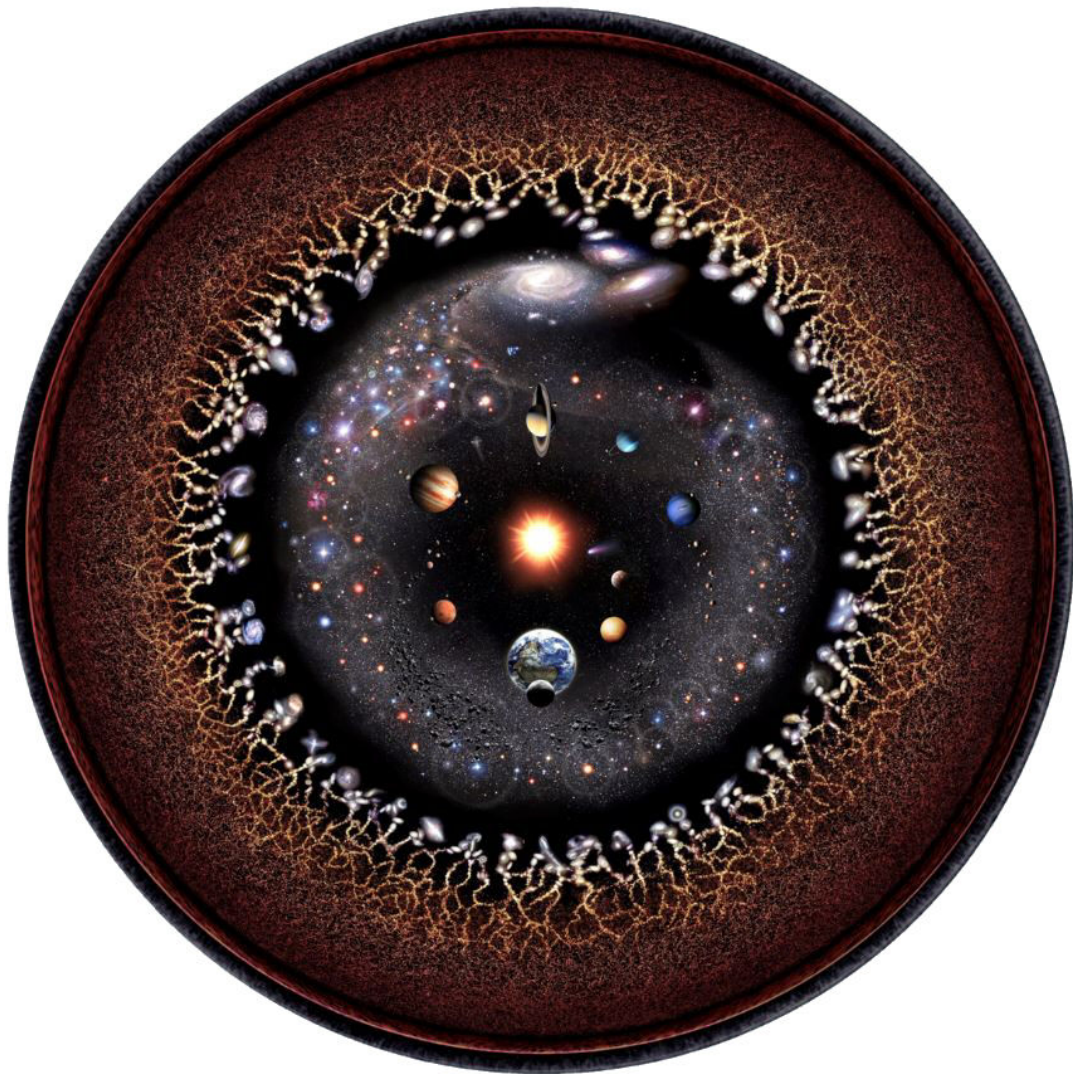


A (nother) Theory of Light

A new view on space and time and life itself

PART 1 of 2 (Introduction and general topics)

by Dipl. Ing. Horst H. Gruhle



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The "lite on math" version.

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*... risen out of a sea of true randomness,
we are the embodiment of probability,
being in-formation only, but
free willed, we are still
just ripples in space ...*

hhg 7 Sep 2021

Dedicated to the Free World

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1.0 Vorwort

When I started this journey of discovery, I only wanted to shed some light onto electromagnetism ... however, as I progressed, more and more insights popped into my field of vision and it almost turned into a "*theory of everything*" ... kind of. Yet, the basics seemed so trivial and you'd think, someone would have come up with a plausible theory like this a long time ago ... but instead, when we ask questions, we are confronted with a wall of mathematics ... and a "*trust the science*" attitude ... don't even **try** to understand it ... and so on. You might be inclined to think, the wall of mathematics has become a prison for the science of physics. So, I wonder why it *is* the way it is ...

First of all, after WW2 and the bombing of Japan, science became the dominant weapon in fighting adversaries. Although evident long before Hiroshima and Nagasaki, when gun powder made its *début* in china, never did anyone have the power of destruction on this scale ... and maybe the "*real advances*" in physics have been hidden from the public domain ever since (?) This surely must be a "*Conspiracy Theory*" ... right (?)

Or is it the entry requirements into the world of physics, that exclude the "*real thinker*" from the fields of discovery, requirements that only allow highly skilled mathematicians to play (?) Hence the attitude "*Shut up and calculate*" (?) No imagination needed (?)

Here is an excerpt from the CERN "*science*" website ...

"W and Z bosons" are responsible for the weak force. Although not yet found, the "graviton" should be the corresponding force-carrying particle of gravity. The Standard Model includes the electromagnetic, strong and weak forces and all their carrier particles, and explains well how these forces act on all of the matter particles. However, the most familiar force in our everyday lives, gravity, is not part of the Standard Model, as fitting gravity comfortably into this framework has proved to be a difficult challenge. The quantum theory used to describe the micro world, and the general theory of relativity used to describe the macro world, are difficult to fit into a single framework. No one has managed to make the two mathematically compatible in the context of the

...

Looking at the last few years, and how the "*military industrial complex*" operates, together with the "*media industrial complex*" and now also joined by the "*medical industrial complex*" ... and the "*political industrial complex*", all on a global scale, would you be surprised to see the emergence and establishment of a ***science industrial complex***, with billions of dollars flowing into it ... and all the scientists clinging onto the "*einsteinian world view*" ... because their jobs depend on it (?)

Whatever the reason, I expect accusations of being ill informed, misguided or just not knowledgeable enough ... nothing to see here ... no one looking. In fact, I wonder if I should release this *construct of ideas* at all, considering what happened over the last few years and what we are all heading towards ... I guess I should anyway ☺

Talking about ideas ... everything that is written here, in regards to electrons and photons and the models presented, has been carefully derived from existing knowledge. The conclusion regarding the information universe is one, that I have heard some years before, but dismissed at the time as being silly. Believing in a *information universe* as described here, has some profound consequences, especially in regards to certain believe systems such as Buddhism and reincarnation etc..

To get a more thorough and complete understanding of what I am trying to convey in this book, it may not be enough to just read it once or twice, in particular section 8 (regarding the electron) and section 9 (regarding the photon) and also section 7 (regarding time).

Section 3 and 4 (regarding the universe) and section 6 (regarding space) have been included to project a "*point of reference*" ... since nothing really exists in isolation ... and more so, since this *construct of ideas* has a profound impact on how to think about space, time and gravity in the macroscopic and in the microscopic world.

As for the sections on space: Whether e/m-granules really exist or not, is of no consequence to the derived models. The notion of *ur-space*, *ur-time* and (*ur-*)*energy* being at the foundation of it all, is entirely acceptable ... in particular the notion that the space *we* experience is not the same space as the ur-space ... and the time *we* experience is not the same time as the ur-time ... and the notion that energy, whatever this is, *is* the driving force and the *essence* of all existence.

... Happy reading ☺

*And as always ...
Believe Nothing,
Question Everything.*

Horst.

1.1 Introduction

When I was young(er), I studied Electronics and Micro Processor Technology in Germany. A large part of my studies then, focused on electro-magnetic phenomena, photons and electrons. After obtaining my degree as an Engineer (Dipl. Ing.) I engaged in some postgraduate studies of physics (Nuclear Technology). It was also the start of the Computer Age and I was substantially involved with designing computers and writing software. This lead me onto a dual path of electronics and software design ... all the while, still being interested in physics, music, arts and philosophy.

