BEYOND SUPERSTRINGS

The Origin of Electric Charge and Magnetic Spin

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Calculations: All Calculations in Mathematica 11.0 have been printed in a PDF File
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Preface

The Light we see in our daily world has a hidden key which has the power to open doors that have never been opened before.

When we go back in time, the time before Albert Einstein published in 1905 his theory of Relativity. When we go back in time, the time before James Clerk Maxwell published in 1865 his theory of Electrodynamics. When we go back to the time of Newton, the last Magician of his kind, when he published in 1687 the “Philosophiae Naturalis Principia Mathematica”.

Then we find hidden, behind the 3 famous laws of Newton, an unknown new theory of light which shows us the secrets of light. The secret that light has the power to confine itself within dimensions a billion times smaller than the dimensions of Superstrings. An unknown dimension, creating an unknown world with the size a billion times smaller than the dimensions of Planck's length.

In this book a new theory will be presented which offers answers at dimensions smaller than Planck’s length and smaller than the dimensions of “Superstrings”.

To find this theory we have to find back a lost path in History. To find back the fundaments of ”Gravitational-Electromagnetic Confinement” which reveals the secrets of light which will take us beyond Relativity and which will describe the interaction between gravity and light in a different way than in General Relativity. A theory that will not be build on existing theories but a theory which will offer new roads to new discoveries and which will reach further beyond “Superstrings” than the roads which already do exist.
To find back the “Holy Grail” of light, the Grail which connects the unseen world with the world we see and experience, the Grail which connects the world before we were born with our daily light, the Grail which reveals that our universe is the inside of a Gigantic Black Hole, the Grail that shows us that we observe on earth the Universe in a very different way than how the Universe really is, the Grail which connects the outer boundaries of our universe with the smallest dimensions inside the “superstrings”. The Grail which is limitless because the limits are the boundaries of our dreams, the boundaries of our imagination.

To find the “Holy Grail of Light” we have to go back in time. It will not be found in the modern world of particles and probability waves. We have to go back in the time before “Albert Einstein” and “Niels Bohr”. The time when the decision about the future physics had been made at the 1927 Solvay Conference. We have to go back in the time before James Clerk Maxwell, before his theory of Electrodynamics. We have to go back to the time of Isaac Newton who has been called the last magician of his time.

And on the mathematical foundations, built by Isaac Newton and those before him, this new theory will be build which will reveal the hidden secrets of light. The secrets of Gravitational-Electromagnetic Confinement. And this knowledge will offer the possibilities to go beyond the outer boundaries of our universe and to go to the world beyond “Superstrings”.

This is a non-fiction book. And that means this is not a book where during the whole book will be spoken about the “Holy Grail” and then finally it will end with one or another weird metaphor. This book is real. And the results are real. And the “Holy Grail of Light” will be presented in one
single equation (5) (without gravity) or one single equation (5-a) (gravity included).

I have published two versions of my last book which contains much of the work already done to come to the results in this book.

1) The Religious Version: “The World Beyond Superstrings”. This book has been written for the Atheists. For the non-believers. For those who do not believe in God, in Allah, in Elohim. For those who do not believe in YHWH. For those who do not believe that there is a life after death or there was a life before death. For those who do not believe in the human soul that will survive every death. For those who do not believe in evil. I have written for you a special book. Because you are special. Because I do believe that you are so much more than you think you are. You do not want to live in a world filled with lies, fear and fairy tales. And that is because you are a warrior. And the warrior does not sleep in the same dormitory where the enemy sleeps. Because he knows that the enemy will destroy him in the deepest hour of his sleep when he is weak and defenseless. You are the army that will rise when the darkness falls over the earth. You will become the soldiers on the battlegrounds when the war has come. The war between Light and Darkness. The war between Good and Evil. The war between Love and Hate. I will speak to you rough and without mercy. Because you are asleep in the dormitories of your soul and you do not see that
your dormitory is already on fire. Yes I am ringing the alarm bells in the middle of the darkest hour of the night and will make every sound that I can, to wake you up from your deep sleep and tell you that the armies of darkness are coming. The Army of Darkness will come like a thief in the darkest hour of the night.

2) The non-Religious version: “The Particle Wave Mass Unification” which only contains the mathematical part of my book. This book has been written for them who have found YHWH already and I do not have to speak to them in words they already know.

BEYOND SUPERSTRINGS

The full text is available in PDF format
https://osf.io/mv35q

1 Introduction

The world beyond Superstrings describes a world with dimensions smaller than Planck length (1.616229 x 10^{-35} [m]). Since 1971 Superstrings within the dimensions of the Planck length have been considered the building elements for elementary particles. The question rises: What are Superstrings made of? What is the building material for
Superstrings. What are the 10 dimensions? This book offers an attempt to find new answers beyond unknown borders.

To find the new unknown boundaries we have to go back in time. Because when we start with the same mathematical equations, the same knowledge, the same procedures, we will always find the same outcome, the same answers. And soon we will believe that there is only one outcome. The only outcome within the Standard Model where we will find the same elementary particles grounded on the same Superstring Theory.

To escape from the vicious circle in Quantum Mechanics, we have to leave the path of well known physics. We have to leave behind the founders of Quantum Physics. Great scientists like Niels Bohr and Werner Heisenberg. We have to leave behind the safe path of well-known physics. We even have to leave behind the founders of classical physics. We have to leave behind a very special scientist like James Clerk Maxwell, the founder of Classical Electrodynamics.

And when we walk all alone in darkness, wondering where to go, we have to remember the first beginning of the discovery of light. How a man, half a monk, half a scientist, like Isaac Newton discovered the first principles of the light when he saw the first secrets of light being revealed. When the pure white light was broken through a prism and separated in the colors of the rainbow. Isaac Newton was touched by the beauty of the light as well as in his religious way as well as in his scientific way.
And that is the secret that the world has forgotten. Everything will be revealed to us, when we step down from our towers of power and kneel humble for the beauty of that what has been given to us. Because there is wisdom in beauty. There is knowledge in prayer. And the most powerful wisdom will be given to us out of love. Do not claim wisdom but receive it humble and enjoy the beauty of it.

There is nothing more “non-scientific” in the world than to claim that we have found the “God’s particle”. There is nothing more arrogant in the world than to claim that we have found the theory of everything and that we have framed God into a quantum mechanical box.

But when we make ourselves humble and kneel for the beauty of the world. When we open our heart for the love that is carried by the beauty, wisdom will come to us and answers will be given for free. Doors will be opened. And we will discover the secrets to open the hidden doors to the unknown worlds.

When we go back in time, back to 1672 when Isaac Newton just had discovered the beauty of light, showing all its hidden colors. And we ask the “hidden world showing the beauty of light”: how can we build a world? We will simply find the answers. And knowledge will be given to us for free. Knowledge beyond Superstrings. Knowledge beyond 10-dimensional spaces.

Because the world is always in balance. Newton’s second law of motions simply expresses the balance in nature. And
balance will be our answer. To build a world, we have to build a world in balance. And that is the only knowledge that has been used to build a new theory beyond Superstrings and beyond 10-dimensional spaces.

The discovery journey to this new theory beyond Superstrings will be lonely and dark. Because there will be no guidance from well known physics. Equations have to be reinvented. And the road will lead straight through faith and believe, through manipulation of truth, through political intrigues, through the darkness of the world. But there is always the hope that at the end of the tunnel of darkness, there will be light.
1.1 The Rocks on which Modern Science has been built

One of the greatest Physicists in History is Isaac Newton. There are two Isaac Newtons. The Isaac Newton we do know and the Isaac Newton we do not know. And much of what we do not know or what has been revealed recently about Isaac Newton is what we do not understand. Because our modern mind has become blind for the world of God. And the part of Isaac Newton, hidden for the world, has been presented to the world as a strange obscure alchemistic part. A part that the world should better forget.

Because our modern mind has become blind for God. And because we cannot see God anymore, we cannot hear God anymore, we cannot feel God anymore, we have started to create a God for our own. A God like the Golden Calf in the Sinai.

Our modern mind who tells us that dreams are lies and visions do not exist. Our modern mind who tells us that without scientific evidence the facts become meaningless and are thrown away. According scientific facts that Moses was never with his people for 40 years in the desert and Moses even never did exist. We do not believe anymore in dreams. We do not believe anymore in who we really are. We have forgotten our soul, we have forgotten our dreams and we have started to build our own world. A world build by our own mind.

We have started to throw away our dreams. We have started to throw away our visions. And we have thrown them away only because of a lack of scientific evidence. The modern
world in which science has taken over religion. And the mind has beaten the heart.

And in that world of modern science, there is a part of Isaac Newton that we cannot accept. That part that has been kept hidden for the world. Because that part did not fit into our modern scientific mind. A mind in which Alchemy is a weird strange thing from the middle ages and is definitely not scientific and it is definitely not part of the world of God.

A world in which we have the choice to be Scientific and consequently be Atheist or being a believer and believe in the world that our mind has created for us.

Newton’s mind did not exist in either of both worlds. And Newton followed his own path in which he did not reject anything until he found the really meaning of it. Newton followed his own path and in my believe Newton followed the path of the Light. The Light that is as well from this world as from the Spiritual world. The world where we came from before we were born. The world where we will go to after we die. And that world does not fit into our mind. And that is why that world has to be rejected. Or at least has to be hidden for our mind.

Our world of the mind has turned into a prison of our soul. A prison in which dreams and visions are not allowed to exist. A world in which God has turned into a kind of “The Wizard of Oz”. A world in which God fits better into a modern version of the Wizard of Oz. In our world of the mind is no place anymore for magic, for spells and movies
like the *Harry Potter* series which have become the fulfilment of our forbidden dreams.

Because deep in their heart people still know the truth. Somewhere deep in their heart they still can remember how it was in the land of magic. Like Isaac Newton knew that there was more than just only science. He knew that there was more than just the doctrines of the church. And that land of magic was very real. *Alchemy* had never the goal to transform lead into gold. The descriptions in Alchemy were protections against the merciless punishments of the churches against everything that was against their doctrines. And Lead and Gold were protective symbols for spiritual development.

Isaac Newton had good reasons to keep many of his spiritual writings secret. Because Newton was a scientist who did not accept just only doctrines but he was a man who wanted to know the world behind the doctrines. Because he knew that the world of magic did not always fit into the world that the mind had created. Because his world did not fit into the scientific world and his world did not fit into the religious world of the church. And to protect himself and his family he kept the most of his valuable knowledge hidden for the world.

Newton had built his scientific world, his scientific house house on his personal relationship with God. Because there is no other relationship with God than a personal relationship. A relationship that the world of the mind will never understand. Newton had built his house on the rock of his believe.
After Newton the two worlds grew apart. The religious world and the scientific world. Newton was one of the greatest scientists and mystics in his time. The next great scientist in his century was James Clerk Maxwell. Maxwell was religious is a way that the church wanted him to be. But Maxwell had nothing in common with the hidden magical spiritual world of Newton. He was most of all a scientist. And in that way he has developed his famous equations of Maxwell.

Newton has built his house of science on the rocks of his believe. But Maxwell did not build his house of science on the rocks of his believe. He has built his house on the rocks of his own scientific intuition.

And the modern world has built our modern scientific world of Quantum Physics on the rocks of Maxwell. A world very different than the world of Newton. A world without dreams. A world without magic. A world without visions. An empty world. A world build on our own intuition without any guidance from the Spiritual World. A world without dreams. A world without magic. A world without visions. A world without protection. Because without our dreams, without our magic and without our visions we are blind walking around in a land we do not understand. Walking around like Dorothy in the land of Oz. Unaware of the dangers. Unaware of our own powers.

In this book a new theory will be presented in which this new concept in Quantum Physics of the “Particle-Wave-Mass Tri-Unity” has been built on the rocks of Newton. A
science where the Spiritual World is connected to this world where we do exist between our birth and our death. Like it was in the days of Newton. A world that leaves a place for dreams, visions and magic.

Because magic is not anti-God. Dreams are not anti-God and Visions are not anti-God. Dreams, Visions and Magic are anti the God we have created. Dreams, Visons and Magic are anti- the “Golden Calf in the Sinai”. Dreams, Magic and Visions are against our image of God. Because the true name of God is “YHWH” : “I am who I am”. We cannot create God. We can only find God when we throw away all our false creations of God and all the false images of the “God we Want” and open our heart for the truth that is unknown to us. We will not find God in our churches. We will not find God in our mosques. We will not find God in our temples. We will not find God on the Holy grounds we have created. We will not find God in the Holy cities. We will not find God in the Promised Land.

We will find God in the deserts of our loneliness. We will find God when the pain and the sorrow have broken our heart. When all our dreams have been taken away. We will find God when we are crying, when we have lost everything and we are standing alone, weak, vulnerable and naked in the darkness of the night and ask God for help and understand he is our only “The Last Hope”. Beyond him is nothing. Then we will find love and the true mercy of God. And an amazing light of love will surround us. The light that will send the darkness away.
1.2 The Tri-Unity in Science

The presented theory in this book has been grounded on a fundamental mathematical mistake in the famous George Maxwell’s Classical Electromagnetic Field Theory with an Impact on General Relativity, Quantum Physics and the boundaries of our Universe.

In this new theory the old concept in Quantum Physics of a mystic relationship between particles, waves and mass will be replaced by a New Unification Theory in which Particles, Waves and Mass are the 3 aspects of the same Origin. The Origin of this Universe. The Origin of this world.

The Tri-Unity in Science. A science where the hundred year old “Particle-Wave” duality in quantum physics has been replaced by the “Particle-Wave-Mass” Tri-Unity. A science build on the theories of Newton.

In the classical Wave-Particle duality, the mass of an elementary particle has been divided by a “De Broglie Wave” (probability wave, material wave), which is a solution of the Schrödinger Wave Equation. The mass of an electron in a spherical orbit in the Hydrogen Atom is dived by a spherical probability corresponding to the mathematical solution of the wave equation.

In this new Unification Theory the Particle, the Wave and the Mass become the 3 aspects of the same origin. A concept in which probability does not exist anymore.
A new concept in which light (electromagnetic waves) are the carrier of the tri-unity in this material world. That light can confine itself and create matter, create our world, create our universe. Light that has the three aspects:

1) The particle aspect. When light confines itself through “Electromagnetic-Gravitational-Interaction” a confinement has been created with a sharp suddenly changing boundary layer. An extremely thin boundary layer where the equilibrium between the attractive confining Electromagnetic Gravitational Forces and the repulsive scattering Electromagnetic-Gravitational forces changes within an extremely thin area of the confinement from a resulting confining force into a resulting scattering force.

2) The wave aspect. The Wave aspect of light has been discovered first by the Dutch Scientist Christiaan Huygens. He published in 1690 the Treatise on Light in which Huygens introduced the Wave aspect of light. An important necessary requirement for the Electromagnetic-Gravitational Confinement of light is that the Confined Electromagnetic Wave has one single frequency, presented in Equation (13). The well-known Quantum Mechanical Effect “Entanglement” is the fundamental evidence that the ”Particle-Wave Duality” is not complete and cannot explain “Entanglement” because of its separated “Particle” aspect. Only the “Particle-Wave-Mass 3-Unity” can describe and explain “Quantum Mechanical
Entanglement”. Because in this “PWMU” model the particle itself does not exist anymore.

3) The mass aspect. It is impossible to assign mass to free electromagnetic radiation. Because it is impossible to accelerate or to slow down free electromagnetic radiation. Free electromagnetic radiation propagates with the speed of light “c” and is a Universal Constant. But for confined Electromagnetic Radiation, the group velocity equals zero and it is possible to accelerate or to slow down Confined Electromagnetic Radiation. At rest the radiation pressures within the electromagnetic confinement counterbalance in every direction and the resulting forces equals zero in every direction. During an acceleration, the radiation pressures within the confinement do not counterbalance anymore as a result of the Lorentz Transformation. Equation (36) represents the mass (inertia) of Confined Electromagnetic Radiation.

