Space and time are truly united at the zero-point between space and counterspace, time and anti- time, when we understand the true mirror aspect of our universe. The zero-point field is made up of the total of all the single zero-point centers making up an object with mass, from the level of the atom, up to the planets and the sun, and on to the galaxies and the universe itself. The zero-point field synchronizes time for all zero-point centers within the system and keeps time and anti-time always in the now, the present or absolute time. Time becomes quantized just like space, and one quantum of time, a chronon, is likely to be the time taken for a quark-antiquark pair to oscillate into the zero-point and out again.

Quantum physics now has the information needed to go ahead and physically investigate this new science. The first challenge is to establish a real-time method to measure the antiquark as it travels backwards in time through our world. At present it doesn't register on our matter-based measuring equipment and so we don't see it clearly, even though it is there, in all three sub-atomic particles. Experiments based directly on light itself are even now hinting at this new technique, they are already showing the presence of antiquarks and antiparticles traveling backwards in time, however, we have not yet fully understood this. The double-slit experiment and quantum entanglement are two good examples of how we are meeting with antiparticles and anti-time.

"Philosophy [nature] is written in that great book whichever is before our eyes - I mean the universe - but we cannot understand it if we do not first learn the language and grasp the symbols in which it is written. The book is written in mathematical language, and the symbols are triangles, circles, and other geometrical figures, without whose help it is impossible to comprehend a single word of it; without which one wanders in vain through a dark labyrinth."
Galileo Galilei

The universe is a fully symmetric and geometric whole, balanced on all levels through the zero-point field, space and counterspace, time and anti-time. Looking through the telescope of our collective wisdom we are now discovering the other half of our Universe for the first time, discovering the universe in its fully dual nature, we are leaving the dark labyrinth, setting ourselves free, free to wander the great book of Nature.

Quantum Geometry not only gives a new, and complete, look at the geometric structure of the universe, of nature, at all scales, it also opens the door to a completely new science. We could call this QuanTime physics, as we are not combining space and time, as in the SpaceTime of relativity, but we are combining the quantum world, the subatomic and atomic world of space with the zero-point of the universe, Time, combining quantum space and quantum time, QuanTime. This is not an annihilation science but a science of order, of wholeness. QuanTime physics is the first truly post relativistic, post Einsteinian physics, that anchors the momentum of space to an absolute time.

QuanTime physics will finally explain much of the new electronics that is being developed at present but not yet fully understood, will enable a more complete understanding of the new chemistry and material science, and importantly will finally enable us to truly develop the new energy projects that are so necessary for our future.

The Solar space-counterspace torus opens a whole new view of the universe and astronomy, and could very quickly simplify space travel, interstellar travel, and spacecraft propulsion.

A balanced matter-antimatter atom can explain so much about chemistry, molecular science, and biology, that will enable whole new approaches to material science, the biology of life, and health. It may enable us to take a path into the future that is less technology oriented and more based on a balance between technology and nature. Nature has always been recycling energy, balancing systems, working in harmonic resonance, and fully respecting the balance between the masculine and feminine aspects of life.

This is a 21st century Alchemy that takes us out of the current paradigm of science into a whole new world, a world that finally balances the one-way arrows of time, gravity, matter and entropy, showing that our universe is not out of balance, asymmetric, but balances matter and antimatter, time and anti-time, gravity and levity, electricity and magnetism, entropy with syntropy, and masculine and feminine. Our universe has not reached an untenable state of

baryon asymmetry, with a hopeless search for antimatter, but is baryon symmetric, and always has been.

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