During my 40++ years of designing hardware and software for micro controllers and signal processors, I learned how to efficiently analyse systems, how to work out the essential components that make the system tick and how to find ways to model the system in hardware/software, in order to implement certain desired functionalities, read sensors and control actuators etc. This ability to analyse systems turned out to be a great skill in other areas of life ... and in particular, recently, in understanding life and the universe itself.

It always bugged me that physics did not provide any detailed answers as to "*how magnetism actually works*" or "*what makes electrons repel each other*" or "*how gravity works*" ... "*what a photon is*" ... and it also bugged me how physicists came up with unsightly concepts such as "*wave-particle duality*" and the likes.

I decided to dig a little bit ... and in the spirit of Richard Feynman, the triangulation method ... creating new knowledge by ***triangulating*** from existing knowledge ... I attempted to figure out what those photons and electrons are really all about.

To do this, one has to challenge (completely ignore) some existing "*opinions*" that are presented as "*irrefutable knowledge*", in particular the opinion that photons travel in empty space and ***not*** in a "*medium*" (whatever this medium is).

I came to the conclusion that the electron, the positron and the photon, are ultimately the key to understanding the universe ... together with the realisation that all particles are in essence ***electro-magnetic phenomena*** that interact with each other accordingly. And last, but not least, the realisation that the phenomena of gravity (curved space) naturally evolves just as an "*after thought*" of ***torsion in space*** ... no graviton needed.

The phenomena of gravity naturally evolves
as an after thought of torsion in space.

I realised soon too, that I don't really have the skills to provide solid mathematical proof of the concepts I developed during the "*journey of triangulation and discovery*", but I do have enough understanding of physics to feel reasonably confident in the outcome of this journey and the realisations arising from it.

2.0 Summary

By "*looking*" at the photon, we conclude that photons must be traveling in the electro-magnetic space (em-space) as *ripples*. Looking at the electron traveling in a vacuum or in a conductor, we conclude that moving electrons must operate via a similar mechanism to photons, in regards to the interaction with this space.

We further conclude that the circular magnetic field surrounding a moving electron must operate in a *elastic* kind of a fashion (torsion of em-space) and that a *linear action* of the electric field (moving electron) will cause a *rotary response* (circular) in the magnetic field ... and vice versa ... that a *rotary action/re-action* (induction) will be translated back into a *linear response* via a kind of a *toroidal geometry* surrounding the moving electron. We also conclude, that this linear action/response is *orthogonal* to the rotary action/response.

We show, that *torsion* of the em-space will result in an overall *compression* of this space and that in an overall compressed em-space, the wavelength (longitudinal size) of photons will shrink, relative to the uncompressed space (!) This could be interpreted as a *gravitational blue shift*, together with its counter part, the *gravitational red shift*. This compression of em-space together with the *gradient* of compression, will then lead to a *model of gravity* in general.

And further:

We present a electro-magnetic *model of an electron* (and of a positron).

We present a electro-magnetic *model of a photon* and its sub structure.

We propose a wave-photon duality between *non-photonic* and *photonic* radiation.

We propose the concept of a *anti-photon*.

We introduce the *drehon*, a charge carrier.

We introduce the concept of a *quantisation barrier*.

We demonstrate the interaction of a *surfing electron* with the em-space.

We explain why *gravity* (curved space) is in essence electro-magnetic and ...

We present the mechanism for a *gravitational lens* and for *gravity* itself.

We explain why *curved space is fundamental* to the creation of particles.

We postulate the general concept that a *linear action* in one type of e/m-field will produce a *rotary response* in the other type of e/m-field ... and a *rotary action* in one type of e/m-field will produce a *linear response* in the other type of e/m-field.

We further postulate that fundamentally, there are two types of "*particles*" at play, representing the fields on which *our space* (the space we experience) is build upon. We will call them *granules*. The two granule types are required to make the electro-magnetic phenomena work.

Each granule type is elastically coupled *within their type*, meaning, they can be compressed in certain ways (twisted or pushed) but together, they *may* also act like a semi liquid, a "*slow fluid*" of sorts and this fluid (em-space) *may* be dragged by gravitational objects. ('always good to keep an open mind, right ?)

The *e-granule* (electric) and the *m-granule* (magnetic) represent the *quanta* of the electro-magnetic quantum space (em-space). The two granules operate in a specifically prescribed way to allow for electro-magnetic phenomena (photons, electrons, positrons, protons, neutrons etc.) to exist and to propagate within this space ... the two types of granules are tightly coupled together, to make this work.

A *mechanism* exists to allow for a particular elastic motion (*rot, lin*) to store energy within the em-space and release this energy again loss less. The e-granules and the m-granules are operating together *as one* since a change in one type of granule *always* induces a corresponding change in the other type of granule. When one moves, the other one moves as well.

Energy that is being stored *within* the em-space via torsion, equals a certain amount of *mass* ... and this energy also results in a certain amount of *compression* of the em-space. This compression in turn would then give rise to gravity as will be explained later.

We also propose, that the e/m-granules are potentially two *different aspects* of one and the same "*particle*".

The e-granules and the m-granules form what could be referred to as *em-space*, *quantum-space* or *space-soup* and because the e/m-granules together also potentially act like a fluid, em-space itself could be seen as a fluid of granules of varying density.

If you then further consider that photons, electrons, protons and neutrons all predominantly operate in the em-space and together, they presumably are the constituents of most of *our information universe*, it would be reasonable to state that this quantum-space *is the space* we experience in our daily lives.

3.0 The Information Universe

As a consequence of the insights gained through the reasoning described in this book, I came to the following conclusion: The universe is not actually made of matter in the sense that there is a matter particle or actual matter that can be readily identified (!) In fact, the universe is a *information universe* only (!) At its foundation is what can be described as a *space soup* (quantum space) within which three dimensional *ripples* (photons, electrons, protons etc.) exist. In effect, *the ripples are the energy* that powers the universe and *they are the encoding mechanism* for the information universe (!)

The ripples exist in two basic forms: As traveling electro-magnetic disturbances which we call photons ... and as quasi standing wave type "*particles*" ... like electrons, positrons etc. which also interact with the space soup in a similar fashion to photons, since they too are just *ripples in space*.

Hence, standing wave particles can turn into photons (i.e. electron-positron annihilation) and photons can turn into (non-photon) particles and/or interact with particles (i.e. being absorbed or emitted by electrons ... kind of). Every particle has its anti-particle (standing wave phase reversal) except for the photon, which is said to be its own anti-particle (?)

Several levels of information exist:

- 0 Space soup (carrier of energy)
- 1 Ripples (photons) traveling at speed of light c .
- 2 Quasi standing waves (electrons, protons etc.) slower than speed of light.
- .
- 3 Atoms
- 4 Molecules
- 5 Crystals, metals etc.
- .
- . In-organic objects (Stars etc.) ... most of the universe (?)
- .
- m Primitive carbon based life (organic, self-replicating information)
- m+1 Plants
- m+2 Bacteria
- m+3 Insects, spiders etc.
- .
- n Advanced carbon based life (brain, knowledge/communication)
- n+1 Animals (no externally stored knowledge)
- n+2 Humans (use/generation/exchange of stored knowledge, speech, writing etc.)
- n+3 Culture (actual stored knowledge ... behavior, food, books, CDs etc.)
- .
- z other (?) i.e. higher conscious (?) god (?)

Since all particle interaction in the universe is based on probability, nothing in the information universe is truly pre-determined in the sense that any particular action has an exactly defined outcome that could be reversed (in thought at least) ... however ... the laws of physics will still execute in a predictable manner ... the earth goes around the sun ... the moon goes around the earth ... but the details are more "fuzzy".

Because of this fuzziness, when it comes to things like human thought for instance ... and the determination of ones own destiny ... things become even less pre-determined.

In particular, decisions that are "*critically un-clear*", as in "*could go one way or the other*" ... and which may result in very different outcomes (think Butterfly Effect) i.e. doing something as opposed to not doing it ... may **not** produce the exact same outcome when re-played, if one could re-wind the universe. Therefore, there is a strong argument for the existence of ***self determination*** for mankind.

This self determination of course hinges on the existence of ***true randomness*** in the universe ... the tiniest amount will do (!) In a universe that is based on probability, this minimal amount of true randomness is more ***likely to exist*** than not ... (proof me wrong :)

Nothing is truly pre-determined ... and
a re-run will most likely not produce the exact same outcome.

If there is such a thing as a ***higher conscious*** in the information universe ... and if this higher conscious interacts with the human mind and possibly extends toward infinity as in "*it keeps collecting/exchanging information*" ... maybe forever (?)