In the Copenhagen Interpretation, the fundamental concept in quantum physics is the Particle-Wave duality. In this hundred year old concept a particle remains a particle with its own mass. The “De Broglie Wave” is a complex probability wave that describes the probability where the particle will be. In the example of an electron in a spherical orbit around the nucleus in a hydrogen atom, the electron remains a particle which will be anywhere in the spherical orbit around the nucleus with a spherical probability division. The “De Broglie Waves” are solutions of the quantum mechanical “Schrödinger Wave Equation” or at
relativistic velocities the “De Broglie Waves” are solutions of the relativistic “Dirac Equation”.

In the Tri-Unity concept, the Particle aspect, the Wave aspect and the Mass aspect are the three aspects of the same origin. This origin is confined light (Electromagnetic Radiation) of One Single Frequency. In the Tri-Unity Concept, the fundamental concept is the Particle-Wave-Mass Tri-Unity. In this concept a particle does not remain a particle with its own mass. The particle has a flexible dimension, frequency and mass and changes during a transition from a lower to a higher energy level. The corresponding dimension changes during this transition, the corresponding frequency changes during this transition and the corresponding mass changes during this transition.

The “De Broglie Wave” is a real Confined Electromagnetic Wave with One Single Frequency that describes the Energy Level of the Confinement. In the example of an electron in a spherical orbit around the nucleus in a hydrogen atom, the electron is a spherical single-harmonic electromagnetic confinement around the nucleus. Because of the spherical confinement, the mass of the confined electromagnetic radiation will be divided in a spherical orbit around the nucleus.

During the transition of a higher energy level to a lower energy level a part of the confined electromagnetic radiation will be emitted as light and the confinement will lose (electromagnetic) mass. During the transition of a lower energy level to a higher energy level, the confinement will
absorb light and the confinement will gain (electromagnetic) mass.

The “De Broglie Waves” are solutions of the Electromagnetic “Schrödinger Wave Equation” or at relativistic velocities of the relativistic “Dirac Equation”. In this model the “Schroedinger Wave Equation” and the “Dirac Equations” are the Fourth Term of the 4-vector Electromagnetic Force Density Equilibrium Equation written in a complex way (equation 22 and 23, Ref.29).

Since the famous 1927 Solvay Conference the Bridge between Science and Religion had been broken forever when God was replaced by the Gambler and the Dice. The world became a meaningless world and mankind was following a path that would lead straight towards the swamps of nowhere. Life became meaningless. Because it did not matter anymore whatever we do. The outcome of the Dice would always determine what would happen. We were not part anymore of the outcome. And the flock of sheep walked away from the shepherd. The flock of sheep walked happy into the forests of darkness where the wolves of darkness were waiting for their pray.

Because it is a lie that there is no life after death. It is a lie that there is no life before death. It is a lie that it does not matter what we do and what we decide and what we think. We are here temporary on earth to learn to love. Because love will be our only weapon in the spiritual world where we go to when we pass away. Because there is not only Heaven in the Spiritual world where we go to when we die. There is also Hell where the predators of darkness are
waiting for us and where love will be our only weapon against the predators of darkness.

No mathematical equation will help us in the Spiritual World. Because words are meaningless in the Spiritual World. You can speak in the Spiritual World only form your Heart. And in that Spiritual World, Love is the most powerful weapon. By the Love in your Heart you can call for the Angels for help when you are under attack of the darkness. By Love you can expel demons and destroy them. Because the Love will always rule over the Hate like the Light will always rule of the Darkness.

The Hell is a place in the Spiritual World where the darkness rules. And only Angels have the Power to cut open the thickness of layers of intense darkness and to set you free. Set you free from a world where the predators of Darkness live and where the Predators of Darkness are protected against the light. When you are in Hell you will never be able to get out. Because there is no orientation. There is no up, there is no down, there is no left, there is no right. And nobody will hear you from the intense darkness when you are screaming for help. Words mean nothing in the Spiritual World. There is no sound, there is only silence. But when you open your Heart and send out your Love through the Darkness, you will be heard. And Angels will come and set you free. Because Angels rule over the Darkness. And Angels will always hear the voice of Love.

The famous 1927 Solvay Conference was considered a turning point in the world of Physics. The scientific realists like Albert Einstein had lost and the instrumentalists like
Niels Bohr had won the fundamental conflict. Since then Physics has followed the path of the instrumentalists in which Quantum Physics has been determined by the concept of Elementary Particles and Probability Waves.

The instrumentalists do believe that what you measure is the truth. But unfortunately that is not the truth at all. Because we do not really measure with our instruments but finally we do measure with our mind. We can measure the speed of a sound wave and then we get a number. Is that the speed of sound? No, that is not the speed of sound at all. We measure the speed of sound with our mind. With our final conclusions. Some will call the found number simply the speed of sound. But other people will say. No, what was the speed of the wind when you measured it and then they will subtract the speed of the wind relative to the observer and calculate from there the speed of sound. Because indeed, the speed of sound we measure depends on the speed of the wind. Our mind will give us the final answers and not the measurements.

When an ambulance moves towards us we will hear and we will measure a different pitch then when the ambulance has passed us and moves away from us. Measurements of the pitch will tell us nothing about the real pitch of the ambulance siren. Only with our mind we can come to the right conclusions. That is the point of view of the scientific realists like Albert Einstein. And they lost during that famous mind breaking 1927 Solvay Conference. Where the mind lost from the desire and the greed to get results and to become famous.
And since then the instrumentalists have always ruled over the scientific realists. And people started to believe in numbers. The mind had been set aside and only the numbers count. And physics became a strange weird science with color forces and quarks.

In our brave new world numbers rule over the mind. The soul has been kicked out and God has been turned into a Dice. Life after death has become a joke like life before death. With the mind completely ignored we have stated to believe in a world without a spiritual world. A world without colors. A world, dark, grey and black. Art, music and beauty have been removed from our schools, from our universities, from our society.

And the number rule over our world. Numbers in mathematics, numbers in physics, numbers in computers, numbers in performance, numbers in measuring our quality of life. A world of blind numbers, Because numbers mean nothing when you cannot think. When the mind has become blind, then the world has become blind. And blind meaningless numbers direct us on blind meaningless roads in a blind meaningless world. A world of blind meaningless complex numbers.

A world ruled by blind meaningless Quantum Physics controlled by blind meaningless complex numbers controlled by blind meaningless complex Probability Waves. This has become the unfortunate reality of our world today. Because Quantum Physics is ruling our world and is now everywhere. In our modern technology, in our
smart phones and in the coming generation of **Quantum Computers**.

But nowadays, almost a hundred years after the famous **1927 Solvay Conference**, after Einstein’s famous declaration: **God does not play Dice**, something is changing. It is like the blind world is running into a wall and the coming big clash, the coming revolution in Physics, will wake up again the human mind. And surprised we will ask ourselves: How did we get so far, how did we get so blind that we have lost so totally our mind an have believed in blind scientists who were preaching blind numbers they never understood. That we have forgotten the power of love and have turned our world full of colors, beauty, music and art into a blind world of shadows and darkness enslaved by the numbers.

This will happen because the truth can never be swept under the carpet forever. One day we will face ourselves and find out that we are living in a world of full of lies. And the scientists start already to feel that the big clash is coming. They already measure that what they do measure is not what they want to measure.

It started already in May 2013, when for the first time a photo had been made of the **Probability Waves Inside the Hydrogen Atom**. It should be impossible to make a photo of a **non-existing complex probability wave with mass zero**. But the fact could not be denied anymore that scientists had succeeded to make the “complex” and the “non-existing” quantum mechanical “**Probability Wave**” visible. New discoveries like “**Photonic Molecules**” and “**Photon-**
Photon Interaction” require a new interpretation of the Copenhagen Interpretation. Since the Copenhagen Interpretation there is still no clarity about the physical interpretation of the Quantum Mechanical “Probability Wave Function”

This Manuscript describes a third unknown interpretation of the Quantum Mechanical “Probability Wave Function”. A fundamental physical interpretation that will change the generally accepted Copenhagen Interpretation.

This Manuscript will answer the fundamental question: Does an alternative theory exist in which the existence of this particular photo, of the Quantum Mechanical Probability Wave within the Hydrogen Atom, could be explained. And that the famous photo of the Hydrogen Atom can be explained in a logical and a simple way.

To find the answer, we have to go back in time. Back 300 years in time to the moment when Isaac Newton discovered the beauty and one of the many secrets of the light. The moment when science walked away from light.

And we return to the fundamental question: “Is it possible to build Matter out of Light (confined electromagnetic waves)?” To answer this question if it is possible to build Matter out of Light, we first have to answer the question how we have come to this world of Probability Waves and Elementary Particles and Quantum Physics.
Louis de Broglie described in 1924 in his PhD thesis the wave properties of matter. Erwin Schrödinger published in 1926 the well-known Schrödinger wave equation with the characteristic spherical and elliptical wave solutions. To describe these material waves, the immediately and first explanation was: “There is only one possibility. These are “Electromagnetic Waves”. De Broglie Waves are ” Light Waves”. Because these were the only waves, known in the world of Physics, that could travel through vacuum.
But there was a fundamental problem. These material waves, discovered by Louis de Broglie and mathematically described by Erwin Schrödinger could never be solutions of the well-known 4 linear equations of James Clerk Maxwell. The material waves were spherical and elliptical solutions of confinement and that was impossible for the solutions of the linear Maxwell Equations. According to the linear Maxwell Equations, superposition is possible but Electromagnetic Interaction and Electromagnetic Confinement can only be described by a set of non-linear differential equations.
To solve this fundamental problem a new set of 3 non-linear Electromagnetic Equations (Equation 5 in this manuscript) has been developed which replaces the well-known 4 linear Maxwell Equations and the possible solutions of Equation (5) are also Spherical and Elliptical solutions of confinement. Table 1 in this manuscript presents a number of Electromagnetic Spherical Confinements as solutions of Equation 5a.

A second problem was that the model of the atom of Bohr could not hold. How could an electron be everywhere at the same time in a kind of a spherical shell surrounding the nucleus. And be a particle at the same time.

And Bohr found a compromise to declare the “De Broglie” waves to be the probability waves. Two problems were solved. Bohr’s planetary model could hold. And there was a name for the unknown material waves, discovered by Louis de Broglie and mathematically described by Erwin Schrödinger. The theory of “Probability Waves, Elementary Particles and Quantum Physics” had been created.

To find a possibility, to create matter out of light we have to go back to the Equations of James Clerk Maxwell. The only possibility to declare the probability waves, discovered by Louis de Broglie, to be electromagnetic waves, to be light, and to be the building element of our universe, is to find evidence that he Maxwell Equations are not complete and that it is possible to confine light (electromagnetic waves) in spherical and elliptical shapes. A new equation has to be found. In this article it has been claimed that this missing equation is Equation (5). Because the Theory of General
Relativity has been built on the Einstein-Maxwell Equation, a new equation has to be found that describes in a generalized way the interaction between light and matter. This missing equation is Equation (5-a).
2.1 A Historical Perspective on the conflict between Causality and Probability, the Ethics and the conflicts in Science on the battlegrounds of Light and Darkness

The famous eclipse expedition of 1919 to Sobral, Brazil, and the island of Principe, in the Gulf of Guinea, led by Dyson, Eddington and Davidson was a turning point in the acceptance of the General Theory of Relativity developed by Albert Einstein in 1915. The correctness of this theory has been proven since then in many experiments. The success of his predictions made Einstein famous. When Albert Einstein published his famous Einstein Field Equations (Einstein-Maxwell equations), which were the mathematical foundation on which the Theory of General Relativity has been built, he built his theory on the complex 4-dimensional Minkovski Space, developed by Hermann Minkovski, the Electromagnetic Lorentz Transformations, developed by Hendrik Antoon Lorentz and the fundamental Maxwell Equations. Einstein had a great imagination and was inspired by the imaginary 4-dimensional complex space-time continuum, suggested by his teacher Hermann Minkovski.

But questions remain. Why would space and time be equal. We do experience space and time always very differently. When we shine the light into a room, all 3-spatial dimensions of the room will be enlightened and become visible. But the fourth dimension time will always remain invisible. We cannot look into the future and we cannot look back in time by the illumination of light that shines into time. There is still no fundamental logical ground for the Theory of General Relativity and the 4-dimensional complex Space-Time Continuum (Minkowski Space). Since
the success of the predictions of Albert Einstein, nobody ever doubted about the correctness of the theories of Albert Einstein. The success of his predictions made Einstein famous.

In this manuscript, the starting point is almost 300 years ago. Long before James Maxwell published his Maxwell equations, before Albert Einstein published the Theory of General Relativity and far before the time Niels Bohr introduced the probability waves, discovered by Erwin Schrödinger which were the nonlogical grounds on which Quantum Physics has been built.

The starting point is the moment just after Isaac Newton had published the breaking of light into the colors of the rainbow through a prism in the “Lectiones Opticae” in 1728. Newton just had discovered the beauty of light when light had revealed one of its many secrets. And he could only express: ”Light is beautiful”.

That has been the turning point in our history of science. Since then science has left the path of the light and has followed the path of our own mind. We did not follow anymore, but we started to lead. To lead in arrogance and surrounded by the illusions of fame. But instead of following the path of the mind that has left every logical thinking, a path that is finally following the path of quantum physics and elementary particles, the ghost lights that will lead us to the swamps of darkness, this manuscript wants to return to the path of the light. Because the light has always given the right answers. And has always guided
mankind in science and through life. What would our world be without the beauty of light?
2.1.1 The Shadows of the Darkness

When we look at the fruits of our modern science we can only see the fruits of darkness. A darkness where the predators are hiding to destroy our world of beauty, our world of light, our world of truth. Who are we following? The gambling devil leading us towards the ghost lights, the elementary particles, our new religion, which will finally lead us into the swamps of darkness, the swamps of blindness and finally no scientist will know how to go further? Or do we follow the fake light of the illusion of fame that will lead us into the deepest darkness the world has ever known?

In this time where a totally destructive final world crisis is building, the world needs leadership. And the most powerful leadership is science. But how can science lead when science is totally blind. And science believes in the lies of the illusions of Maya. We behave like children who throw a clock towards the wall until it falls apart and the wheels fall on the ground. Yes, a child believes that then it understands how a clock works. But that is the fantasy of a child. Like we believe that we will understand matter by smashing matter in high energy accelerators until it breaks apart into elementary particles. But that is the science of a child. A world of fantasy where logic does not exist.

Because a clock is so much more than a collection of wheels. To understand a clock we have to build a clock. To understand matter we have to build matter. And we will will never be able to build matter until we understand the secrets of light.
Science needs a compass like a ship needs a compass. A compass without a ship sinks to the bottom of the ocean and will be totally meaningless. A ship without a compass will finally destroy itself when it breaks on the rocks of arrogance like the Titanic broke itself in arrogance. The ship needs the compass and the compass needs the ship. Together they are powerful. Alone they will destroy themselves. The science in our world is a science blind without a heart. The religion in our world is a non-logical religion without a mind. The heart needs the mind and the mind needs the heart. Together they are the most powerful weapon in spiritual warfare and together they can save the world and destroy the powers of darkness that are coming to the world. Alone they have no chance to survive the powers of evil and the world will come to an end surrounded by darkness. A worldwide holocaust, the world has never seen before. The empire of evil. Only when religion and science come together, they will become invincible and the evil powers will break themselves on this invincible shield. A shield that will rise when the heart and the mind come together.

Because science alone will be fooled by the darkness, because the science is blind and cannot see when it is surrounded by the darkness. In blindness science has created the atomic bombs that has destroyed Hiroshima and Nagasaki, in blindness science creates the most evil missiles and warplanes to kill and burn alive innocent women and children, in blindness sciences creates drones that are designed only to kill and bring fear over the world, in blindness science designs data systems that will control
mankind and bring them to slavery, in blindness science creates genetical manipulation to destroy who we really are, in blindness science serves the darkness.

And religion alone will also be fooled by the darkness, because religion is blind and has lost any logical way of thinking when it is surrounded by the darkness. In blindness religion has burned innocent people alive on the stakes in the middle ages, in blindness religion has created wars and has killed so many innocent victims, in blindness religion has broken the souls of those who were different and did not fit into its own small and limited boundaries, in blindness religion has broken the people who believed in a different God, in blindness religion has broken the soul of those with a different sexuality, in blindness religion has broken to most beautiful and the most valuable people in our world, in blindness religion serves the darkness.

There is no mercy of God, Allah, Elohim, because there is nothing to forgive. Because there are no sins. There are only wounds. Wounds that can only be healed by the power of love.

There is no punishment because YHWH will never be wrathful. Life is not a combination of punishments and rewards. We came to Earth to learn to love each other.

And you leaders in Religion. To where do you lead your people? You Leaders in Blindness. Leaders in Emptiness. Leaders in Darkness. To where do you lead your people? To the land of the blind? To the land of the Lost Souls? To the Land of the Shadows? To the Land of Darkness?
How can you lead your people when you are blind and cannot see? How can you lead your people when you are deaf and cannot hear? How can you lead your people when you are numb and cannot feel?

You preach about God. You preach about Allah. You preach about Elohim. You try to find him in your Holy Books. But books will never be Holy. You try to find him on your Holy Grounds. But Grounds will never be Holy. You try to find him in your Holy cities. But cities will never be Holy. You try to find him in the Promised land. But here on Earth, there is no Promised Land. You try to find him in your Holy Churches, in your Holy Mosques, in your Holy Synagogues. You will never find him there. The only Path to the Promised Land, the only Path to YHWH is the Path of Love.
2.1.2 There will always be Light

The Path of Love is a steep Path. A Path surrounded by Danger and the Hate of the World. When you climb the Path of Love, the Clouds of Darkness will surround you and loneliness will be your only friend.

You will find him, the Only One, the Only One you are looking for during your whole life, you will him in your Sacred Heart. Because only your Sacred Heart is Holy. You came to this world through your Sacred Heart when you were born and you will leave this world through your Sacred Heart when you die.

Your Sacred Heart is the Doorway to Heaven and the Doorway to Hell. Your Sacred Heart is the tunnel of darkness you will travel through when you die and discover at the end of the Tunnel of Darkness the Amazing, Frightening, Blinding Light. The Light of Love.

Because Love becomes visible in the Spiritual world as the brightest and most beautiful Light you have ever seen. The Light you have never seen on Earth before. Because our World on Earth has been born and has been created out of the Spiritual World. And in the Spiritual world you will meet the Powers beyond your imagination. The Powers of Love and the Powers of Darkness.

The Doorway to Heaven and the Doorway to Hell. The doorway to the Promised Land where the Love rules and the doorway to the Shadow World, the Land of Darkness, where the Hate rules.
Your Sacred Heart is the Path to the Promised Land. You will find him, the Only One, in the love you give to your enemies. Because only Love has the Power to heal the wounds, the wounds of the world. Because Love is the Path. Love is the Road and Love is the only way that will lead you to the Promised Land. Love is the Only Road that will lead you to YHWH.

Love will save you from the land of darkness, the world of Hate and Love will bring you to the Promised Land, the world of Love.

Religion has lost its mind when it has forgotten the revelation of God, when God revealed himself to Moses from the midst of the burning bush by his only true name “YHWH”. “I am who I am”.

And that is the only logical consequence in religion. We have to be who we really are in the deepest of our soul and we have to let the other be who he or she really is. Do not transform ourselves or the others but follow the name of YHWH and be who you really are and let the other be who he or she really is. Instead of judging and breaking people because of their sexuality, those who are gay, transgender, pansexual, intersexual and so many other sexualities. Let them be who they are in the name of YHWH and do not judge them. What other kind of religion or God people do believe in, let them be in the name of YHWH, do not judge them. Respect who they are and what they do believe in. That is the only logical consequence of the holy name “YHWH”.

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2.1.3 The Shadows of Darkness over Religion

Evil grows on the fields of pain, injustice and suffering. And evil will cause more pain, more injustice and more suffering so that more evil will grow. Until evil will finally cover the whole earth and the evil will kill all the light, all the hope and all the love. Evils grows like a weed and feeds itself from the life forces of those who are strong and healthy until they are destroyed and the hope and the love in them has died.

Evil grows like it has grown in the concentration camps of evil in Auschwitz-Birkenau, Treblinka, Sobibor and so many Concentration Camps in the Second World War where the injustice ruled and the hope and the love were killed. That is the face of darkness. That is the face of evil. That is our future when we do not fight back.

Jesus gave mankind the perfect weapon to destroy the evil, to destroy the darkness. ”Love your enemies”. These are his powerful words in spiritual warfare. Because by loving our enemies we will destroy them. We will smash the darkness that has taken them into the bright light of love. Only by love we will destroy the fields of pain on which the evil is growing, by love we will destroy the powers of injustice that gives power to the evil, by love we will bring back the hope because hope is the light the darkness cannot face.
There is no power in the whole universe stronger than love. And only love can destroy darkness and only love can destroy evil and only love can save the world.

All the Jews, all the Muslims and all the Christians in our whole beautiful world are following “YHWH”, the only creator of the universe, the only creator of the light. God of truth, God of justice, God of mercy.

But who are you following? “YHWH” is his only name, “I am who I am”. You can only follow “YHWH” by being “YHWH”. Be who you really are and do not let yourself be threatened by fear and be enslaved by the king of darkness. When you are rainbow color sexual, be rainbow color sexual. The love has no walls. The love has no boundaries. The love has no fear. The love is pure and is created by “YHWH like he created the light and the beauty of the light shines through the rainbow.

The only one who want to be kneeled for is the king of darkness. The only one who wants to enslave the whole world in his darkness is the king of darkness. The only one who preaches the fear is the king of darkness. The only one who kills the beautiful love in the human soul is the king of darkness. Why are you following the king of darkness with his evil lies, tricks and manipulations of truth.

The king of darkness, he who has entered, hidden in darkness, your holy Synagogues, your holy Mosques and your holy Churches. In blindness you are preaching the fear. In blindness you are preaching the merciless judgement. In
blindness you are preaching the war. In blindness you are serving the darkness.
2.1.4 The Shadows of Darkness over Science

The king of darkness who has entered the holy Temple of Science. The Temple of the mind. The Temple of power, controlled by funding. You are managed, controlled and enslaved by money, controlled by evil. How could you forget your heart. Instead of using your power to save the people and to save the world, you use your power to create war machines to kill people, to create software that will finally be used to enslave the whole world and to manipulate the genetic code of our whole creation. You who believe in honor, in prizes, in funding are being misled by honor, by funding and by prizes. You are creating the fruits of darkness and in blindness you are following the king of darkness. Mislead by non-existing probability. Mislead by non-existing elementary particles. Mislead by darkness.

You scientists have forgotten the world of your dreams. You have forgotten who you are. You have forgotten where you came from. You have forgotten where to go to. You have forgotten your destiny. How can you find your way back?

You walk in Blindness, following Blind numbers in a Blind meaningless world. Leading in Blindness the world to the deserts of Blindness. How could you forget yourself so much?

You follow the false prophets of Power, but power is only weakness promising you that what you will never get and promising that what you will never find.
You follow the false prophets of Fame and in Fame you will lose your destiny, in Fame you will lose who you really are and in Fame you will forget you’re the path of Love and you will never find back your way home. Your home, the safe harbor of love.

You follow the false prophets of Gold. And in Gold you will lose your soul. You will forget who you really are and in Gold the Love will die. You heart will become cold and meaningless. In Gold your soul is dying because no soul can live without love.

Dreams are more powerful than Gold. Because Dreams are from the real world and Gold is only an illusion. Dreams have the Power to wake you up and to show you how to find back your way home.

And I am not speaking about the fake world of dreams. Dreams created by chemicals like drugs. Dreams created by fear. Dreams created by desire.

I am speaking about Real Dreams from the Real World. The world where you came from before you were born. The world where you will go to after you die. Real Dreams have power. Real Dreams have wisdom. Real Dreams have knowledge. And Real Dreams will show you the path. The path of knowledge. The path of wisdom. The path of Love.

Only Real Dreams have the Power to save the world.
You scientists have created a scientific world without dreams. A Path without a beginning And a Path without an end. A Path of Blindness. A meaningless Path in a blind meaningless word. How can you save the world if you cannot even save yourself?

You Professors in Blindness are teaching your students at your famous universities your copy-paste wisdom in a copy-paste world. You send them to the deserts of emptiness where they will never find wisdom. The deserts where they will never find knowledge. Because you will never find wisdom in scientific books and in your famous Journals where the shadows of Fame, Power and Gold rule.

Because wisdom is never written in books. Wisdom will be revealed in the power of your dreams. The real dreams from the spiritual world. Knowledge will be shown to you from the world where the wisdom is. The world of real knowledge.

You Professors in Blindness, Professors who walk in fame surrounded by the illusions of power and control, you have forgotten your dreams. You have forgotten your heart.

Because you will only find wisdom in your Spiritual Heart. Because you came to this world through your Spiritual Heart when you were born and you will leave this world through your Spiritual Heart when you pass away.

You Professors in Blindness, how will you show your students how to walk the Path while you never have walked the Path yourself. You never have walked the Path of
Knowledge, you have never walked the Path of Wisdom and you never have walked the Path of Love.

The real master in Wisdom serves and makes himself small so that the student can grow.

Instead of grabbing your fame, your power and your gold together. Instead of fighting about funding and prizes and control. Instead of walking straight towards the swamps of darkness where you will be drowned and will forget who you were. Instead of leading your students on the path of Spiritual Destruction.

You should become the silent one and turn around on the Path of Spiritual Destruction. And present yourself to your students as the one who does not know. As the one who wants to learn. As the one who needs them. As the little one who has lost his way. As the one who wants to be their friend. And find together the way back to the path of the Light, the Path of Knowledge, the Path of Wisdom, the Path of Love. And find back the Light that you have forgotten. And find back The Light that has created us al. The Light in this world and the Light in the Spiritual world.

You Professors in Fame are teaching your students in your glory in your buildings of Fame. Famous universities where famous professors teach. Presenting yourself powerful and almighty. But what do you really give them. For their high intuitions you send them to the deserts where the knowledge doesn’t grow.
You send them away with your copy-paste knowledge and then they get their grades with your exams of multiple-choice. And let your students pass who have learned nothing else but your copy-paste knowledge in the years during their study and you send them into our world to obtain power and fame and copy-paste the mistakes you have made.

How can you change the world when you do not change? Science has the power to bring Heaven on Earth and the power to change the deserts into Oases of prosperity and to bring peace into the world. But that cannot happen without real knowledge, without real wisdom, without real love.

Your problem, Professors in Fame, is that you do not love knowledge, you do not love science, you do not love your universities, you do not love the people you teach. You follow only the greed for power, the greed for funding, the greed for fame. When you make yourself small and become the student of your students, then you will make space for them to grow and to receive the light. The light of knowledge, the light of Wisdom, the light of Love. And there you will guide them. When they are standing in the Light and you are standing in the Shadow. Small and Serving. But always ready to guide them and to support them on the path they walk.
2.1.5 The light will always return

Is there hope? Is there a possibility that the world will not go under like a gigantic Titanic crashing on the mountains of ice while the religious leaders are fighting and the scientists are looking focused at their instruments and forget about the world.

Yes there is always hope. There is always a possibility. We can consider the world like a computer game with the red and the blue destroyers. And some players are wearing the red glasses, seeing only the red destroyers, and will be beaten by the blue destroyers because they cannot see them and will lose the game.

And other players are wearing the blue glasses, seeing only the blue destroyers, and will be beaten by the red destroyers because they cannot see them and they will lose the game.

Only he who wears the glasses with one red glass and one blue glass is able to win the game because only he can see as well the blue destroyers and the red destroyers.

To continue with this model. Religion can only see the Red Destroyers and Science can only see the Blue destroyers. Only when they cooperate fully together they can save the world.

Religion is very powerful. Around 31 % of the 7.3 billion world population is Christian. Together with the Muslims, Hindus and the Jews they form the majority of the world population. And when they cooperate together, they have the power to change the world. They have the power to save the world. But they are unaware of the hidden enemies which do not fit into their Religious World Vision.
Science is very powerful. In 2017 the world has spent about USD 1.7 trillion on Research and Development. When the scientific world cooperates together, they have the power to change the world. They have the power to save the world. But they are unaware of the hidden enemies which do not fit into their Scientific World Vision.

The world has become a lost world because the Scientific world refuses to believe in a Spiritual World and the Religious world refuses to accept a logical world.

The churches have made the most anti-scientific mistakes in history by denying the Heliocentric Model of Galileo Galilei which finally led to the Condemnation in 1633 of Galileo by the Catholic Inquisition.

But when we look at the positive side of religion, the churches have a deep inside insight into an invisible spiritual world which effects our world in many ways. And in that Spiritual World there is good and evil. And the world has seen the face of evil very clearly during the Holocaust. But the world did not see how it all came so far.

The goal of the Holocaust has never been just to kill all the Jews. Because that was not enough. Else the Germans could just have killed the Jews in their houses which was much cheaper than transport them all to the awful traumatizing destruction camps. These camps have been designed by an evil world which comes from the Spiritual World and is not from this world. These destruction Camps have been designed not only to kill the human bodies but most of all to kill the human soul. To destroy the dreams, to destroy the hope, to murder the love. That is the Face of Evil. Because Evil fears the Love. And Evil will always kill the Love out of Fear for its power.
That world of Evil is very real and is preparing a next attack to our world and when Evil takes over, the world will turn into a gigantic Holocaust where the dreams, the hope and the love will be murdered.

Most of you, readers of my work, have never seen evil. Do not know what it is. Have no idea of its power. Have no idea of the danger for our world. But Jesus knew the weak spot of Evil. Jesus knew that Evil can only be destroyed by love. And when he spoke to his people: ”Love your enemies” he said: “Love your enemies and destroy them by your love”. Because Evil cannot defend itself against Love. Like the shadow cannot defend itself against the bright light of the sun.

That is how exorcism works. Not like it has been presented in a totally non-realistic wrong way in movies like the Exorcist. Because you do not expel demons by holy words from holy books and holy water. Words, Books and Holy water are meaningless in Spiritual Warfare. But demons do exist and they are part of the empire of the king of darkness. And of course you can call him Lucifer, Beëlzebub, Satan or whatever name. But the empire of darkness does really exist and you can enter that world after your death when you do not know anything about spiritual warfare, praying, calling the angels of love for help, and the power of love. That world of darkness is real after your death and during your life. But most people are not aware of that world during their life.

When you are part of real exorcism, then you will know what it is. When you know somebody already for very long, you recognize the person just by looking into his/her eyes. And you recognize the person. The soul of the one you do already know for so long. And one day, you look in the person’s eyes and you see suddenly in a fraction of a
second, the eyes of a totally different person. It draws your attention and you look deeper into the eyes of the unknown person. And you notice that that (hidden) person cannot look away anymore. It feels like you have caught (entrapped) the look of the other person. And then the Spiritual War begins.