... then, this self determination of mankind could be influenced and/or guided by the influence of that higher conscious.

And further ... where would this higher conscious reside (?) In the ***collective minds of mankind*** (?) where each mind is somewhat connected to one another (?) Thinking on those lines would bring telepathy within reach ☺

Or would this higher conscious reside somewhere external and if so, what would be the encoding mechanism of this external entity (?) and how would it actually connect to the human (and non-human) mind (?)

... and if the brain is the tool/interface to connect to this higher conscious ... would this also enable any other creature with a human like brain to connect to this entity (?)

... and if this higher conscious is real and ***if*** it retains information from the past, then ***virtual time travel*** into this ***realm of the past*** could be conceivable ☺

Now, what is the probability of this higher conscious to *actually* exist ?

Well, there is little evidence to support it ... to my knowledge ... except a gut feeling of sorts maybe ... but there is no evidence to the contrary either. However, the fact that this higher conscious seems to be a logical conclusion arising from the information universe, makes you kind of wonder (!)

Another line of thought that arises out of the study of the information hierarchy:

Human life together with *human culture* are at the highest level of the information evolution that has been reached so far (dis-regarding the possibility of a higher conscious etc.)

When you consider human life to be a *carbon based life-form*, you could consider culture to be a *human based life-form* ...

... a life-form that is encoded in the collective minds of humans and we humans as a collective, *we are the care-taker* of this life-form.

When you further consider the law of self-preservation as a pre-requisite for life to exist, a universal force in the information universe ... as without self-preservation, life would ultimately cease to exist ...

and then add to that a sprinkle of self determination ...

it will become clear that we are the custodians of our culture and *we must keep our culture alive* ... as best as we can.

... Just thinking.

One afterthought though: (I couldn't help myself) looking at how everyone these days is somehow connected to the internet, via their keyboard/touchscreen and their audio-visual interfaces, this collection of connected human minds could almost be considered the

"collective minds of mankind ... where each mind is connected to one another"

... and be seen as an artificial form of this higher conscious, that is currently controlled by a *"higher power"* aka facebook, youtube, google etc. who are trying to control the *"collective minds"* of mankind via their algorithms and the tainted information they feed back to everyone, trying to make themselves the masters of mankind (?)

4.0 The Universe

According to Wikipedia ...

*... the universe is all of space and time and its content, including planets, stars, galaxies, and all other forms of matter and energy. The Big Bang theory is the **prevailing cosmological description** of the development of the universe. According to estimation of this theory, space and time emerged together 13.799 ± 0.021 billion years ago, and the universe has been expanding ever since ...*

Let's just call the universe *they* speak of, the **observable universe** that is made of "planets, stars, galaxies, and all other forms of matter and energy" and let's call the space *they* speak of, the **observable space** ... the space we can "see" ... kind of.

This of course implies that there is something called the **un**-observable space, the space within which the whole spectacle takes place, the ur-space if you like. The two, observable and **un**-observable space, are quite different (!) as I will explain in more detail later. But for now: The ur-space is where *we* (within our observable space) inherit the three dimensions from ... and where *we* inherit time and energy from.

As for the "expanding universe" ... this doesn't mean all space is expanding, it only means the distance between galaxies is getting bigger (the observable space ... kind of) ... not the ur-space itself (the **un**-observable space) ... and not mass itself (i.e. the earth doesn't get bigger). To make things even more confusing ... what **I** mean by "distance" is probably not what you think it means ... this would also require some more explaining.

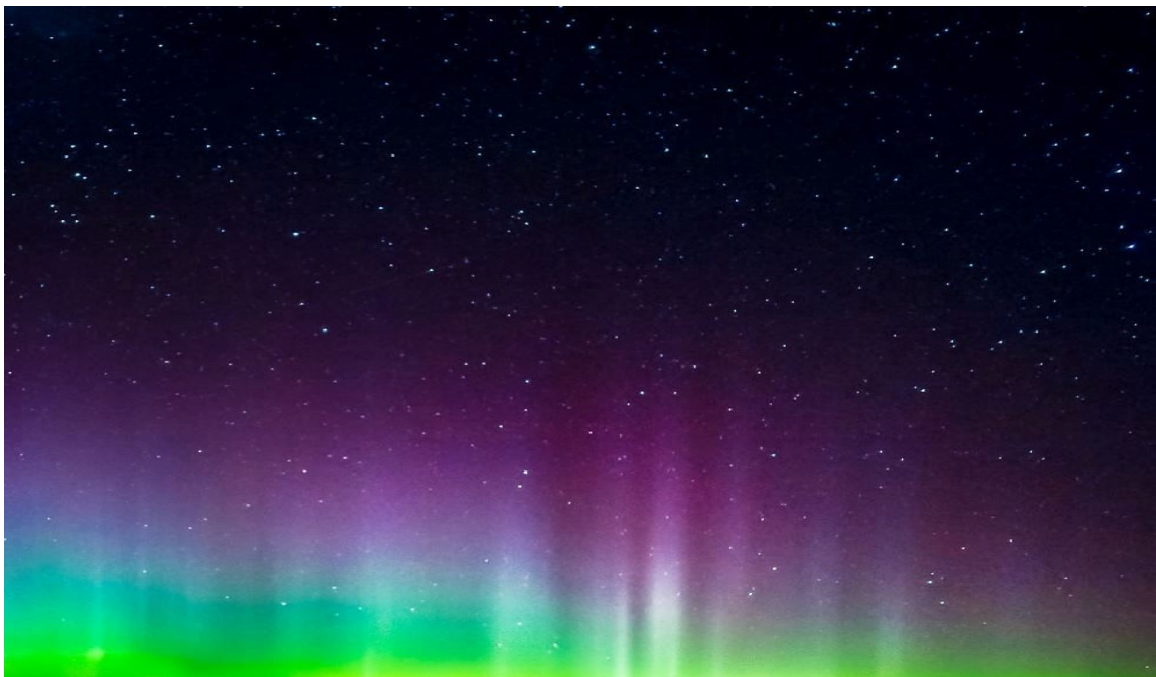
To the enquiring mind, several questions immediately pop up:

What is Space
What is Energy
What is Time
?

Our physical existence is strongly tied to the *energy* that ripples through *our space* and what we see/detect/measure are only secondary effects i.e. light traveling through this space. When we say light ... what we mean is:

electro-magnetic waves (photons) of *all* frequencies ...
electro-magnetic waves (ripples) = energy.

So, when it says in the Bible ... *let there be light* ... this is ultimately, coincidentally or not, the essence of *our universe* ... space ... light ... time ... and in that order.



Aurora Australis

Let us first look at some elementary particles like photons and electrons. When we say particles ... what we mean is: *electro-magnetic phenomena* that act like particles.

By looking at them and how they behave, we can draw conclusions as to what kind of mechanisms may cause their strange behavior i.e. red/blue shift of light, interaction of electrons with magnetic fields, particle annihilation, Lorenz force and so on.

Let's start our *journey of discovery* with some basic reasoning.

5.0 A Chain of Reasoning

For light (photons) to undergo a red/blue shift during emission means, light travels in a medium which we call *quantum space* and it travels through this space as an electro-magnetic *ripple*.

For electro-magnetic waves (photons) to propagate as a ripple in space, this space itself must be electro-magnetic in nature.

For electrons to absorb/emit photons and for electrons to turn into photons of equal energy (electron - positron annihilation) , the two (electron and photon) must be "*made*" and/or "*make use*" of the same "*stuff*".

For photons (and electrons) to travel *loss less* through electro-magnetic space, this em-space *must be quantised* and consequently, the ripples must not extend to infinity.

For visualisation purpose, we assume that this electro-magnetic quantum space is made of a minimum of two types of building blocks that are tightly coupled to each other: The *e-granule* (electric) and the *m-granule* (magnetic).

For *photon ripples* to travel *loss less* and in a *straight line* through em-space, this would require a special mechanism of interaction between the e-granules and the m-granules of the electro-magnetic quantum space.

A "*traveling electrons*" surrounding circular magnetic field (energy) gives us a clue as to what this special mechanism could be.

A loss less *twisting/recoil* action of this quantum space, together with magnetic induction would give us a model to "*allow*" photons (and electrons) to travel in a straight line through space: A *linear action* in one (e-space) turns into a *rotary response* in the other (m-space) and a *rotary action* in one (m-space) turns into a *linear response* in the other (e-space) again, for this model to work.

The *interplay* between the e-granules and the m-granules of this electro-magnetic quantum space defines the speed *c* at which photons travel, i.e. the "*time*" it takes to complete one wavelength ... $\epsilon_0 * \mu_0 = 1/c^2$... hence, time is a reflection of the speed at which processes in our universe unfold.