The unknown (hidden) person will do everything to force you to look away, so the unknown (hidden) person can escape. And suddenly you are looking at an extremely ugly awful face that looks like the most ugliest horrible witch you have ever seen. The face is so disgusting that you want only to look away. But deep inside you, you know that then you will lose your grip and the unknown (hidden) person will disappear and your chance to expel the unwanted (hidden) person has gone forever.

When you keep looking into the (hidden) person’s eyes, you will suddenly, from deep in your soul, know how to fight. You remember again Spiritual Warfare as it has always been. And you suddenly know that Love is your weapon. Love is your sword and with Love you will get that other person out of the one you know already for so long.

Then the war really opens up. The face turns into an ugliness you have never seen before. The eyes spit hate into you and awful witchcraft opens up. And then you suddenly know. When you do not give up, you might lose your eternal soul. You realize the world of dark powers behind the demon, the world of evil behind the demon and you feel that you are challenging a world of evil you had forgotten already for so long. When you do not look away and you keep loving that horror, then a name will come up in you. You suddenly know the name of the demon and you know it: “when say the words”, you will expel the demon. And you will start the war.
And when you speak out the name of the demon, in a flash so suddenly, a shade of darkness so powerful, the demon leaves the body of your friend. And you see your friend emotionally break down in tears. Because your friend feels a freedom he/she has not been aware of it already for so long.

Is it over then? No, forget it. It is not over. Now you have challenged the Empire of Darkness”. And it will never be over. You will never get your normal life back again. Demons will enter your bedroom, Demons will enter your dreams, Demons will break you until you will finally admit their power, their strength. Because after every Demon you beat, a stronger, more powerful Demon will rise, until you will meet powers you can never overcome. You cannot fight alone against an army of Darkness.

And where is God in this all. He is not there. Because in Spiritual Warfare there are rules. And you do not walk alone on the battlefield. You fight together in groups and you will only do what has been asked you to do. And when you have the naivety to enter the battle field alone, then you cannot ask for help. You cannot jump off a high flat building and then ask God to save you.

And this is the real power of the churches. They know about the evil world. They know about the power of Lucifer. But they do not like it to speak about it, because it scares the people. But he churches know how to defend ourselves against the evil world and the scientific world is not even aware of this unseen world. And the scientific world is not prepared for any attack.

And that is the power of the churches. Instead of judging movies like the popular Harry Potter movies, they should
show them during their services. Because God is not only good. There is also a bad guy. And it does not matter if you call him Voldemort, Lucifer, Beëlzebub or Satan. What is in a name?

Churches should become again a Hogwarts School. A powerful university where students will learn everything about evil and witchcraft and about spiritual warfare. About exorcism and the power of love. About the real dangers in the world. And that there is witchcraft also on the internet. And that spells really do exist. And that it is possible to sell your soul to the evil world. They should learn that you can meet the devil at Wallstreet because there is a lot of evil in the financial world.

And they should learn about heaven. They should learn how to pray and to call for the angels of love. Because when you are dead, you will need them. They should learn how to defend yourself against an evil attack. Because most adults have no clue what the youth is doing on the internet. Adults have no clue of the spiritual warfare on the internet. And that young people commit suicide because they hear voices telling them to kill themselves.

What do the churches say to them? They send them mostly to a psychiatrist who gives them medication because most psychiatrists have never heard of the spiritual world. They don’t know anything about spiritual warfare. They know nothing about the human soul. They know nothing about witchcraft. They know nothing about hearing voices. They know nothing about the life after death.

Witches (male or female, it does not matter) like it to kill humans. They have the gift to speak into human’s mind. And they simply tell you to kill yourself until you become crazy and do not sleep anymore and feel the fear coming up.
You lose control and finally you give up. Because you did not know how to fight back.

You feel the fear deep in your heart because you never have learned how to fight the fear. Because you did not realize that the fear weakens you and that the fear is a powerful weapon of the dark side in spiritual warfare. Like the wolves use their howling to fear their victims and weaken them before they slaughter them.

What did you know about witches? What did you know about Lucifer’s world? The churches did not tell you. They only have condemned Harry Potter movies and they have made themselves like an institute of spiritual warfare totally useless.

And that is what has to change. Churches have to find back themselves. They have to overcome their own fear and start the war against evil. Because nowadays evil is everywhere. And evil is becoming more and more brutal. Now evil is presenting itself in public through organizations like ISIS and with suicidal attacks bringing fear into the world.

The churches have to wake up and take over control again. And speak openly about evil and how it is attacking our world and how the youth is in a very dangerous position. How the youth has been attacked by evil with the specific evil weapons like addiction, violence and rituals. Churches cannot run away for evil anymore or ban it out of their community.

The Churches, Mosques and Synagogues have to train their students in spiritual warfare in which no evil weapon will be avoided. Because you can learn how to defend yourself against evil attacks. And love is the strongest weapon of all. Because only love has the power to send the fear out of our
hearts. Only love has the power to break the evil spells. Only love has the power to expel demons. Only love has the power over the hate.

Because in the spiritual world love becomes visible like the most intense, most beautiful, most powerful light you have ever seen. It is a power that can break open the intense darkness of the hell and set a human soul free. Because the light of love will always be stronger than the shadows of the hate.

Because at the end love will always prevail. Love will always rule, because there is no evil power that is stronger than the power of love. That is the power that the churches have to regain. That is the wisdom of love that will rule over the science.

And the churches have to give up their anti-God statement that some people are better than sinners. We are all equal and we can only respect each other, support each other and love each other. That is the only way how we can follow God.

And in that commitment science and religion have to come together. Because only together they can save the world.
2.2 The Tri-Unity in Religion

“YHWH” is the light. The light that will destroy the darkness and will save the world. The light that shines in this world and becomes visible in the spiritual world as love.

When Religion comes together with Science, when the Spiritual Heart finds back The mind, evil will lose all his power. Then we will find that the light in our world is the same light that we see after we die. And in the spiritual world, the world we were before we were born, the world we go to after we die, in that world, love is visible as the strongest and the most beautiful light we have ever seen. Light is the first we see when we are born. Light is the first we see after we die. When we will understand the deepest secrets of light, the walls between our world and the spiritual world of the life after death will fall down.

“YHWH”. I am who I am. When we become “YHWH” we will understand that we are the spiritual world as well as this world as well as the doorway to heaven. The father, the Son and the Holy Spirit. The Tri-Unity “YHWH”.

We are the Tri-Unity of light as it was said by Jesus. Light is in the spiritual world (The father). Light is in this world (The son, born out of the Father, this world born out of the spiritual world). Light is the only doorway, the Holy Spirit, that connects this world with the spiritual world and let us pass from this world to the spiritual world when we die.
As Jesus has spoken: “I am the light of the world (John 8:12). No one comes to the father than through the son (John 14:6). I am the doorway to heaven (John 10:9)”. Jesus spoke about the light when he spoke about the Father, the Son and the Holy Spirit. Only the light can bring back together science and religion. When science and religion come together, when the heart comes back to the mind, a shield will rise that no evil can pass.

The doorway of light through which we leave this earth when we die and pass on from this world to the spiritual world. To Heaven or to Hell. Everyone who dies has to pass through the doorway of light, the Holy Spirit. An immense light that blinds you and throws you back. A light that only the love can pass.

That is the new path for science and religion together. To find back the light, science has thrown away. To find back the cornerstone that the world has lost.

In his famous conclusion to the book: ”A Brief History of Time”, one of our most courageous scientists Stephen Hawking has written: “If scientists could find the most fundamental laws of nature, then we should know the mind of God”.

2.3 The Tri-Unity in Science and Religion

In Religion the Tri-Unity has always been a fundamental aspect in Christianity. Since Isaac Newton Science and Religion started to grow apart and the distance becomes only bigger until the final break at the 1927 Solvay Conference. Because Modern Quantum Physics is anti-Religion, anti-God and anti-Spiritual world.

Because in the Spiritual World, there is no meaningless outcome. In the Spiritual world, our world here on earth has a goal, has a destiny and there is always a safe harbor to come home when we pass away. There is no gambling dice in the spiritual world and that’s why there should not be a gambling aspect in the fundamentals of our science and there should not be a quantum mechanical dice and there should not be probability waves in the fundamentals of our science.

People who have almost passed away and recover from the boundaries between life and death very often speak about an amazing peace they have felt. It felt like coming home. Entering a safe harbor after sailing over the rough oceans in the middle of the storms in our life.

This manuscript is about Unification. Unification between Science and Religion like it has been in the times of Newton.

Unification in Religion in which finally Religions will find back YHWH and Christianity, Judaism and the Islam become one again.

Unification in Science where the 3 fundamentals: Particles Waves and Mass come together in the Unification of this three aspects in the same Origin. The Tri-Unity Particle-
Wave-Mass is the building element of our universe. The cornerstone in science that has been thrown away with the introduction of Quantum Physics and the Tri-Unity had been replaced by the gambler and the dice during the 1927 Solvay Conference.

The same Origin that connects our world with the Spiritual world. The same Origin that connects Religions. The same Origin that will bring back together Science and Religion. The never understood Mystery of Light. The same Light that has already been described in Genesis 1:3.
3. Light as the Building Material of our Universe

When we return back to the world of light, we simply have to ask one question to the light. How is it possible that the light in our world does exist? And we simply follow Newton’s third law of equilibrium published in the “Principia Mathematica Philisophae Naturalis” in 1686.

This single fundamental only question has been asked: What are the fundamental boundaries which are required for a stable electromagnetic field configuration in which light can exist? And instead of taking the 4 well-known electromagnetic low frequency equations and put them together and find exactly the same results as James Maxwell has found, a different path has been chosen. There is only one boundary condition. “The electromagnetic field has to be in a perfect equilibrium (balance) with itself and its surrounding.” And when an electromagnetic field interacts with a gravitational field, exactly the same boundary condition is required. That is the single and only requirement. From this single requirement follows one single equation. Equation (5) (gravity excluded) and equation (5-a) (gravity included) in this manuscript.

All the solutions for electromagnetic configurations that are solutions of the Maxwell Equations are also solutions of Equation (5). But because of the special mathematical structure of (5) and (5-a) other electromagnetic field configurations are possible. And this will have an impact on our understanding of the universe, on our understanding of light. Because we cannot understand the universe until we understand light.
To find a possibility, to create matter out of light we have to go back to the Equations of James Clerk Maxwell. The only possibility to declare the probability waves, discovered by Louis de Broglie, to be electromagnetic waves, to be light, and to be the building element of our universe, is to find evidence that he Maxwell Equations are not complete and that it is possible to confine light (electromagnetic waves) in spherical and elliptical shapes. A new equation has to be found. In this article it has been claimed that this missing equation is Equation (5). Because the Theory of General Relativity has been built on the Einstein-Maxwell Equation, a new equation has to be found that describes in a generalized way the interaction between light and matter. This missing equation is Equation (5-a).
The first step that has to be taken, is to find evidence that “de Broglie Waves” (“Material Waves”, “Quantum Mechanical Probability Waves”) are “Confined Single Harmonic Electromagnetic Waves” is to find a new Electromagnetic Equation that will replace the well-known 4 Maxwell Equations. James Clerk Maxwell published in 1865 in ”A Dynamical Theory of the Electromagnetic Field” the 4 well-known Maxwell Equations. To find an equation that describes in an extended way the Electromagnetic field we have to go back to the time before
the Maxwell’s Equations. The Maxwell’s equations have been called the “second great unification in physics” after the “first unification in physics, realized by Isaac Newton. And that is the time we have to go back to, to discover a new equation, that unifies the electric and the magnetic field in a generalized way.

<table>
<thead>
<tr>
<th>Point Form</th>
<th>Integral Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \nabla \times \mathbf{H} = \mathbf{J}_c + \frac{\partial \mathbf{D}}{\partial t} )</td>
<td>( \oint \mathbf{H} \cdot d\mathbf{l} = \int_S \left( \mathbf{J}_c + \frac{\partial \mathbf{D}}{\partial t} \right) \cdot d\mathbf{S} ) (Ampère’s law)</td>
</tr>
<tr>
<td>( \nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t} )</td>
<td>( \oint \mathbf{E} \cdot d\mathbf{l} = \int_S \left( -\frac{\partial \mathbf{B}}{\partial t} \right) \cdot d\mathbf{S} ) (Faraday’s law; ( S ) fixed)</td>
</tr>
<tr>
<td>( \nabla \cdot \mathbf{D} = \rho )</td>
<td>( \oint \mathbf{D} \cdot d\mathbf{S} = \int_V \rho , dv ) (Gauss’ law)</td>
</tr>
<tr>
<td>( \nabla \cdot \mathbf{B} = 0 )</td>
<td>( \oint \mathbf{B} \cdot d\mathbf{S} = 0 ) (nonexistence of monopole)</td>
</tr>
</tbody>
</table>

Figure 4 Maxwell’s Equations

The second step that has to be taken, is that Confined Electromagnetic Waves have to be presented in a complex way comparable with the quantum mechanical probability function \( \psi \) and the complex conjugate function \( \psi^* \) in which the quantum mechanical probability density \( \psi \, \psi^* \) will be replaced by the electromagnetic mass density. This second step has been taken in an earlier publication (29) in which a complex notation for the electromagnetic field has been introduced in the equations (13), (14) and (15) on page 202, which has been published in 1995 in Physics.
In Ref (29) in equation (13) the vector function $\vec{\phi} = \vec{B} + i \vec{E} / c$ and the complex conjugate vector function $\bar{\vec{\phi}} = \bar{\vec{B}} - i \bar{\vec{E}} / c$ have been introduced in which $\vec{B}$ is the magnetic induction vector, $\vec{E}$ the electric field intensity vector and $c$ the speed of light. Equation (14) represents the dot product $\vec{\phi} \cdot \bar{\vec{\phi}}^* = \vec{B}^2 + \vec{E}^2 / c^2 \sim w$ which is proportional to the electromagnetic energy density $w$ and according to Einstein’s equation $W = m c^2$ proportional to the electromagnetic mass density $\rho$. The cross product $\vec{\phi} \otimes \bar{\vec{\phi}}^*$ in equation (15) is proportional to the momentum of the confined single harmonic electromagnetic radiation.

The third step that has to be taken, is to provide evidence that the well-known “de Broglie” waves are solutions of the “Electromagnetic Continuity Equation” for “Confined Single Harmonic Electromagnetic Waves” with one single harmonic Frequency $\omega_0$. And that the Quantum Mechanical Schrödinger Wave Equation is a complex notation presented in Ref. (29) in equation (55) on page 208 in which the complex notation for the Electromagnetic Continuity Equation has been presented which turns out to be identical to the well known Quantum Mechanical Schrödinger Wave Equation. This has been published in 1995 in Physics Essays in A Continuous model of Matter (DOI: 10.13140/RG.2.2.25149.77281). (ref. 29)

The fourth step that has to be taken, is to provide evidence that the well-known “de Broglie” waves at relativistic velocities are solutions of the “Electromagnetic Continuity
Equation” for “Confined Single Harmonic Electromagnetic Waves” with one single harmonic Frequency $\omega_0$. And that the Quantum Mechanical Dirac Equation is a complex notation for the Electromagnetic Continuity Equation for confined single harmonic electromagnetic waves. This evidence has been presented in Ref. (29) in equation (102) on page 213 in which the complex notation for the Electromagnetic Continuity Equation has been presented which turns out to be identical to the well-known Quantum Mechanical Dirac Equation at relativistic velocities. This has been published in 1995 in Physics Essays in A Continuous model of Matter (DOI: 0.13140/RG.2.2.25149.77281). (ref. 29)

The famous eclipse expedition of 1919 to Sobral, Brazil, and the island of Principe, in the Gulf of Guinea, led by Dyson, Eddington and Davidson was a turning point in the acceptance of the General Theory of Relativity developed by Albert Einstein in 1915. The correctness of this theory has been proven since then in many experiments. The success of his predictions made Einstein famous. Albert Einstein published his famous “Einstein Field Equations” (Einstein-Maxwell equations) in 1915, which were the mathematical foundation on which the Theory of General Relativity has been built. Einstein built his theory together with Hermann Minkowski using the complex 4-dimensional Minkowski Space and Hendrik Antoon Lorentz using the Electromagnetic Lorentz Transformations, developed by Hendrik Antoon Lorentz.
In this manuscript, the starting point is almost 300 years ago. Long before James Maxwell published his Maxwell equations, before Albert Einstein published the Theory of General Relativity and far before the time Niels Bohr introduced the probability waves, discovered by Erwin Schrödinger which were the nonlogical grounds on which Quantum Physics has been built.

The starting point is the moment just after Isaac Newton had published the breaking of light into the colors of the rainbow through a prism in *The Lectiones Opticae*” in 1728. Newton just had discovered the beauty of light when light had revealed one of its many secrets. And he could only express: ”Light is beautiful”.

When we return back to the world of light, we simply have to ask one question to the light. How is it possible that the light in our world does exist? And we simply follow Newtons third law of equilibrium published in the “*Principia Mathematica Philisophiae Naturalis*” in 1686.

This single fundamental only question has been asked: What are the fundamental boundaries which are required for a stable electromagnetic field configuration in which light can exist? And instead of taking the 4 well-known electromagnetic low frequency equations and put them together and find exactly the same results as James Maxwell has found, a different path has been chosen. There is only one boundary condition. “*The electromagnetic field has to be in a perfect equilibrium (balance) with itself and its surrounding.*” And when an electromagnetic field interacts with a gravitational field, *exactly the same boundary*
condition is required. That is the single and only requirement. From this single requirement follows one single equation. Equation (5) (gravity excluded) and Equation (5-a) (gravity included) in this manuscript.

All the solutions for electromagnetic configurations that are solutions of the Maxwell Equations are also solutions of Equation (5). But because of the special mathematical structure of Equation (5) and (5-a) other electromagnetic field configurations are possible which are non-linear solutions of (5) and (5-a). And this will have an impact on our understanding of the universe, on our understanding of light. Because we cannot understand the universe until we understand light.

John Archibald Wheeler (1) introduced in 1953 the concept of GEONS (Gravitational ElectrO-magnetic eNtities) in which electromagnetic radiation has been confined by its own gravitational field. To calculate the dimensions of these gravitational-electromagnetic confinements J. Wheeler based his calculations on the Einstein-Maxwell equations, the mathematical ground on which the Theory of General Relativity has been built and found electromagnetic-gravitational confinements with a diameter of several lightyears and a lifetime of several milliseconds. The results were very disappointing because an elementary particle with a diameter of several lightyears and a lifetime of a few milliseconds can hardly be considered as an elementary particle.

In the presented theory the electromagnetic-gravitational interaction has been grounded on Newton’s
third law. It has been grounded on the stability of electromagnetic-gravitational fields in a perfect equilibrium with itself and its surrounding. In table 1, electromagnetic-gravitational confinements have been presented for any harmonic (sinusoidal) frequency with an infinite lifetime and diameters varying from $<10^{-40}$ and $>10^{+40}$ [m] based on equation 5-a in a spherical coordinate system.

Because this fundamental approach in electromagnetic field configurations is different than the classical approach by J. Maxwell and A. Einstein, a different result is expected. Instead of electromagnetic-gravitational confinements with a diameter of several lightyears and a lifetime of several milliseconds, presented by J. Wheeler in 1953, electromagnetic-gravitational confinements have been presented in Table 1 with diameters varying from $<10^{-40}$ [m] and $>10^{+40}$ [m] and an infinite lifetime for any harmonic frequency based on equation (5-a).
4. Newton’s Third law generalized for Electromagnetic Radiation

In a way comparable to the way that GEONS (Gravitational ElectrO-magnetic eNtities) are described by J. Wheeler in General Relativity by the Gravitational-Electromagnetic Equilibrium Equation \(^{(1,7,8,13,35,38)}\) (the Einstein-Maxwell Equations), Electromagnetic Confinements are described by the Dynamic Equilibrium Equation (5).

Newton’s Third law has been generalized in all layers of Physics. There is no reason not to generalize Newton’s third law also within electromagnetic fields. To generalize Newton’s third law within Electromagnetic Field Configurations, the Divergence has been taken of the Stress Energy Tensor (3), which results in Equation (4) to calculate the force densities \(f\) within the Electromagnetic Field Configuration.

The Energy Momentum Tensor\(^{(9)}\) equals:

\[
T^{ab} = \frac{1}{\mu_0} \left[ F_{ac} F^{cb} + \frac{1}{4} \partial_{ab} F_{cd} F^{cd} \right]
\]  \(\text{(1)}\)

In which \(F_{ab}\) are the elements of the Maxwell Tensor defined by:

\[
F_{ab} = \partial_b \varphi_a - \partial_a \varphi_b
\]  \(\text{(2)}\)

The four-vector potential \(\varphi_a\) is defined by: \(\varphi_a = \{i \varphi / c, \vec{A}\}\)

where \(\varphi\) is the electric scalar potential, \(c\) the speed of light in vacuum and \(\vec{A}\) is the magnetic vector potential\(^{(1,2,3)}\).
Substituting (2) in (1) results in the Stress Energy Tensor \((1,16,29)\):

\[
T_{ab} = \begin{pmatrix}
    w & \frac{i}{c} S_x & \frac{i}{c} S_y & \frac{i}{c} S_z \\
    \frac{i}{c} S_x & \varepsilon_0(E_x)^2 + \mu_0(H_y)^2 - w & \varepsilon_0 E_x E_y + \mu_0 H_y H_z & \varepsilon_0 E_x E_z + \mu_0 H_y H_z \\
    \frac{i}{c} S_y & \varepsilon_0 E_x E_y + \mu_0 H_y H_z & \varepsilon_0(E_y)^2 + \mu_0(H_z)^2 - w & \varepsilon_0 E_y E_z + \mu_0 H_z H_z \\
    \frac{i}{c} S_z & \varepsilon_0 E_x E_z + \mu_0 H_y H_z & \varepsilon_0 E_y E_z + \mu_0 H_z H_z & \varepsilon_0(E_z)^2 + \mu_0(H_z)^2 - w
\end{pmatrix}
\] (3)

In the absence of any Gravity, the force density \(f^a\) in the 3 directions of the 3 coordinates of the chosen 3-coordinate system follows from the (4-dimensional) Divergence of the (4-dimensional) Stress Energy Tensor \((8,9,38)\) (3).

The Divergence of a Vector equals a Scalar. The Divergence of a Tensor equals a Vector. The 4-dimensional Divergence of the 4-dimensional Stress Energy Tensor equals the 4-dimensional Force-density Vector. The first 3 terms of the 4-dimensional Force-density vector equal the force densities in the corresponding 3 dimensions of the chosen Coordinate System. The 4\(^{th}\) component equals the Electromagnetic Poynting’s Theorhem.

To calculate the equilibrium conditions in the Electromagnetic Field Configuration, the first 3 terms of the 4-dimensional Force-density vector are being used.
By re-arranging the first 3 terms of the (4-dimensional Divergence) of the (4-dimensional) Stress Energy Tensor (4) an equation for the 3-dimensional force density \( f^a \) within the Electromagnetic Field Configuration has been created. This Equation (4) represents the 3-dimensional force density \( f^a \) in a coordinate-free vector equation in the absence of any Gravity:

\[
- \frac{1}{c^2} \frac{\partial (\vec{E} \times \vec{H})}{\partial t} + \varepsilon_0 \vec{E} \cdot (\nabla \cdot \vec{E}) - \varepsilon_0 \vec{E} \times (\nabla \times \varepsilon_0 \vec{E}) + \\
+ \mu_0 \vec{H} \cdot (\nabla \cdot \vec{H}) - \mu_0 \vec{H} \times (\nabla \times \vec{H}) = \vec{f} \tag{4}
\]

According Newton’s third law, the force density \( \vec{f} \) has to equal zero for any physical possible electromagnetic configuration (free radiation or confinement). According Newton’s third law it is the only required and sufficient boundary condition that the force densities in the 3 dimensions of the chosen coordinate system equal zero at any space at any time.

An electromagnetic field which is in a perfect equilibrium with itself and its surrounding at any space and time, fulfills the necessary requirements of Newton’s third law for the physical possibility of the existence of this field. Under that condition vergelijking (4) transforms into the Dynamic Equilibrium Equation (5), which expresses the force density equals the vector zero of an electromagnetic field on itself and its surrounding in a perfect equilibrium.

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The part of the Dynamic Equilibrium Equation \(^{(7,8,9,20)}\), (DEE) (5), representing the equilibrium for the force densities in the 3 directions of the chosen coordinate system equals the resulting REM equation:

\[
- \frac{1}{c^2} \frac{\partial (\vec{E} \times \vec{H})}{\partial t} + \varepsilon_0 \vec{E} \cdot (\nabla \cdot \vec{E}) - \varepsilon_0 \vec{E} \times (\nabla \times \vec{E}) + \mu_0 \vec{H} \cdot (\nabla \cdot \vec{H}) - \mu_0 \vec{H} \times (\nabla \times \vec{H}) = 0
\]

Substituting the well-known 4 Maxwell Equations in vacuum into (5) results in:

\[
- \varepsilon_0 \mu_0 \frac{\partial (\vec{E} \times \vec{H})}{\partial t} + \varepsilon_0 \vec{E} \cdot (\nabla \cdot \vec{E}) - \varepsilon_0 \mu_0 \vec{E} \times (- \frac{\partial (\vec{H})}{\partial t}) + \mu_0 \vec{H} \cdot (\nabla \cdot \vec{H}) + \mu_0 \vec{H} \times (\varepsilon_0 \frac{\partial (\vec{E})}{\partial t}) = 0
\]  \( (5.1) \)

According Maxwell’s equations the electromagnetic field is divergence free. And (5.1) results in:

\[
- \varepsilon_1 \mu_0 \frac{\partial (\vec{E} \times \vec{H})}{\partial t} - \varepsilon_1 \mu_0 \vec{E} \times (- \frac{\partial (\vec{H})}{\partial t}) + \mu_0 \vec{H} \times (\varepsilon_0 \frac{\partial (\vec{E})}{\partial t}) = 0
\]  \( (5.2) \)

Equation 5.2 is a well-known vector identity and the left side also equals zero. Equation (5) is a much more powerful Equation than the four well-known 4 Maxwell Equations. Equation (5) includes all the 4 Maxwell Equations in vacuum. This implies that every solution of the 4 Maxwell Equations in vacuum is also a solution of Equation 5. But in contradiction to the solutions for the 4 Maxwell Equations there is no requirement that for Equation 5 the
The electromagnetic field has to be Divergence-Free. And in physics this is very often a fact. A laser beam with a Gaussian Intensity Division is never Divergence-free. But it is a perfect solution of Equation 5. Equation (5) offers unique possibilities for Electromagnetic Interactions and for Electromagnetic Confinements. And that powerful fact makes Equation 5 unique and will change the possibilities in the Electromagnetic Field Configurations dramatically.

The Relativistic Gravitational Electro Magnetic (RGEM) equation within a gravitational field \( g \) equals:

\[
\begin{align*}
- \frac{1}{c^2} \frac{\partial (\mathbf{E} \times \mathbf{H})}{\partial t} + \varepsilon_\varepsilon \mathbf{E} \cdot (\nabla \times \mathbf{E}) - \varepsilon_\mathbf{H} \times (\nabla \times \mathbf{E}) + \mu_\varepsilon \mathbf{H} \cdot (\nabla \times \mathbf{H}) - \\
- \mu_\mathbf{H} \times (\nabla \times \mathbf{H}) - \frac{1}{2} \varepsilon_\varepsilon^2 \mu_\varepsilon (\mathbf{E} \cdot \mathbf{E}) \quad \frac{\partial g}{\partial t} - \frac{1}{2} \varepsilon_\varepsilon^2 (\mathbf{H} \cdot \mathbf{H}) \quad \frac{g}{g} = \mathbf{0}
\end{align*}
\]
5. 1 EM Radiation within a Cartesian Coordinate System in the absence of gravity

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time follows from the dynamic equilibrium equation (5) and equals in Cartesian Coordinates \( \{x, y, z, t\} \) for the Electric Field Components \( e(x, y, z, t) \):

\[
\begin{pmatrix}
e_x \\
e_y \\
e_z
\end{pmatrix} =
\begin{pmatrix}
f(x, y) g \left( t - \left( \frac{K_1}{z} + 1 \right) z \sqrt{\varepsilon_0 \mu_0} \right) \\
0 \\
0
\end{pmatrix}
\]

(6)

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time follows from the dynamic equilibrium equation (5) and equals in Cartesian Coordinates \( \{x, y, z, t\} \) for the Magnetic Field Components \( m(x, y, z, t) \):

\[
\begin{pmatrix}
m_x \\
m_y \\
m_z
\end{pmatrix} =
\sqrt{\frac{\varepsilon_0}{\mu_0}}
\begin{pmatrix}
0 \\
f(x, y) g \left( t - \left( \frac{K_1}{z} + 1 \right) z \sqrt{\varepsilon_0 \mu_0} \right) \\
0
\end{pmatrix}
\]

(7)
In which $K_1$ is an arbitrary constant. For the divergence-free function $f(x, y) = 1$, the solutions (6) and (7) are also the solutions for the known Maxwell Equations. For the non-divergence-free functions $f(x, y)$, the solutions (6) and (7) are not solutions for the Maxwell Equations, which requires divergence-free electromagnetic waves, propagating with the speed of light $c = 1/\sqrt{\varepsilon_0 \mu_0}$, in the absence of any matter. But they are solutions of the Dynamic Equilibrium Equation (5) and clearly do exist in physics. Comparable with the projection of a slide with a beamer on a flat screen in the z-direction. In which the slide has an arbitrary intensity-division $f(x, y)$. The information $f(x, y)$ on the slide propagates with the speed of light $c = 1/\sqrt{\varepsilon_0 \mu_0}$ towards the screen in the z-direction in this example.
5. 1.1 Laser Beam with a Gaussian division in the x-y plane within a Cartesian Coordinate System in the absence of gravity

The required **Electromagnetic Field Configuration** for a perfect Equilibrium in Space and Time follows from the dynamic equilibrium equation (5).