The *density* of this electro-magnetic quantum space defines the actual distance traveled (wavelength) of a particular photon, relative to a absolute point of reference. If quantum space is compressed, light will travel slower ... in relative terms.

Or in other words: Light in a compressed space will have a *shorter wavelength*, causing a gravitational *blue shift* when entering and a *red shift* when exiting this space.

We speculate that electro-magnetic quantum space is tightly coupled to *gravitational objects* and this may be the reason why an electron (i.e. on earth) can be accelerated in any direction in order to increase its mass/energy ... and then accelerated in the opposite direction (deceleration) to reverse this effect again (decrease mass/energy) ... and emit a photon during the deceleration phase (Brems-strahlung).

This may also be an *indication* that electro-magnetic quantum space is being (kind of) *dragged* by large gravitational objects (large mass) and hence, moving at (or nearly) the same speed/direction as the gravitational object (?)

There are two types of space: The em-space, that is the *distorted space* we experience via photons and other electro-magnetic phenomena, including time ... and the *ur-space*, the space in which *our em-space* is embedded ... the space from where we *inherit* actual space, actual time and energy.

And further ...

Inertia and *gravity* are fundamentally two different things (!)

Mass (energy) is implicated in *inertia* (dynamic) and *gravity* (static).

Mass (*m*) is energy (*E*) ... energy is mass: $m = E * (\epsilon_0 * \mu_0)$

Acceleration increases (electro-magnetic) *energy* ... hence it increases *mass*.

Mass inertia (i.e. electron) is coupled to e/m-granules via *induction*.

Gravity can be seen as a function of the electro-magnetic *space density gradient*.



Triangulum nebula

5.1 To elaborate on our Chain of Reasoning

It is essential for a deeper understanding of the proposed model, to accept that *light travels in a medium* ... whatever this medium is. Where in Quantum Field Theory, particles are treated as excited states of their underlying quantum fields, we go one step further and propose, that the (mathematical) quantum fields are *actually represented* by specific "*particles*", which we will call granules.

Based on the observation of moving electrons and positrons, we propose that the rotary magnetic field surrounding those moving particles, is based on *torsion* of the respective (elastic) field granules and we also propose that this torsion (together with tension) *is* the mechanism to store and retrieve energy in the em-space.

The idea of magnetic torsion is also supported by the observation of *Lorentz forces acting upon charged particles* ... i.e. it does not matter if the deflecting magnetic field is caused by a stationary magnet or a magnet that is rotating around its N-S axis, as the magnet in both cases only excites (twists) the *m-granules* of the magnetic *B*-field . (This is with the assumption that the rotation of the magnet does not cause any change in the intensity and/or alignment of the deflecting magnetic field).

Once you accept that magnetic torsion/tension *is the way* magnetism is communicated in space, it follows that *electrons* and *positrons* have opposite direction of torsion when, for example, traveling in the same direction parallel to each other ... i.e. one direction of torsion is anti-clockwise and the other one is clockwise. This again, we derive from the Lorentz force acting upon those particles.

From this we know, that m-granules can store energy via *RH-torsion* and *LH-torsion*, (clockwise/anti-clockwise), relative to a rest position (the unexcited field state) ... which then leads us to the *rotary magnetic aspect* of a *symmetric figure-8 photon model*.

The alternating *B*-field arising from this symmetric figure-8 photon model, is orthogonal to the direction of travel of the photon. This will be explained later.

Realising that the *E*-field can be represented via a solenoidal geometry (tension) and that a rotary action (magnetic) turns into a linear response (electric), this then leads us to the *linear electric aspect* of the symmetric figure-8 photon.

It can be shown that the *E-field vector* arising from this symmetric figure-8 photon model, is orthogonal to the *B-field vector* as well as orthogonal to the direction of travel of the photon.

5.2 The e/m-granules

For visualisation purpose, we assume that the electro-magnetic quantum space is "*made*" of a minimum of two types of building blocks that are tightly coupled to each other, the ***E***-elements and the ***B***-elements. Let's call them granules or, to be more specific, the ***e-granule*** (electric) and the ***m-granule*** (magnetic).

Space is filled with e-granules (e-space) and m-granules (m-space), like a compressible dense gas or liquid of sorts, together forming the em-space. The two types of granules co-exist in space superimposed and the granules interact with each other dynamically ... (***rot*** \sim ***lin*** and ***lin*** \sim ***rot***) ... the actual mechanism for this ***E/B*** interaction is unknown.

We visualise the e-granules as elastically coupled to each other ... the m-granules are also elastically coupled to each other. The granules must be "*springy*" to account for the torsion/tension/curl. Because of the elasticity of the granules, energy can be stored and released again within a collection of granules. No energy is stored when the granules are in a rest position.

No energy is stored when the granules are in a rest position.

We postulate the general concept that ... a linear action (***lin***) in one type of granules will produce a rotary response (***toroidal***) in the other type of granules ... and a rotary action (***rot***) in one type of granules will produce a linear response (***solenoidal***) in the other type of granules ... via a ***toroidal geometry***.

Because of the e/m-granules, you can have electro-magnetism without an actual charge (i.e. no electrons being involved !) A change in a ***B***-field will induce a change in the ***E***-field and vice versa. A linear displacement of one type of granules causes a rotary displacement of the other type ... and vice versa.

The whole phenomena of electro-magnetism and gravity
can simply be reduced to the e-granule and the m-granule.

5.3 Gravity and the Gravitational Lens

Gravity is caused by the distortion of the em-space *density*. For example, when a photon travels past the sun, near it's gravitational influence and with the em-space density gradient increasing towards the sun ... and say this photon is traveling in a straight line perpendicular to this density gradient at first ...

... the photon will undergo a blue-shift (shorter wavelength) as it enters this space of increased density ... but because of the density gradient, one side of the photon (the denser side) will travel *slower* relative to the less compressed space on the other side of the photon ... this speed imbalance will cause the photon to follow a curved path and "gravitate" towards the *denser* side of the gradient.

The speed imbalance is in fact a distance imbalance otherwise also known as curved space. As a result, a *net-influence* (force/gravity) will be exerted on the photon ripple and the photon will "gravitate" towards the sun. The same will also be valid for quasi standing wave particles like electrons, protons, neutrons etc. ... or any other massive object comprised of those quasi standing wave particles.