![Figure 5. Electromagnetic Field Intensity with a Gaussian division](image)

The required **Electromagnetic Field Configuration** equals in Cartesian Coordinates \( \{x, y, z, t\} \) for the Electric Field Components \( e(x, y, z, t) \) :
The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time follows from the dynamic equilibrium equation (5) and equals in Cartesian Coordinates \( \{x, y, z, t\} \) for the Magnetic Field Components \( m(x, y, z, t) \):

\[
\begin{align*}
\begin{pmatrix} e_x \\ e_y \\ e_z \end{pmatrix} &= \begin{pmatrix} K_1 e^{-K_2 (x^2+y^2)} \sin \left( \omega \left(t - z \sqrt{\varepsilon_0 \mu_0} \right) \right) \\ 0 \\ 0 \end{pmatrix} \\
\begin{pmatrix} m_x \\ m_y \\ m_z \end{pmatrix} &= \sqrt{\frac{\varepsilon_0}{\mu_0}} \begin{pmatrix} 0 \\ K_1 e^{-K_2 (x^2+y^2)} \sin \left( \omega \left(t - z \sqrt{\varepsilon_0 \mu_0} \right) \right) \\ 0 \end{pmatrix}
\end{align*}
\]

In which \( K_1 \) is an arbitrary constant. The Gaussian division is not a solution of the Maxwell Equations, because the divergence of the Electric field intensity does not equal zero

\[
\nabla \cdot \left( e \cdot K_1 K_2 \sin \left( \left(t - z \sqrt{\varepsilon_0 \mu_0} \right) \omega \right) \right)
\]

And the divergence of the Magnetic field intensity does not equal zero.
\[ \nabla \cdot \frac{\varepsilon_0}{\mu_0} \left( 2 e^{K_2(x^2+y^2)} y K_1 K_2 \sin \left( t - z \sqrt{\varepsilon_0 \mu_0} \omega \right) \right) \] (7.1)

For the non-divergence-free functions

\[ f(x, y) = K_1 e^{-K_2(x^2+y^2)} \sin \left( \omega \left( t - z \sqrt{\varepsilon_0 \mu_0} \right) \right) , \]

the solutions (6) and (7) are not solutions for the Maxwell Equations, which requires divergence-free electromagnetic waves, propagating with the speed of light \( c = 1/\sqrt{\varepsilon_0 \mu_0} \), in the absence of any matter. But they are solutions of the Dynamic Equilibrium Equation (5) and clearly do exist in physics. Comparable with the projection of a slide with a beamer on a flat screen in the z-direction. In which the slide has an arbitrary intensity-division \( f(x, y) \) and the intensity is not Divergence Free. The information \( f(x, y) \) on the slide propagates with the speed of light \( c = 1/\sqrt{\varepsilon_0 \mu_0} \) towards the screen in the z-direction in this example and is a real physical possibility and is not a solution of the Maxwell equations but is a solution of the Dynamic Equilibrium Equation (5) and clearly do exist in physics.
5.2 EM Radiation within a Cartesian Coordinate System under the influence of a Longitudinal Gravitational Field $g$

The required **Electromagnetic Field Configuration** for a perfect Equilibrium in Space and Time for a Longitudinal Gravitational Field (The Light propagates in the same z-direction as the z-direction of the Gravitational Field) follows from the **Dynamic Equilibrium Equation (5)** and equals in Cartesian Coordinates $\{x, y, z, t\}$ for a gravitational field “$g$” for the Electric Field Components $e(x, y, z, t)$:

$$\begin{pmatrix}
e_x \\
e_y \\
e_z
\end{pmatrix} = \begin{pmatrix}
e^{-\frac{1}{2} g t \sqrt{\varepsilon_0 \mu_0}} f(x, y) g\left(t - z \sqrt{\varepsilon_0 \mu_0}\right) \\
0 \\
0
\end{pmatrix}$$  \hfill (6-a)

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time for a Longitudinal Gravitational Field (The Light propagates in the same z-direction as the z-direction of the Gravitational Field) follows from the Dynamic Equilibrium Equation (5-a) and equals in Cartesian Coordinates $\{x, y, z, t\}$ for a gravitational field “$g$” for the Magnetic Field Components $m(x, y, z, t)$:
\[
\begin{pmatrix}
  m_x \\
  m_y \\
  m_z
\end{pmatrix}
= \sqrt{\frac{\varepsilon_0}{\mu_0}} \begin{pmatrix}
  0 \\
  -\frac{1}{2} g \varepsilon_0 \mu_0 z \\
  f(x, y) g(t - z \sqrt{\frac{\varepsilon_0}{\mu_0}})
\end{pmatrix}
\]  
(7 - a)

Equation (6-a) and (7-a) are solutions of (5-a) under the influence of a Longitudinal Gravitational field with field intensity “\(g\)” that acts along the z-direction while the electromagnetic wave is also propagating in the z-direction.

The electromagnetic wave is propagating with the unaltered speed of light \(c = 1 / \sqrt{\varepsilon_0 \mu_0}\), independently of the strength \(g\) of the gravitational field in the z-direction. However, the amplitude of the electromagnetic wave becomes dependently of the gravitational intensity “\(g\)” and the distance “\(z\)” and changes along the z-axis with the electromagnetic-gravitational interaction term \(e^{-\frac{1}{2} g \varepsilon_0 \mu_0 z}\).

In this example is chosen for e.g. a laser beam positioned vertically on the ground on earth, shining vertically against the gravitational field “\(g\)” of the earth. Because the laser beam presents electromagnetic energy, the beam has electromagnetic mass. The potential energy of the electromagnetic mass is increasing while the laser light is propagating upwards, against the direction of the gravitational field. Because of the law of conservation of Energy, the electromagnetic energy is decreasing over a distance “\(z\)” proportional with the same amount \(e^{-g \varepsilon_0 \mu_0 z}\).
as the potential energy of the electromagnetic mass is increasing.
5. 3 The Real Light Intensity of the Sun, measured in our Solar System, including Electromagnetic Gravitational Conversion (EMGC)

When a beam of light leaves the surface of the sun, the light will travel in the radial direction of the radial gravitational field caused by the sun. The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time for a Radial Gravitational Field (The Light propagates in the same radial-direction as the radial-direction of the Gravitational Field) follows from the Dynamic Equilibrium Equation (5) and equals in Spherical Coordinates \( \{r, \theta, \varphi, t\} \) for a gravitational field “g(r)” for the Electric Field Components

\[ e(r, \theta, \varphi, t) : \]

\[
\begin{pmatrix}
  e_r \\
  e_\theta \\
  e_\varphi
\end{pmatrix}
= \begin{pmatrix}
  \frac{1}{r} e^{-\frac{Gm_i \varepsilon_0 \mu_0}{2r}} K1 \ g \left( t - r \sqrt{\varepsilon_0 \mu_0} \right) \\
  0 \\
  0
\end{pmatrix}
\]

(6-b)

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time for a Radial Gravitational Field (The Light propagates in the same radial-direction as the radial-direction of the Gravitational Field) follows from the Dynamic Equilibrium Equation (5) and equals in Spherical Coordinates \( \{r, \theta, \varphi, t\} \) for a gravitational field “g(r)” for the Magnetic Field Components \( m(r, \theta, \varphi, t) : \)
\[
\begin{pmatrix}
m_x \\
m_y \\
m_z
\end{pmatrix} = \sqrt{\frac{\varepsilon_0}{\mu_0}} \begin{pmatrix}
1 & Gm_s \varepsilon_0 \mu_0 & 0 \\
-\frac{Gm_s}{r} & \frac{e^{-Gm_s \varepsilon_0 \mu_0}}{2r} & K1 \cdot g(t - r \sqrt{\varepsilon_0 \mu_0}) \\
0 & 0 & 0
\end{pmatrix} (7 - b)
\]

Equation (6-b) and (7-b) are solutions of (5-a) under the influence of a Radial Gravitational field with field a gravitational field intensity “g(r)” that acts along the radial-direction while the electromagnetic wave is also propagating in the radial-direction.

When a light beam leaves the surface of the sun, the intensity will decrease according (6-b). At earth, the measured intensity will be according (5-a) and (6-b):

\[
I = I_0 \frac{Gm_s \varepsilon_0 \mu_0}{4 \pi r^2} (6-c)
\]

A beam of light represents an amount of electromagnetic energy. Which equals an amount of electromagnetic mass. This amount of electromagnetic mass is moving with the speed of light in the opposite direction of a (radial) gravitational field and gains potential energy. Because the law of conservation of energy, a part of the electromagnetic energy of the light beam has to be converted into potential energy according equation (6-c).
For a radius of the sun equals 695,508 [km] and a distance from the sun to the earth of 149,600,000 [km], the Electromagnetic Gravitational Conversion (EMGC) term equals:

\[
C_{EMGC} = \frac{G m_1 \varepsilon_0 \mu_0}{e \frac{\eta}{r^2}} = \frac{1}{e^{\frac{\eta}{r^2}}} = 4.1877534 \quad (6-d)
\]

This means that the real intensity of the light at the surface of the sun is about 4 times higher than the intensity which would have been calculated in a classical way from the
sunlight intensity measured on earth, due to Electromagnetic Gravitational Conversion.

Equations (6-b) and (7-b) are solutions of (5-a) under the influence of a Radial Gravitational field with field intensity “g(r)” that acts along the radial-direction while the electromagnetic wave is also propagating in the same radial-direction. The electromagnetic wave is propagating with the unaltered speed of light \( c = 1 / \sqrt{\varepsilon_0 \mu_0} \), independently of the strength g(r) of the gravitational field in the radial-direction. However, the amplitude of the electromagnetic wave becomes dependently of the gravitational intensity “g(r)” and the distance “r” and changes along the radial direction due to the Electromagnetic-Gravitational Conversion term

\[
C_{EMGC} = e^{\frac{G m_i \varepsilon_0 \mu_0}{r}}
\]

Because of the law of conservation of Energy, the electromagnetic energy of the light emitted by the sun is decreasing over a distance “r” proportional with the same amount \( EmGC = e^{\frac{G m_i \varepsilon_0 \mu_0}{r}} \) as the potential energy of the electromagnetic mass of the light emitted by the sun is increasing.
5.4 The Boundaries of our Universe

When a mass, for example a ball, has been thrown into the air, the mass moves against the direction of the gravitational field of the earth and kinetic energy has been converted into potential energy. When the ball has reached the maximum height, the ball falls back towards the earth and the potential energy has been converted again into kinetic energy. The total sum of kinetic energy and potential energy remains constant.

The Cosmic Microwave Background Radiation (CMBR) is light (electromagnetic radiation) and represents an amount of electromagnetic energy. Which equals an amount of electromagnetic mass. This amount of electromagnetic mass is moving with the speed of light in the opposite direction of a (radial) gravitational field and gains potential energy. Because the law of conservation of energy, a part of the electromagnetic energy of the light beam has to be converted into potential energy according equation (6-c).

In a comparable way the Cosmic Microwave Background Radiation (CMBR) (light, electromagnetic) radiation moves away from the center of our Universe, gaining Potential Energy by moving against the (Radial) Gravitational field of our Universe. Until the Intensity of the light vanishes into zero at the boundaries of our Universe and has the potency to fall back towards its origin gaining an non-imaginable amount of light intensity by the conversion of potential energy into electromagnetic energy.
In this model of the Universe, the electromagnetic radiation within the universe, is locked up in its own gravitational field. And the whole Universe can be considered to be a gigantic Black Hole with a diameter over 5 billion lightyears.

Depending on the the electromagnetic stability at the boundaries of our Universe a periodic model of our Universe is possible like the ball being thrown into the air and falling back towards the location where it came from, or the universe finally disappearing into the infinite space.

These possibilities depend on the radial dependent electromagnetic intensity function of the Cosmic Microwave Background Radiation (CMBR) \( \text{Table 1} \).
### 5.5 The Origin of Dark Matter

The Cosmic Microwave Background Radiation (CMBR) is the dominant radiation field in the Universe, and one of the most powerful cosmological tools that has yet been found, 25 years after its discovery by Penzias & Wilson (1965).

Within a few years of the discovery of the CMBR, it was established the radiation field is close to isotropic, with a spectrum characterized by a single temperature, $T_{\text{rad}} \approx 2.7$ K. The specific intensity of the radiation is therefore close to:

\[
I_f = \frac{2}{c^2} \frac{h f^3}{e} \left( e^{hf/k_b T_{\text{rad}}} - 1 \right)^{-1}
\]

which corresponds to a peak brightness $I_{\text{max}} \sim 3.7 \times 10^{-18}$ W m$^{-2}$ Hz$^{-1}$ sr$^{-1}$ at $f_{\text{max}} \sim 160$ GHz and an energy density $i_f \sim 4 \times 10^{-14}$ J m$^{-3}$, which can also be expressed as a mass density $\rho_{\text{em}} \sim 5 \times 10^{-31}$ kg m$^{-3}$.

When from the earth an Electromagnetic Mass Density has been measured which equals $\rho_{\text{em}} = 5 \times 10^{-36}$ kg/m$^3$, the Total Mass of the Universe can be roughly calculated without and with regarding the effect of Electromagnetic Gravitational Conversion.

At the Origin of the Universe, at the start of the Big Bang, a large amount of electromagnetic radiation has been blown into the universe, which has been measured on earth as the
well-known CMBR. The radiation, traveling for billions of years against the gravitational field of the origin of the universe and has gained during that time an enormous amount of potential energy. Because of the conversation of energy and the transfer of electromagnetic energy into potential energy, the intensity of the CMBR, measured on earth, has been much lower than the real intensity has been at the origin.

As an example a visible universe like a sphere has been chosen with a radius of $4.4 \times 10^{26}$ [m] and the earth located in the middle between the origin of the Big Bang and the outer boundaries of the visible Universe. As an example, two basic calculations have been done. The first one, calculating the total electromagnetic mass in the universe without taking into account the Electromagnetic-Gravitational Interaction.

$$M_{\text{UNIVERSE}} = \int_{R_e}^{R_i} \rho_{EM} 4 \pi r^2 \, d\, r = \int_{0.0113}^{4.4 \times 10^{26}} \frac{5 \times 10^{-36}}{(r / 2.2 \times 10^{26})^2} 4 \pi r^2 \, d\, r = 1.338 \times 10^{45} \, [\text{kg}]$$

The second calculation has been done by taking into account the Electromagnetic-Gravitational Interaction, including the Electromagnetic-Gravitational Conversion term $C_{\text{EMGC}} = e^\frac{G m_e}{r} e_{\mu_0}^\mu$.

$$M_{\text{UNIVERSE}} = \int_{R_e}^{R_i} \rho_{EM} \frac{1}{e^r} 4 \pi r^2 \, d\, r = \int_{0.0113}^{4.4 \times 10^{26}} \frac{5 \times 10^{-36}}{(r / 2.2 \times 10^{26})^2} \frac{1}{e^{r / 2.2 \times 10^{26}}} 4 \pi r^2 \, d\, r = 1.077 \times 10^{53} \, [\text{kg}]$$
Including the effect of Electromagnetic-Gravitational Conversion changes an almost negligible effect of the CMBR on the total mass of the Universe into an effect that can easily explain the total mass of the Universe while neglecting the influences of the mass of the galaxies. And makes the Theory of Dark Matter avoidable.
6. Electromagnetic Radiation within a Spherical Coordinate System

The Spherical Coordinate System \( \{r, \theta, \varphi, t\} \) is parameterized by the radius \( r \) of the Sphere, the polar angle \( \theta \) and the azimuthal angle \( \varphi \) and the time \( t \).

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time follows from equation (5) and equals in Spherical Coordinates \( \{r, \theta, \varphi, t\} \) for the Electric Field Components \( e(\theta, r, \varphi, t) \):

\[
\begin{pmatrix}
e_r \\
e_\theta \\
e_\varphi
\end{pmatrix} = \begin{pmatrix}
1 \\
0 \\
0
\end{pmatrix} \cdot f(\theta, \varphi) \cdot g\left( t - \left( \frac{K}{r} + 1 \right) r \sqrt{\varepsilon_0 \mu_0} \right)
\]

(8)

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time follows from
equation (4) and equals in Spherical Coordinates \( \{r, \theta, \varphi, t\} \) for the Magnetic Field Components \( m(\theta, r, \varphi, t) \):

\[
\begin{pmatrix}
m_r \\
m_\theta \\
m_\varphi \\
\end{pmatrix} = \sqrt{\frac{\varepsilon_0}{\mu_0}} \begin{pmatrix}
0 \\
0 \\
\frac{1}{r} f(\theta, \varphi) g \left( t - \left( \frac{K}{r} + 1 \right) r \sqrt{\frac{\varepsilon_0}{\mu_0}} \right)
\end{pmatrix}
\]

(9)

For the divergence-free function \( f(\theta, \varphi) = 1 \), the solutions (8) and (9) are also the solutions for the known Maxwell Equations. For the non-divergence-free functions \( f(\theta, \varphi) \), the solutions (8) and (9) are no solutions for the Maxwell Equations, which require divergence-free electromagnetic waves in the absence of any matter.\(^{(29,35,36,37,38)}\). They are however solutions of the DEE (5) and clearly they do exist in physics. Like the radiation of an inhomogeneous point light source like a LED.
7. Confined Electromagnetic Radiation within a Spherical Coordinate System through Electromagnetic-Gravitational Interaction

In physics it has been in generally assumed that the speed of light \( c = 1 / \sqrt{\varepsilon \mu} \) is a physical constant. In this paragraph the possibilities will be discussed of a variable speed of light \(^{10,11,12}\) that can vary from zero until values higher than \( c \). The only requirement for the existence of an Electromagnetic Field Configuration will be the requirement of a perfect equilibrium in space-time for the chosen electromagnetic field configuration\(^ {13,14,15}\). This single unique requirement will always be a solution of the DEE \((5)\).

The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time\(^ {16,17,18,30,31,39}\) in respectively the : \( \theta \)-direction \( (f_{\theta} = 0) \) and the \( \phi \)-direction \( (f_{\phi} = 0) \) follows from equation \((5)\).

In Spherical Coordinates \( \{r, \theta, \varphi, t\} \) the solution for the DEE \((5)\) for the Electric Field Components \( e(\theta, r, \varphi, t) \) equals:

\[
\begin{pmatrix}
  e_r \\
  e_{\theta} \\
  e_{\phi}
\end{pmatrix} = \begin{pmatrix}
  0 \\
  f(r) g(\theta) h(\varphi) \sin(\omega t) \\
  -f(r) g(\theta) h(\varphi) \cos(\omega t)
\end{pmatrix}
\] (10)
In Spherical Coordinates \( \{r, \theta, \varphi, t\} \) the solution for the DEE (5) for the Magnetic Field Components \( m(\theta, r, \varphi, t) \) in respectively the : \( \theta \)-direction \((f_\theta = 0) \) and the \( \varphi \)-direction \((f_\varphi = 0) \) for the magnetic field components follows from equation (5) \((29,30,31)\). and equals:

\[
\begin{pmatrix}
m_r \\
m_\theta \\
m_\varphi \\
\end{pmatrix} = \begin{pmatrix}
0 \\
f(r) g(\theta) h(\varphi) \cos(\omega t) \\
f(r) g(\theta) h(\varphi) \sin(\omega t)
\end{pmatrix}
\tag{11}
\]

Equation (4) gives the 3-dimensional force density \( f^a \) of an Electro-Magnetic Field Configuration\((19,20,21)\). in a coordinate free vector equation.

\[
\begin{pmatrix}
f_r \\
f_\theta \\
f_\varphi \\
\end{pmatrix} = \begin{pmatrix}
\frac{2}{r} \varepsilon_0 \, g(\theta)^2 h(\varphi)^2 f(r) \left( f(r) + r \frac{d f(r)}{d r} \right) \\
0 \\
0
\end{pmatrix}
\tag{12}
\]

It follows from equation (4) that the radiation pressure in radial direction does not counterbalance and does not equal zero.

The energy-density \( w_m \) of the Electromagnetic Configuration is essential for the calculation of the inward bounded gravitational pressure. The electromagnetic field
configuration (10) and (11) for the functions \( g(\theta) = 1 \) and \( h(\phi) = 1 \), results into the electromagnetic energy-density \( w_{em} \):

\[
\begin{bmatrix}
    e_r \\
    e_\theta \\
    e_\phi
\end{bmatrix} = \begin{bmatrix}
    f(r) \sin(\omega t) \\
    0 \\
    -f(r) \cos(\omega t)
\end{bmatrix}
\]

\[
\begin{bmatrix}
    m_r \\
    m_\theta \\
    m_\phi
\end{bmatrix} = \begin{bmatrix}
    f(r) \cos(\omega t) \\
    0 \\
    f(r) \sin(\omega t)
\end{bmatrix}
\]

\[
w_{em} = \left( \frac{\mu_0}{2} \overrightarrow{m} \cdot \overrightarrow{m} \right) + \frac{\varepsilon_0}{2} \left( \overrightarrow{e} \cdot \overrightarrow{e} \right) = \varepsilon_0 f(r)^2
\]

According to Einstein’s mass-energy equivalent \( W = m c^2 \), the specific electromagnetic mass equals:

\[
\rho_{em} = \frac{1}{c^2} \left( \frac{\mu_0}{2} \overrightarrow{m} \cdot \overrightarrow{m} + \frac{\varepsilon_0}{2} \left( \overrightarrow{e} \cdot \overrightarrow{e} \right) \right) = \varepsilon_0 \mu_0 f(r)^2
\]

The total electromagnetic mass within a sphere with radius \( R \) equals:

\[
M_{em} = 4 \pi \varepsilon_0 ^2 \mu_0 \int_0^R f(r)^2 \, dr
\]

At a distance \( r \) from the center of the sphere, the total electromagnetic mass \( M_{em} \) within the sphere causes, according to Newton’s Shell Theorem, a gravitational field strength \( g_{em} \):
\[ g_{em} = \frac{4}{r^2} \pi \epsilon_0^2 \mu_0 G_1 \int_0^R r^2 f(r)^2 \, dr \]  

(16)

In which \( G_1 \) is the gravitational constant and equals \( G_1 = 6.67408 \times 10^{-11} \, [\text{m}^3 \, \text{kg}^{-1} \, \text{s}^{-2}] \). The gravitational inwards bounded radiation pressure \((29,31,32,33)\), follows from (16):

\[ f_{\text{GRAV}} = \frac{\rho_{em} g_{em}}{\rho_{rad}} = \frac{4}{r^2} \pi \epsilon_0^4 \mu_0^2 G_1 f(r)^2 \int_0^R r^2 f(r)^2 \, dr \]  

(17)

When there is a perfect equilibrium between the outwards bounded electromagnetic radiation pressure \( f_{\text{RAD}} \) and the inward bounded gravitational pressure \((29,34,35,38,39)\), \( f_{\text{GRAV}} \) we find from (12) and (17) the radius of the boundary sphere of the enclosed radiation \( R_{\text{BOUNDARY}} \). for the functions \( g(\theta) = 1 \) and \( h(\varphi) = 1 \),

\[ f_{\text{RAD}} = \frac{2}{r} \epsilon_0 f(r) \left( f(r) + r \frac{df(r)}{dr} \right) = \]  

(18)

\[ = \frac{4}{r^2} \pi \epsilon_0^4 \mu_0^2 G_1 f(r)^2 \int_{R_{\text{BOUNDARY}}} r^2 f(r)^2 \, dr = f_{\text{GRAV}} \]

In the following example we choose for the function \( f(r) \)

\[ f(r) = K \, r^n \]  

(19)
Substituting (19) in (18) results in the equation for \( R_{\text{BOUNDARY}} \):

\[
\frac{8.019056 \times 10^{-94}}{3+2n} K1^6 R_{\text{BOUNDARY}}^{1+6n} = 1.7708376 \times 10^{11} K1^2 (1 + n) R_{\text{BOUNDARY}}^{-1+2n}
\]

(20)
<table>
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<tr>
<th>Values for n</th>
<th>Values for $K_1$</th>
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<th>Area</th>
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Electromagnetic Particle (Electromagnetically Controlled)
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8. The fundamental conflict between Causality and Probability

The beginning of the conflict between Causality and Probability in Physics started at the historic invitation-only “Conseil Solvay” in 1911. Since that conference Albert Einstein has always defended the fundamental concept of Causality and the logical grounds for Causality and Effect while Niels Bohr has always defended the fundamental concept of Probability in which there is no relationship between Causality and Effect. The most fundamental and famous conference was the October 1927 “Fifth Solvay International Conference on Electrons and Photons” where the newly formulated Quantum Theory, based on Probability, had been accepted. Since then Quantum Physics has grown in power and has always been grounded on the material waves, for the first time mathematically described by Erwin Schrödinger and designated to be probability waves.

In Ref. (29) page 206 the “law of continuity” for electromagnetic radiation has been presented in equation (42), By presenting the electromagnetic field in a complex configuration in equation (48) on page 207, the electromagnetic continuity equation (42) has been presented as the quantum mechanical Schrödinger wave equation (53) on page 207. However the function \( \psi \) in (53) does not represent the quantum mechanical probability function but represents the confined electromagnetic field with harmonic frequency \( \omega_0 \) in which the magnetic part has been presented as the real function \( \frac{\mathbf{B}}{\mu} \) and the electric part has been
presented as the imaginary function $i \frac{E}{c}$. With “i” the imaginary number $\sqrt{-1}$. However as well as the electric part as the magnetic part of the confined electromagnetic field are both real.

The quantum mechanical wave function $\psi$ is in real a vector function $\vec{\phi}$ which equals:

$$\vec{\phi} = \frac{1}{\sqrt{2} \mu} \left( \vec{\bar{B}} + i \frac{\vec{E}}{c} \right)$$  \hspace{1cm} (21.a)

and the complex conjugated vector function $\vec{\phi}^*$ equals:

$$\vec{\phi}^* = \frac{1}{\sqrt{2} \mu} \left( \vec{\bar{B}} - i \frac{\vec{E}}{c} \right)$$  \hspace{1cm} (21.b)

And the dot product equals the electromagnetic energy density $w$:

$$\vec{\phi} \cdot \vec{\phi}^* = \frac{1}{2 \mu} \left( \vec{\bar{B}} + i \frac{\vec{E}}{c} \right) \cdot \left( \vec{\bar{B}} - i \frac{\vec{E}}{c} \right) = \frac{1}{2} \mu H^2 + \frac{1}{2} \varepsilon E^2 = w$$  \hspace{1cm} (21.c)

The cross product is proportional to the Poynting vector (ref. 29, page 202, equation 15).

$$\vec{\phi} \times \vec{\phi}^* = \frac{1}{2 \mu} \left( \vec{\bar{B}} + i \frac{\vec{E}}{c} \right) \times \left( \vec{\bar{B}} - i \frac{\vec{E}}{c} \right) = i \sqrt{\varepsilon \mu} \vec{E} \times \vec{H} = i \sqrt{\varepsilon \mu} \vec{S}$$  \hspace{1cm} (21.d)

In Ref. (29) on page 208 the “law of continuity” for electromagnetic radiation has been presented in equation (57). The vector function $\vec{\phi}$ represents the confined electromagnetic field with harmonic frequency $\omega_0$ in which the magnetic part has been presented as the real vector
function $\vec{B}$ and the electric part has been presented as the imaginary vector function $i \vec{E} / c$. By substituting the complex vector function $\vec{\phi}$ in (57) and using the relativistic Lorentz transformations, the quantum mechanical relativistic Dirac equation has been derived in equation (102) on page 213. This has been published in 1995 in Physics Essays in *A Continuous model of Matter* (DOI: 10.13140/RG.2.2.25149.77281). (ref. 29).

This fundamental conflict is still going on and in this article mathematical results are presented in Table 1 in which the famous De Broglie waves, the material waves, designated as probability waves are electromagnetic waves with one harmonic frequency $\omega$, confined by electromagnetic-gravitational interaction. Electromagnetic waves fully grounded on Causality and Effect.

Table 1 presents several values for the calculated Equilibrium Radius $R_{\text{BOUNDARY}}$ (20) at different values $K_1$ and $n$ in Equation (18), (19) and (20) for the harmonic Electromagnetic-Gravitationally confined Electromagnetic waves with frequency $\omega_0$:
9. Confined Electromagnetic Radiation within a Toroidal Coordinate System

The Toroidal Coordinate System \( \{\theta, r, \varphi, R, t\} \) is parameterized by the large radius \( R \) of the Torus. The Toroidal Coordinate System is obtained by rotating bipolar coordinates \( \{r, \varphi\} \) around an axis perpendicular to the axis connecting the two foci. The coordinate \( \{\theta\} \) specifies the angle of rotation.
The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time equals in Toroidal Coordinates \( \{\theta, r, \varphi, t\} \) for the Electric Field Components \( e_{(\theta, r, \varphi, t)} \).

\[
\begin{pmatrix}
e_{\theta} \\
e_{r} \\
e_{\varphi}
\end{pmatrix} = \begin{pmatrix}
\frac{1}{\sqrt{2}} \text{Csch}(r)(\text{Cosh}(r) - \text{Cos}(\theta))^{3/2} \sqrt{K1 - f_{11}(\theta, r, \varphi, t)^2} \\
\sqrt{h(\theta) - 2\text{Cot}(\theta)\text{Tan}^{-1}\left(\text{Tan}\left(\frac{\theta}{2}\right)\text{Coth}\left(\frac{r}{2}\right)\right) + r} \\
\sqrt{-K2 + \frac{1}{2} \text{Cos}(\theta)\left(h(\theta) - 2\text{Cot}(\theta)\text{Tan}^{-1}\left(\text{Tan}\left(\frac{\theta}{2}\right)\text{Coth}\left(\frac{r}{2}\right)\right) + r\right) + h(\theta)} \\
\end{pmatrix}
\]

(22.a)
The required Electromagnetic Field Configuration for a perfect Equilibrium in Space and Time equals in Toroidal Coordinates \( \{ \theta, r, \varphi, t \} \) for the Magnetic Field Components \( m(\theta, r, \varphi, t) \).

\[
\begin{pmatrix}
  m_\theta \\
  m_r \\
  m_\varphi
\end{pmatrix}
= \frac{\varepsilon_0}{\sqrt{\mu_0}} \begin{pmatrix}
  \frac{-1}{\sqrt{2}} \text{Csch}(r)(\text{Cosh}(r) - \text{Cos}(\theta))^{3/2} f_i(\theta, r, \varphi, t) \\
  \sqrt{h(\theta) - 2\text{Cot}(\theta) \text{Tan}^{-1}\left(\text{Tan}\left(\frac{\theta}{2}\right) \text{Coth}\left(\frac{r}{2}\right)\right) + r} \\
  \frac{\text{Csch}(r) (\text{cosh}(r) - \text{cos}(\theta))}{\sqrt{K_1 - f_i(\theta, r, \varphi, t)^2}} \sqrt{-K_2 + \frac{1}{2} \text{Cos}(\theta) \left(h(\theta) - 2\text{Cot}(\theta) \text{Tan}^{-1}\left(\text{Tan}\left(\frac{\theta}{2}\right) \text{Coth}\left(\frac{r}{2}\right)\right) + r\right) + h(\theta)} \\
  -\frac{1}{2} \text{Cosh}(r) \left(h(\theta) - 2\text{Cot}(\theta) \text{Tan}^{-1}\left(\text{tan}\left(\frac{\theta}{2}\right) \text{coth}\left(\frac{r}{2}\right)\right) + r\right) + \text{Sinh}(r)
\end{pmatrix}
\]
10. Confined Electromagnetic Radiation within a Toroidal Coordinate System through Electromagnetic-Gravitational Interaction in a non-linear Space-Time Continuum