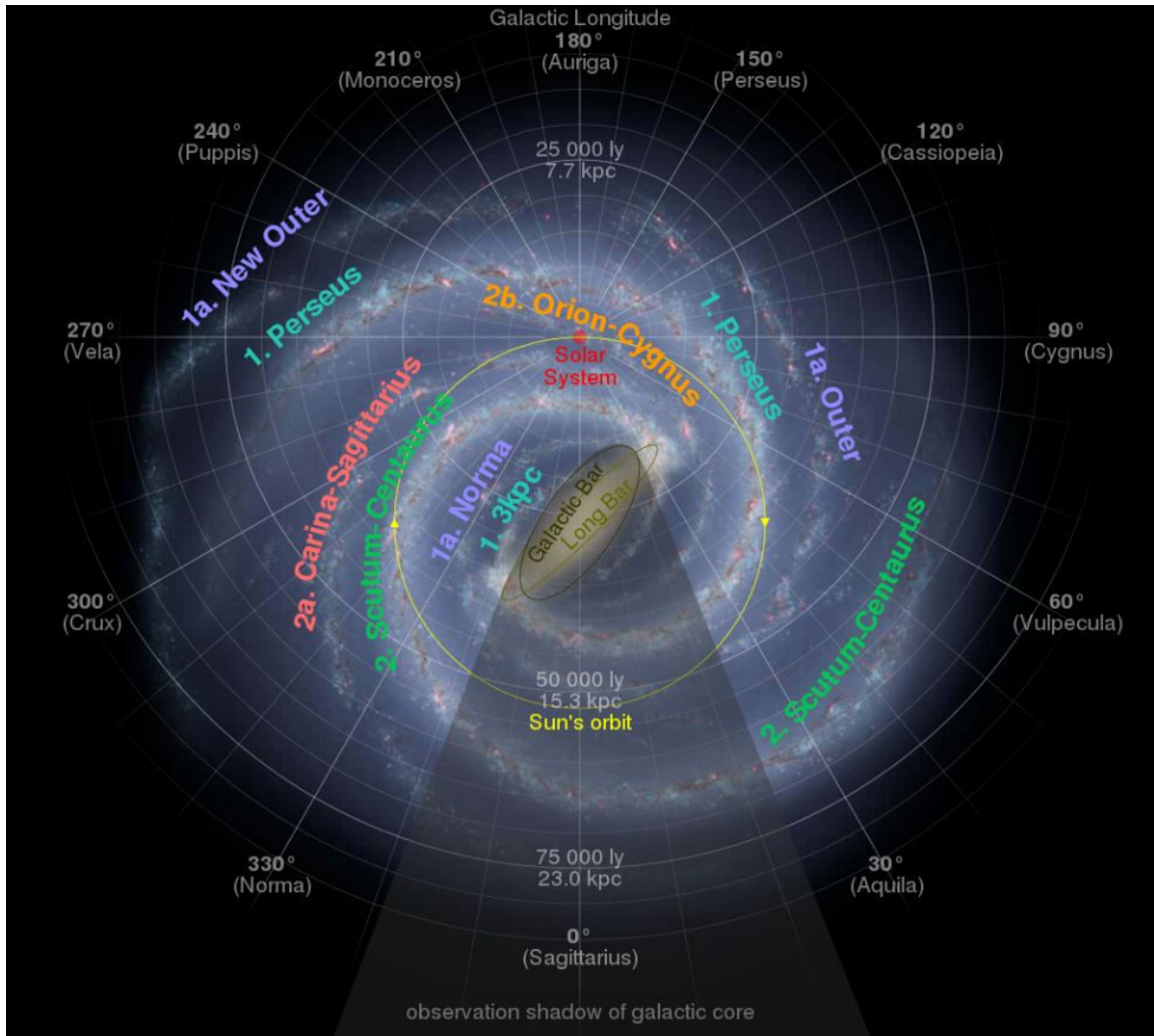


^
gravitational lens (NASA)

... some food for thought.

6.0 About Space

Not too long ago, the Milky Way was thought to be all there is in the universe ... until we figured out how to look further beyond our galaxy. But all that, what we can see of the far universe, is mostly an *image of the past* from millions of years ago.



Milky Way, NASA

To put this into perspective ... If *our* galaxy, the Milky Way, is 87,000 light years (ly) across its diameter, it would take you 43,000 years to travel from the outer edge to the center ... that is ... *at the speed of light* of ca 300,000 Km/s (!) ... and if you could *manage* to travel at ca. 10% of *c* it would take *you* almost half a million years to reach the center.

Our neighborhood (local group of galaxies) is ca. 10 million ly across ... or 5 million ly from the center to the edge of this local group. Looks a bit like *we are imprisoned* in this galaxy ☹ unless we find a clever way out.

One question that comes to mind would be: Is there something beyond this space (the space *we* experience) ... the *ur-space* if you like (?) And if this ur-space would allow information to travel at a significantly larger speed than the speed of light ... and in significant quantities ... (?)

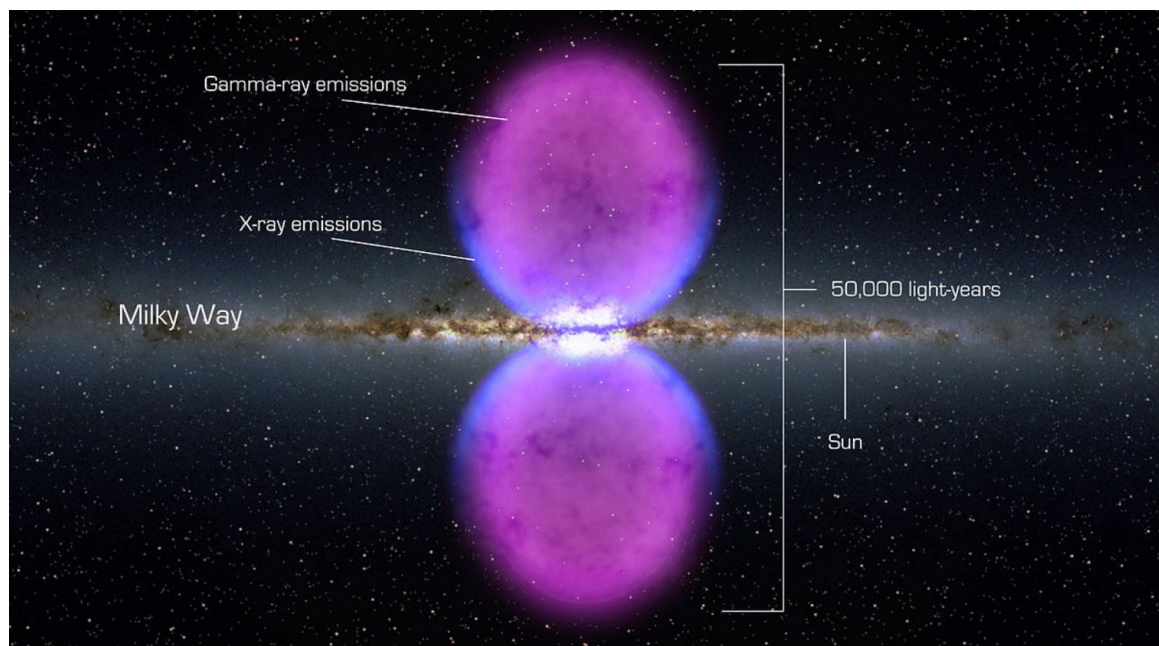
... would this enable us to somehow *bypass* the boundaries of our space (?)

In order to transfer information (i.e. a human being) into this ur-space, one would have to "*copy and paste*" a vast amount of information ... or maybe a destructive "*cut and paste*" would be easier (?) ... and then somehow navigate *within this ur-space* ... to arrive at another location in *our space* again (or somewhere else ?) ... and then transfer (translate) the information back again into protons, electrons etc. ... looks a bit like science-fiction for now.

6.1 A quick recap on Evolution

If the *observable universe* is ca 100 billion ly across, we can see up to 50 billion ly *into the past* (that is, if we consider us to be at the center of this universe). So, whatever we see in our "*space bubble*" beyond our local group of galaxies, is pretty much old news ... more than 5 *million* years old ... but less than 50 *billion* years old.

To compare this to life on earth: Oxygen producing life showed up on earth ca 2.5 billion years ago. The evolutionary period from apes to humans spans ca. 10 million years. Humans (*homo habilis*) started to evolve on the earth ca 2 million years ago and Neanderthals (*Homo sapiens neanderthalensis*) ca 0.35 million years ago.



Milky Way, NASA

To get a better understanding of what space is, naturally, the first port of call would be the Milky Way of course ... but, let's put *the past* aside for now and let us look at *the present* ... to do that, you may want to focus your attention onto the world of electrons, positrons and photons.

The sizes here are equally daunting ... only on a smaller scale. Just 1 L of liquid water contains ~ 34 Septillion H₂O molecules (3.3455×10^{25}), that's 34 Trillion * Trillion (!)

The size of a single *oxygen atom* is ~ 1.14 Ångström (0.114 nm)

The size of a *hydrogen atom* is ~ 1.06 Ångström (0.106 nm)

The size of a *hydrogen nucleus* (proton) is ca. 0.0000017 nm

The *size of an electron* (wavelength at 51 GeV) is said to be ~ 0.000000024 nm

The *relative size* of the hydrogen atom is approximately **60,000 times** its nucleus (!)

Blue light (375-460 nm) and *red light* (550-700 nm)
has just the right amount of energy to excite the
electrons involved in photosynthesis.

If a electron and a positron annihilate (at rest)
each of the resulting *gamma rays* has an energy of approximately **511 keV**
and a frequency of ~ 1.24×10^{20} Hz, resulting in a
wavelength of ~ 0.00241768 nm (2.41768×10^{-12} m)

Compare all this to the *plank-length* of $\ell_p = 1.616255 \times 10^{-35}$ m ,
presumed to be the smallest measurable distance.

On a side note: Just the diameter of a hydrogen atom vs. the diameter of its nucleus (0.106 nm / 0.0000017 nm) is greater than 60,000 (!)

Hence, most of the "*empty*" space of a hydrogen atom is occupied by the electron, a quasi standing electro-magnetic wave (a photon), enveloped by an associated electro-magnetic ripple surrounding this "*photon*" ... and both ripples moving *together* at a particular speed around the hydrogen core, constituting some kind of electro-magnetic *charge cloud* (statistically speaking), permeating nearly all of the volume of the hydrogen atom.

Or in a more generalised form: This photon ripple embedded within another ripple of associated electro-magnetic energy, whizzing around a relatively tiny nucleus and forming this *photonic energy cloud* ... this is essentially what *we* are made of ... light.

So, when we *touch* something, we mostly "*interact*" with this photonic energy cloud and even though it "*feels*" like it's made of something more "*solid*" ... it is not.

Let that sink in for a while ...

6.2 Absolute and Relative Space

Our space, the space we experience, consists (presumably mostly) of the electro-magnetic space (em-space). Without energy present, this space has no meaning ... time and gravity do not exist ... there is no information (!)

A space "*bubble*" without energy is like a computer without software ... no operating system, no BIOS, nada. Except for maybe the elementary laws of physics, everything else is kind of self learning ... trial and error ... just put in some energy and wait.

Our em-space without energy has no meaning,
without energy, time and gravity do not exist.

Once you look at em-space as being comprised of various types of granules, there must be another space ... the ur-space ... within which our space exists. This ur-space itself is *not* made of e/m-granules and photons etc. but it provides the constituents and the energy for our space to exist. In this ur-space, other (em) space-bubbles could exist ... some with *opposite phase* ... majority positrons instead of electrons (?)

The *Big Bang* event (if it ever happened) could be considered as *the injection event* of random energy into our space bubble, originating from the ur-space somehow. Out of this random energy, a bias seed towards electrons, protons etc. evolved and the information flipped towards one of the two possible phases, *electron vs. positron*, the electron won (!)

For example: When you have an a-stable (upside-down) pendulum and if this pendulum is in perfect balance initially, it will integrate all the random forces (noise) acting upon it and remain in the UP position (balanced electron-positron annihilation). But within the random (presumably white) noise, there will be some frequency components on the lower end of the noise spectrum, that will eventually form a minute and temporary bias around the *point of stability*. This bias will eventually be the seed for the pendulum to move in one of the two possible directions (more electrons or more positrons). Once the seed is in place, i.e. majority electrons, any new positrons will be annihilated and electrons will dominate. This bias of course relies on a *majority advantage* mechanism ... in this example, the mechanism is gravity.

At the border between two adjacent and *out of phase* (opposite phase) em-space bubbles, particle/anti-particle annihilate each other increasingly until there is a *dead-zone* of particle/anti-particle pairs where mostly only photons, drehons and the like exist. Spaces of *equal phase* and adjacent to each other, would likely merge to form a bigger space of equal phase.

The ur-space contains all the e/m-granules (plus more ?) and provides us, through the e/m-granules, with the three dimensions as we know it. The ur-space therefore could be seen as *absolute space* within which information is created and destroyed via the flow of energy.

Our relative em-space, our universe, the space we experience, is in effect an illusion, since *our experience* in it is largely dependent on the density of the e/m-granules and the processes unfolding within this space soup. Em-space could well be seen as a 4th dimension that is embedded within the 3 dimensions of the ur-space ... we can NOT experience the ur-space itself, but only the ripples (photons etc.) within *our* em-space.

6.3 About Space Density of em-space

There is no reason to believe that "*energy containing em-space*" is homogenous in density or that it is stationary (not flowing). When you have a lot of quasi standing wave particles (energy/mass) moving around within a particular region of em-space, you have a lot of twisting (torsion) of the e/m-granules within that region. This twisting is akin to a *localised compression* of the em-space.

When you have a lot of *compressed points* within a region of em-space, you will consequently have a lot of *relative voids* in between the compressed points (on average) and the compressed points will move closer together.

This will result in the em-space over all becoming denser and more compressed within that region. As a consequence, a photon ripple traveling through that region will undergo a *blue shift* and will slow down (relative to a uncompressed region of em-space).

Our em-space *may* also be tightly coupled to "*gravitational objects*" (i.e. the earth) and hence, being dragged by those objects. Maybe this is why electrons on earth can be accelerated in any direction to increase their mass/energy ... and decelerate in the opposite direction again to reverse this effect (decrease their mass/energy and emit a photon). Our space would then become *relative space* around gravitational objects.

Our space is electro-magnetic.

Our space is elastic.

Our space varies in density.

Energy is stored in this space via *torsion* and *tension*.

Ourspace is relative in nature.

Our space *could be* seen as a fluid.

Our space *could be* dragged by gravitational objects.

Our Time, the speed at which processes unfold, is a property of our space .

7.0 What is Time

Time as we experience it, is nothing but an illusion. Time is the speed at which processes in *our* universe unfold and consequently, time is a property of this space ... or to be more precise ... *our* space, the space as *we* experience it.

Time is the speed at which processes in our universe unfold.

There are two primary processes:

- 1) The speed at which processes unfold in our universe: On a small scale, particles, atoms, molecules, DNA etc. all interacting with each other, i.e. the speed at which we age as human beings ... and on a larger scale, the stars, planets etc. doing "*their*" thing.
- 2) The speed c at which electro-magnetic ripples (photons) migrate through space.

However, there are two kinds of space ... (a) the non-homogenous space that *we* experience, namely the *electro-magnetic space* or em-space in short, where photons exist in the form of electro-magnetic ripples, and ... (b) the space where we inherit the three dimensions from, the *ur-space* if you like, for lack of a better word.

The photons ... the electro-magnetic ripples in space ... or "*light*" to keep it simple, those ripples (being light) propagate at the speed of light of course ... either in a straight line (radiation, sunshine) or as a localised *quasi standing wave* (electron, positron etc.), still rippling at the speed of light ... and getting nowhere fast.

The photon ripples are the key to creating the illusion of time ... time t being the property of this electro-magnetic space. The speed of light c that we are talking about, is defined by the superimposed properties of the *electric* field ϵ_0 and the *magnetic* field μ_0 of the electro-magnetic space.

Since speed is distance per unit of time (meter/seconds or Km/h) the inverse of speed is a *representation of time* itself (seconds per unit of distance traveled).

$$1 / c = (\epsilon_0 * \mu_0)^{1/2} \text{ [s/m]}$$

But, because the space *we* experience is non homogenous, meaning, it varies in *density* depending on *mass/energy* contained within this electro-magnetic space at a particular location ... distance is something that can kind of vary between two given points (i.e. between point $x0$ and point $x1$, with both points referenced to *absolute space*, aka the ur-space ... or alternatively, referenced to the *un-compressed* em-space).

$$m = E * \epsilon0 * \mu0$$

If you look at the same two points $x0$ and $x1$ in the electro-magnetic space, the "actual distance" a photon travels through this space (number of ripples) from $x0$ to $x1$, is a function of density of the electro-magnetic space *in between* the two points. If the em-space density increases, the distance between $x0$ and $x1$ also increases.

If you wanted to be clever, you could define a new property of space and call it nominal distance $d0$ at a particular location x,y,z ... and use this to describe time at this particular location in space as $t(x,y,z) = d0(x,y,z) * (\epsilon0 * \mu0)^{1/2}$ or simply:

$$t = d0 * (\epsilon0 * \mu0)^{1/2} \text{ [s]}$$

The thing to keep in mind is: The value t represents the time for a photon (in vacuum) to travel along a particular *nominal* distance in the electro-magnetic space... here on earth this distance would be 1 meter.

With $\epsilon0 = 8.8541878128E-12$	[some particular magic units]
and $\mu0 = 1.2566370614E-06$	[some other magic units]
and $d0 = 1.0$	[m]

$t = 3.3356409510 \text{ ns}$	[in ns/m if divided by $d0$]
$t^{-1} = 299,792,458.09$	[in m/s (speed of light) if multiplied with $d0$]

So, if the electro-magnetic space density increases (i.e. gravitational field), the nominal distance also increases and time seems to slow down (gravitational time dilation) ... more ripples (electro-magnetic "oscillations" of the photon in space, along the axis of travel) are required to cover the "actual distance" from $x0$ to $x1$ (as referenced to absolute space) ... it takes longer.

What this also means is, the wavelength of the photon will shorten and undergo a blue shift, when the photon enters space with increasing density.

But wait ... there is more (!) The speed at which processes in our universe unfold is also influenced by the amount of linear acceleration a particular system (i.e. a human being) has experienced ... by the amount of additional energy that has been "*pumped*" into the system. Remember ... increase in energy equals increase in mass. Larger mass results in slower process speed (i.e. pendulum).

An example: A (spring-mass) pendulum **P2** with a larger mass, will oscillate at a lower frequency **f2** (slower) compared to a similar pendulum **P1** with smaller mass, oscillating at a frequency of **f1** (faster). To complete i.e. 10 oscillations will take longer for the heavier pendulum **P2** as compared to the lighter pendulum **P1** ...

However: If we put the lighter pendulum **P1** inside a rocket and accelerate the rocket in one (any) direction, the mass of **P1** will increase. The energy "*pumped*" into the smaller mass of pendulum **P1** during acceleration, will add to it's existing mass ($m = E * \epsilon_0 * \mu_0$) until it eventually reaches and exceeds the mass of the pendulum **P2**. Consequently, it will also oscillate at a lower frequency, eventually equal to **f2** and even lower, if acceleration continues in the same direction.

Biological processes work in a similar fashion ... given enough acceleration, the mass will increase and the processes (biological clock) will slow down ... time/decay will slow down. A man in a rocket, that has gone through a significant acceleration/deceleration phase, will be a little bit "*younger*" than his twin brother back on earth, when they meet again ... The watch he was wearing will tell him, by how much.

On reflection, all of the above doesn't really explain what time actually is ... it just makes it clear that time (and space) are more like a mirage to us, as we experience it. However, it also makes it pretty clear that, just like space, we must be inheriting time from somewhere ... the same as we inherit space from somewhere ... we could call this inherited time the **ur-time** ... with ur-space, ur-time and energy being the mother of all existence ... electro-magnetic or other.

I can already hear "*the critics*" lamenting ... How do you know all this ... where do you get the crazy idea from, that "*space varies in density*" ... and what do you mean "*space is electro-magnetic*" ... but Einstein said ... aaand so on.

Well, once you understand/realise what a photon actually is, this understanding leads you directly to a model of the electron and the positron. This will further lead to an understanding of electron-inertia (inductance), explain magnetism, energy-mass equivalency, gravity and it kind of fans out from there. You soon realise that photons are at the heart of it all.

8.0 The Electron

The Electron is a *stable elementary particle* .

It has a *rest mass* of $0.51099895000(15) \text{ MeV}/c^2$
and a *net charge* of $1 e$ or $-1.602176634 \times 10^{-19} \text{ C}$.

It has a *magnetic momentum* of $-1.00115965218091(26) \mu\text{B}$.

A Electron has *spin* (angular momentum) of $\frac{1}{2}$.

Electrons can "*emit or absorb energy*" in the form of photons.

A Electron has a corresponding Anti-particle, the Positron.

Electron - Positron annihilation emits Photons.

So, the electron has mass, "*negative charge*" Q_e and magnetic momentum ... one could assume, it is some kind of an electro-magnetic *device*. The Anti-particle of the electron, the positron, is presumably identical to the electron (same spin of $\frac{1}{2}$), except that it appears to have a "*positive charge*" and the magnetic field generated when moving through space is in effect a mirror image of the electron's magnetic field.

When an electron and a positron annihilate at low energy levels (low collision speed), we observe two photons that emanate from the point of annihilation at 180 degrees to each other. The total energy of the two photons is equal to the total energy of the electron and the positron.

Would it be reasonable to assume, an electron is some kind of a "*quasi standing electro-magnetic wave*" of some sort, with the "*inner electric field*" being the *positive phase* ($+q$) of the electric field oscillation of a photon, confined to the center of the electron, and the "*outer electric field*" being the *negative phase* ($-q$) of the electric field oscillation of this photon (?)

The electron would then function as some kind of a "*dipole*" with the positive end of the dipole at the center of the electron being shielded/hidden to some degree by the negative phase that surrounds the electron core. The *imbalance* of the two fields, as it appears from the outside, would then be equal to the "*electron charge*" Q_e .

The magnetic aspect of the quasi standing wave photon, being represented by a "*particular geometry*" (spherical/toroidal/other), would then be acting like a trap to the photon. This kind of "*electro-magnetic trap*" could then also account for some or all of the magnetic momentum of the electron.

The same logic (of all of the above) could also be applied to the positron, but with opposite phases: **negative** electric field phase ($-q$) on the **inside** of the positron and **positive** electric field phase ($+q$) on the **outside** of the positron etc. ... and equal spin.

What is interesting is: The "*electron*" can absorb energy in form of a photon and/or emit photon energy ... i.e. when a high velocity electron beam hits a metallic surface and the electron speed is suddenly reduced (deceleration), photons are emitted (Brems-stahlung). When electrons bound to an Atom absorb a photon, their **energy level** is increased (speed) and their trajectory around the nucleus changes ... after (or during) release of a/the photon, they bounce back to a lower energy/speed trajectory again.

The "*storage mechanism*" for this added energy is linked to the electron velocity via a electro-magnetic field **surrounding** the moving electric charges (!) and not to the energy of the "*quasi standing electro-magnetic wave*". The total moving charge of the electron being composed of the **positive phase** $+q$ of the photon (on the inside) and the **negative phase** $-q$ of the photon (on the outside), the total moving charge being greater than Q_e (!)

In **beta decay** (β -decay), a beta particle (*electron* or *positron*) is emitted from an atomic **nucleus**, transforming the original nuclide to an isobar of that nuclide.

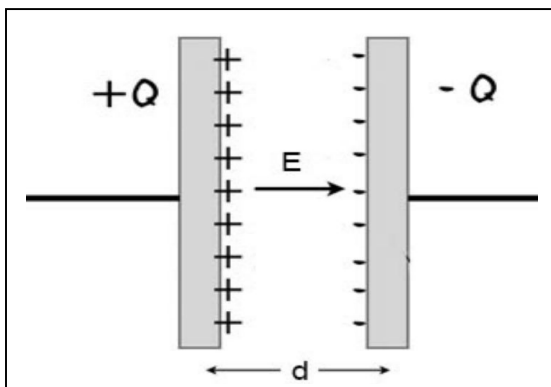
In **beta minus** (β^-) decay, a **neutron is converted to a proton**, and the process creates an **electron** and a electron antineutrino.

In **beta plus** (β^+) decay, a **proton is converted to a neutron** and the process creates a **positron** and a electron neutrino.

In **electron capture**, a electron is **captured by a proton** in the nucleus, the **proton is converted to a neutron**, a electron neutrino is released.

8.1 The Electron - electric field

Two stationary electrons repel each other because they have both (what we refer to as) "*negative electric charge*".



For example, let's visualise a high voltage capacitor made of two metal plates, the size of an A4 sheet and opposing each other at a distance d of a few cm. When charging up this HV capacitor to say 10,000V, one of the two plates holds a "*surplus*" ($-Q$) of electrons and the other plate has a opposing positive charge ($+Q$). The two plates are in a "*electrically balanced*" state. They hold a "*static*" electric charge.

If for example, the negative side of this capacitor is then moved further away from the opposing plate, the apparent voltage across the plates will increase, as the "*electron pressure*" inside the negative plate increases (because of the electrons repelling each other and now being further away from the "*holding*" influence of the positive plate).

A small conductive ball (i.e. made of aluminum foil) held by a non-conductive string, can be used to visualise this charge. When suspended between the two charged plates, it will first move towards the positive plate and drop off an initial amount of free electrons present in the aluminum ball ... now being "*positively charged*", it will move towards the negative plate and on contact, it will pick up electrons and relieve some of the electron pressure in the negative plate ... it will then be repelled by the negative plate, as well as being attracted by the positive plate again ... and, when making contact there, it will drop off the load ... and so on ... until (simplified) equilibrium of charge occurs.

If you connect a "*insulated electrical wire*" to the negative plate of the capacitor, the electron pressure would fill up the wire with electrons until equilibrium of charge between the two conductors (wire/plate) occurs ... the "*electricity*" (electron pressure) is now available at the other end of the wire for further use (discharge of plate).

Any removal of electrons on the open end of the wire, would cause an almost immediate "*refill*" on the other side (plate). A continuous discharge (electric current) would cause the electrons to flow at a relatively slow speed through the wire.

If you were to disconnect the wire again (without discharge of plate), some of the electron "*surplus*" would remain within the wire (like with the aluminum ball) and could then be discharged on the positive plate.

In summary, the capacitor is a (static) accumulating device for the electric charge of the electrons. If no leakage were present, the charge would remain on/in the plates of the capacitor indefinitely ... or in other words: The electron is a "*carrier*" of static electric charge ... statistically speaking ... even though, each electron is a "*oscillating*" quasi standing wave.

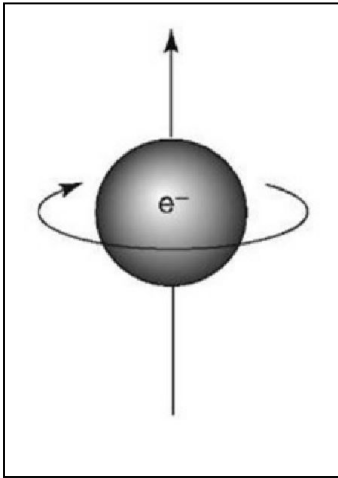
Proton - Anti-proton annihilation produces photons, electrons, positrons and neutrinos.

Quark - Anti-quark annihilation produces two photons and can be observed in ***π^0 decay***.

A ***neutron*** (two down quarks and an up quark) decays to a ***proton*** (a down quark and two up quarks).

Anti-protons can annihilate with ***neutrons***, and likewise ... ***anti-neutrons*** can annihilate with ***protons***.

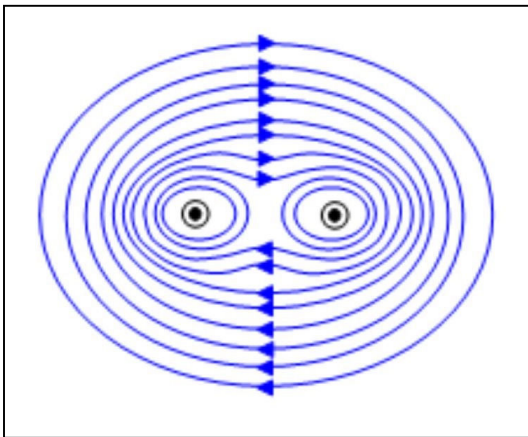
8.2 The Electron - magnetic field



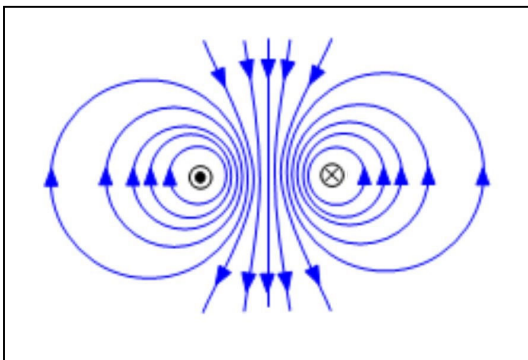
When electrons travel (i.e. in space or in a conductor) they are surrounded by a **circular** magnetic field (**-rot**) ... For instance: If the electron is moving away from an observer, a **anti-clockwise** magnetic field can be observed ... subject to interpretation (!)

The rotating (twisting) magnetic field of the **moving** electron could simply be imagined as a "**rotating disk**", with the electron spin vector pointing (orthogonal) away from the center of that disk towards the direction of travel ... a bit like a "**sideways spinning top**" ... The actual direction (forwards/backwards/clockwise etc.) are all a matter of convention ... see **right hand rule** etc. for more info on that.

When **two** electrons travel next to each other, both create a **anti-clockwise** magnetic field. The magnetic fields combine and seem to cause the electrons to be "**attracted**" to each other. This of course will be opposed by the "**electro-static**" repelling force to some degree.



In two solid conductors, parallel to each other and both carrying **significant** electron current **in the same direction**, the attractive force can be so strong as to actually bend the conductors towards each other. The "**magnetic action**" (for lack of a better word) **in between** the two parallel conductors seems to cancel each other out (or maybe being re-directed ?) and instead, the magnetic "**flow**" appears to combine and go **around** the two (or more) conductors and **push** them towards each other.

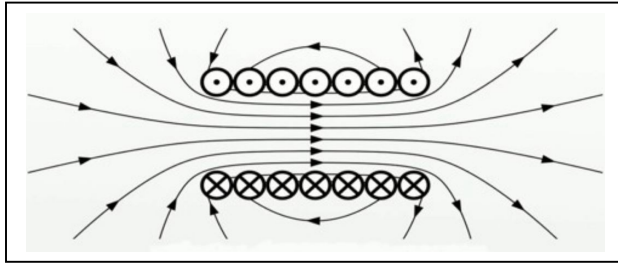


If however, two electrons travel in the **opposite** direction to each other, they have opposing magnetic fields, one clockwise and the other anti-clockwise.

This will cause a **repelling** force between the two electrons ... i.e. opposing currents in two parallel conductors will **push** the conductors away from each other.

When a *electron* and a *positron* travel next to each other, both create a *opposing* magnetic field (figure-8) ... similar to the previous example except, both travel in the same direction ... the magnetic field causes the two to repel each other, whilst being attracted to each other by the "*electro-static*" force of the two *opposite charges* pos/neg.

Looking at a coil of wires (i.e. a long solenoid) all the windings next to each other along the length of the coil will have current flowing in the same direction and combine their magnetic action to form one strong magnetic flow that is ultimately focused along the



Solenoidal field of a long coil (technical current).

linear inner axis inside of the solenoid coil and (depending on the direction of the current) going in a forward or backward direction through the solenoid core ... exiting on one side of the inner axis and *looping back* to the other side of the inner axis ... or vice versa.

One thing to note is: The electric field (movement of electrons) is *orthogonal* to the magnetic field overall (including the inner axis of the solenoid) ... or in other words: When you draw a vector representing the electron flow and another vector representing the magnetic flow inside the solenoid, the two are at a *right angle* to each other.

The linear inner axis (*lin*) exhibits elastic magnetic *tension* along its length, caused by the magnetic *torsion* (*rot*) on either end of the solenoid. The magnetic *torsion* on one side of the solenoid forces magnetic field lines (m-granules) into the core and by doing so, it increases the *density* around the pole and inside the solenoid core. A similar process happens on the other pole, but in reverse.

The linear tension *inside* the solenoid core is in the *opposite direction* to the linear tension *outside* of the solenoid (parallel to the core). The m-granules outside the solenoid are also more spread out, meaning they are not as dense as on the inside. Makes sense, since the area (cross cut) of magnetic "*flow*" is larger on the outside than on the inside.

The magnetic *B*-field itself does not actually have a beginning or an end because it is a *circular field* (rotational) in contrast to the electrical *E*-field (i.e. capacitor) that has 2 clearly defined poles that can be moved relative to each other.

What we call *south* and *north* in a magnet is misleading in the sense that it implies two separate entities when in fact, it only indicates where the rotating (imaginary) field lines enter or exit something and we don't even know in which direction they actually rotate.

What we do know is, *no one* has ever observed a magnetic south-pole by itself or a magnetic north-pole by itself ... because they are always part of a closed circle. That is *not* to say, they can't exist though (!)

The *magnetic poles* (N and S) on either end of the solenoid, exhibit equal *density* but with *opposite torsion* (direction of twisting) ... if you would put two of those electric magnets next to each other, they would either *repel* each other (N/N and S/S) or they would be *pushed towards* each other (N/S and S/N).

When *equal poles* meet, the density of the m-granules between the two *equal* poles increases. As the poles are pushed more and more towards each other, they resist ... or in other words, this causes a *density imbalance* on each of the magnets opposing poles, that in turn results in a *repelling* force.

When *opposite poles* meet, the opposing torsion will equalise and the *tension* of the two *inner axis* will (kind of) connect, having equal direction of "*magnetic flow*" and again, this causes a density *imbalance* on each of the magnets opposing poles and this seemingly results in a "*attracting*" force ... but in fact, the magnets are being *pushed together* by the unaffected (un-equalised) poles on the far ends.

One *interesting aspect* of all of this is: There seems to be some kind of *inertia* involved with the "*magnetic action*" ... especially in coils of wire ... when we drive a pulsed current through a coil (i.e. by applying a square wave voltage to it), we experience what is called *kick-back*. Initially, the magnetic field *resists* an increase in flux, similar to a mass resisting acceleration ... once the magnetic action is going, it just wants to *keep going* (a bit like a flywheel) and then ... when suddenly disconnected ... potentially creating thousands of volts of kick-back voltage in the process (volts = pressure) .

In other words: When accelerating an electron, energy is required to build up the magnetic field surrounding the electron, which in turn stabilises the speed/movement of the electron. This *electron inertia* reminds me a bit of the *inertia of mass* ... is there a link (?) I wonder ... in fact, I'm sure there is. We make use of this "*inertia effect*" in modern switch mode power supplies.

When switching relays with semiconductors, we use *flyback diodes* do stop the very high kick back voltage from occurring, by providing a path for the electrons to continue to move (flow) until the magnetic energy dissipates (as heat) and the electrons eventually stop flowing inside the coil of the relay (dissipation of energy due to resistance of the wires).

Electron acceleration/deceleration experiences inertia via the *magnetic action* .

The magnetic field acts like a *speed stabiliser* to the electron.

The magnetic field does *not* drain energy from the electron.