The required Electromagnetic Field Configuration for a Gravitational-Electromagnetic Equilibrium in Space and Time equals in Toroidal Coordinates \( \{\theta, r, \varphi, t\} \) for the Electric Field Components \( e(\theta, r, \varphi, t) \):

\[
\begin{bmatrix}
  e_{\theta} \\
  e_r \\
  e_{\varphi}
\end{bmatrix}^{(0)} = 
\begin{bmatrix}
  \left( \text{Csch}(r) f_{1}(0, r) (\cosh(r) - \cos(\theta))^{3/2} \sqrt{K1 - f_{13}(0, r, \varphi, t)^2} \right) \\
  \left( \text{Csch}(r) (\cosh(r) - \cos(\theta)) f_{13}(0, r, \varphi, t) \right) \\
  \sqrt{\cos(\theta) f_{1}(0, r)^2 - \cosh(r) f_{1}(0, r)^2 - g(r)}
\end{bmatrix}
\]

The required Electromagnetic Field Configuration for a Gravitational-Electromagnetic Equilibrium in Space and Time equals in Toroidal Coordinates \( \{\theta, r, \varphi, t\} \) for the Magnetic Field Components \( m(\theta, r, \varphi, t) \):

\[
\begin{bmatrix}
  m_{\theta} \\
  m_r \\
  m_{\varphi}
\end{bmatrix} = 
\begin{bmatrix}
  \sqrt{\varepsilon} \\
  m_r = \sqrt{\mu_c} \\
  m_{\varphi}
\end{bmatrix}^{(0)} = 
\begin{bmatrix}
  \left( \text{Csch}(r) f_{1}(0, r) \left( - (\cosh(r) - \cos(\theta))^{1/2} \right) f_{13}(0, r, \varphi, t) \right) \\
  \left( \text{Csch}(r) (\cosh(r) - \cos(\theta)) \right) \\
  \sqrt{\cos(\theta) f_{1}(0, r)^2 - \cosh(r) f_{1}(0, r)^2 - g(r) \sqrt{K1 - f_{13}(0, r, \varphi, t)^2}}
\end{bmatrix}
\]

The toroidal electromagnetic field configuration is in perfect equilibrium with itself and its surrounding in...
respectively the $\theta$- and the $\varphi$- direction. There is a resulting electromagnetic outward bounding force density in the $r$-direction, \( \overrightarrow{j}(\varphi, r, \theta, t) \) indicated as the outward bounding radiation pressure of the toroidal electromagnetic confinement.

\[
\begin{pmatrix}
0 \\
\varepsilon K \text{Csch}^2(r) (\cos(\theta) - \cosh(r))^2 f_1(\theta, r) (\cos(\theta) - \cosh(r)) - g'(r) \\
2R \\
0
\end{pmatrix}
\]  

This resulting outward bounding radiation pressure has to be compensated by the inward bounding gravitational force density, to create the required equilibrium by electromagnetic-gravitational interaction.

In a comparable way as in the example presented in spherical coordinates in (13) and (14), the electromagnetic mass-density from the energy density in the torus can be calculated. With these values the inward bounded gravitational radiation pressure can be derived. From the requirement that both force densities have to compensate each other, the Boundary Radius \( R_{\text{BOUNDARY}} \) for the toroidal confinement can be calculated.
11. The Origin of Electromagnetic Mass (Inertia)

When Erwin Schrödinger published in 1926 the well-known Schrödinger wave equation with the characteristic spherical and elliptical wave solutions, he found a mathematical presentation for “De Broglie-” or the Material Waves. When Bohr assigned these “De Broglie” waves as “Probability Waves”, he excluded ”De Broglie-Waves” from any mass. The mass was for 100 % in the elementary particle itself and “De Broglie Waves” without any mass described the probability of the position of this elementary particle. A complete non logical approach.

A fundamental logical approach is to assign the mass to “De Broglie Waves”. And that is only possible when we “De Broglie Waves” are just “Confined Single Harmonic Electromagnetic Waves” (confined light). For this reason the mass of confined electromagnetic radiation has to be calculated. It will be clear that it is impossible to assign mass to free electromagnetic radiation. Because it is impossible to accelerate free electromagnetic radiation and the concept of mass if based on the inertia of mass by Newton’s second law. For this reason the inertia of “Confined Single Harmonic Electromagnetic Waves” (confined light) has to be calculated.

We measure the mass in [kg] by acceleration of the object according Newton’s second law of motion. In the theory of special relativity, the speed of light is a fundamental constant. But the intensity of the light will not be constant. Speed is relative. When we emit by a laser a beam of light, the intensity of the light will not change with the distance (without any divergence of the beam).
However there is a difference. When the speed of the observer has the same speed as the speed of the light source, then the observer and the light source are relative at rest. And the same light intensity will be measured at the location of the emitter and at the location of the observer.

When the observer moves towards the emitter, the intensity of the light at the location of the observer will increase with $\gamma (1 + v / c)$ according the Lorentz transformation in which “$v$” is the relative velocity between emitter and observer. At low velocities the term $\gamma$ will equal 1.

When the observer moves away from the emitter, the intensity of the light at the location of the observer will decrease with $\gamma (1 - v / c)$ according the Lorentz transformation. At low velocities the term $\gamma$ will equal 1.

When light is confined between two 100 % reflecting mirrors, then we can conclude that the speed of both mirrors will always be equal, relative to each other. And at uniform speed, the radiation pressures on both mirrors will be equal and both opposite directed radiation pressures will neutralize.

During acceleration, it will take time for the light to travel with the speed of light between both mirrors. When we consider one mirror as the emitter and the opposite mirror as the observer, we can conclude that the speed of the emitter will be different (when the beam of light leaves the emitter) than the speed of the observer (when the beam of light reaches the observer) because of the time interval, needed for the beam of light to propagate from emitter to observer during the acceleration.
During the acceleration, both opposite oriented radiation pressures on both mirrors will not be equal anymore and they will not neutralize each other anymore. During acceleration, there will be a resulting force according Newton’s second law of motion caused by both different radiation pressures.

For the first step in this calculation an imaginary experiment has been used. Two 100 % reflecting mirrors B and A (both in the x-y plane and without any mass) are placed opposite each other at a distance $\Delta x$ (ref 29, page 7, figure 1). A single harmonic electromagnetic wave has been confined between both mirrors. Between both mirrors a “Standing Electromagnetic Wave” appears which has been formed by two waves travelling in opposite directions along the z-axis.

The Poynting vector corresponding with the electromagnetic wave propagating along the z-axis in the + direction (positive direction of the z-axis) has been indicated as $\mathbf{S}^+ = \mathbf{E}^+ \times \mathbf{H}^+$ and the Poynting vector corresponding with the electromagnetic wave propagating along the z-axis in the - direction (opposite direction) has been indicated as $\mathbf{S}^- = \mathbf{E}^- \times \mathbf{H}^-$.

The system is at rest. The radiation pressures, caused by the confined electromagnetic radiation, on both mirrors A and B are opposite and equal in magnitude:

$$P_A = \frac{2}{c} S_A = \frac{2}{c} S_B = P_B \quad (26)$$
Einstein has formulated this very well. “Velocities are always relative”. To calculate the radiation pressure on Mirror A, the velocities, only relative to Mirror A for the waves with the respective Poynting vectors

\[ \overline{S}^+ = \overline{E}^+ \times \overline{H}^+ \quad \text{and} \quad \overline{S}^- = \overline{E}^- \times \overline{H}^- , \]

have to be calculated.
11.1.1 The radiation pressure on Mirror A, when Mirror A moves with a velocity v in the direction of the positive z-axis

When the system of “Two Mirrors B - A” moves in the direction of the positive z-axis, Mirror A moves in the direction of the positive z-axis and the Poynting vector \( \mathbf{S}^+ = \mathbf{E}^+ \times \mathbf{H}^+ \) will decrease according the Lorentz transformation (ref. 29, page 23, A-57).

\[
\mathbf{S}_v^+ = \mathbf{E}_v^+ \times \mathbf{H}_v^+ = \gamma^2 \left( 1 - \frac{v}{c} \right)^2 \left( \mathbf{E}^+ \times \mathbf{H}^+ \right)
\]

(27)

When the system of “Two Mirrors B - A” moves in the direction of the positive z-axis, Mirror A moves in the direction of the positive z-axis the Poynting vector \( \mathbf{S}^- = \mathbf{E}^- \times \mathbf{H}^- \) will increase according the Lorentz transformation (ref. 29, page 222, A-57).

\[
\mathbf{S}_v^- = \mathbf{E}_v^- \times \mathbf{H}_v^- = \gamma^2 \left( 1 + \frac{v}{c} \right)^2 \left( \mathbf{E}^+ \times \mathbf{H}^+ \right)
\]

(28)

The total radiation pressure, caused by the confined electromagnetic radiation, on mirror A equals:

\[
P_A = \frac{S_A^+ + S_A^-}{c} = \gamma^2 \left( \left( 1 - \frac{v}{c} \right)^2 + \left( 1 + \frac{v}{c} \right)^2 \right) \left( \frac{\mathbf{E}^+ \times \mathbf{H}^+}{c} \right)
\]

(29)
11.1.2 The radiation pressure on Mirror B when Mirror B moves with a velocity $v$ in the direction of the positive $z$-axis

When the system of “Two Mirrors B - A” moves in the direction of the positive $z$-axis, Mirror B moves in the direction of the positive $z$-axis and the Poynting vector $\vec{S}^- = \vec{E}^- \times \vec{H}^-$ will increase according the Lorentz transformation (ref. 29, page 23, A-57).

$$\vec{S}_v^- = \vec{E}_v^- \times \vec{H}_v^- = \gamma^2 \left(1 + \frac{v}{c}\right)^2 \left(\vec{E}^+ \times \vec{H}^+\right)$$ (30)

When the system of “Two Mirrors B - A” moves in the direction of the positive $z$-axis, Mirror A moves in the direction of the positive $z$-axis the Poynting vector $\vec{S}^+ = \vec{E}^+ \times \vec{H}^+$ will increase according the Lorentz transformation (ref. 29, page 23, A-57).

$$\vec{S}_v^+ = \vec{E}_v^+ \times \vec{H}_v^+ = \gamma^2 \left(1 - \frac{v}{c}\right)^2 \left(\vec{E}^+ \times \vec{H}^+\right)$$ (31)

The total radiation pressure, caused by the confined electromagnetic radiation, on mirror B equals:

$$P_A = \frac{S_A^+ + S_A^-}{c} = \frac{\gamma^2 \left(\left(1 + \frac{v}{c}\right)^2 + \left(1 - \frac{v}{c}\right)^2\right) \left(\vec{E}^+ \times \vec{H}^+\right)}{c}$$ (32)
$P_A$ and $P_B$ are still equal in magnitude and both in opposite direction and still cancel each other. The system fulfils Newton’s first law of motion.
11.2 Newton’s second Law of Motion (Inertia) for Confined Electromagnetic Radiation

When the system of “Two Mirrors B - A” accelerates, the velocity increases with $\Delta v$ in a time interval $\Delta t$. At time $t$ the radiation pressures on mirror A and mirror B are presented in (29) and (32). At time $t + \Delta t$ the radiation pressures on Mirror A and Mirror B will different:

The radiation pressure at time $t + \Delta t$ caused by the confined electromagnetic radiation, on mirror A equals:

$$p_A = \frac{S_A^+ + S_A^-}{c} = \frac{\gamma^2 \left( \left(1 + \frac{v}{c}\right)^2 + \left(1 - \frac{v + \Delta v}{c}\right)^2 \right) \left(\mathbf{E}^+ \times \mathbf{H}^+\right)}{c}$$

(33)

Because the wave with Poynting vector $\mathbf{S}^+ = \mathbf{E}^+ \times \mathbf{H}^+$ has left Mirror B at “t” and during the time interval $\Delta t$ the magnitude of $\mathbf{E}_i^+ = \left(1 + \frac{v}{c}\right)\mathbf{E}^+$ and $\mathbf{H}_i^+ = \left(1 + \frac{v}{c}\right)\mathbf{H}^+$ has not changed.

The radiation pressure at time $t + \Delta t$ caused by the confined electromagnetic radiation, on mirror B equals:

$$p_B = \frac{S_B^+ + S_B^-}{c} = \frac{\gamma^2 \left( \left(1 + \frac{v + \Delta v}{c}\right)^2 + \left(1 - \frac{v}{c}\right)^2 \right) \left(\mathbf{E}^+ \times \mathbf{H}^+\right)}{c}$$

(34)
Because the wave with Poynting vector \( \vec{S} = \vec{E} \times \vec{H} \) has left Mirror A at “t” and during the time interval \( \Delta t \) the magnitude of \( \vec{E}_t = \left(1 + \frac{v}{c}\right)\vec{E} \) and \( \vec{H}_t = \left(1 + \frac{v}{c}\right)\vec{H} \) has not changed.

The radiation pressures on Mirror A and Mirror B do not counterbalance each other anymore and the resulting radiation pressure equals:

\[
P_B - P_A = \frac{\gamma^2 \left(\frac{4}{c^2} \Delta v\right) S}{4} \quad \text{Equation (35)}
\]

Equation (35) can be written as:

\[
P_B - P_A = \frac{\gamma^2 \left(\frac{4}{c^2} \Delta v\right) S}{4} = \frac{\gamma^2 \left(4 \frac{\Delta v}{\Delta t}\right) S \Delta t}{c^2} = \gamma^2 \frac{W}{c^2} a = \gamma^2 ma \quad \text{(36)}
\]

In which the acceleration \( a = \frac{\Delta v}{\Delta t} \) and the inertia \( m = \frac{W}{c^2} \). At non relativistic velocities \( \gamma = 1 \) and (36) turns into the Newton’s second law of motion. From (36) also Einstein’s famous equation \( W = mc^2 \) follows. In (36) \( W \) is the total confined electromagnetic mass.

Now we can consider electromagnetic confinements without mirrors but electromagnetic confinements through electromagnetic gravitational interaction. By superposition and integration over arbitrary surfaces it is possible to prove that all confined electromagnetic radiation equals (36) and
has electromagnetic mass and follow Newton’s second law of motion.
12. Quantum Mechanical Entanglement

One of the first answers every Quantum Physicist will give you when you doubt the Holy Grail of the “Particle-Wave Duality” in Quantum Physics is Bell’s Theorem. But the “Particle-Wave Duality” can never explain the laws in Quantum Mechanics. In special the “Particle-Wave Duality” cannot explain “Entanglement”.

In the new model of the “Particle-Wave-Mass” Tri-Unity, the concept of a particle on itself has completely disappeared. A particle itself does not exist anymore. The “Particle-Wave-Mass” is a wave of confined light (Electromagnetic Radiation) with a “particle aspect” and a “mass aspect”. And sometimes we observe only one of the three aspects.

To demonstrate this, a simple model of a string in a music instrument like a piano, will be used. As soon the string has been excited, we will hear a tune (frequency spectrum). Along the string a pattern of “standing (stationary) transversal waves” occurs. When we observe one single harmonic frequency we observe that along the string a pattern occurs of nodes and anti-nodes occurs. The nodes as well as the anti-nodes are connected together in an “Entanglement” And because the information travels along the string simultaneously in both directions, it gives the impression that the information travels with an infinite speed. Because the sound wave in the string has been confined between the two ends of the string, Entanglement occurs.

Entanglement is only possible within the confinement of wave patterns. Because only then the wave pattern can mathematically be considered as the superposition of waves propagating in opposite directions and forming “standing
(stationary) waves” It does not matter if the “standing (stationary) waves” occur because of the confinement by the ends of the string or a confinement of an electromagnetic field due to “Electromagnetic-Gravitational Interaction”.

Now we consider the creation of an “electron-anti electron” pair. Both have been created at the same location. That is the exact location where the string has been excited in the example. When the electron-anti electron pair moves away from each other, it is still in the essence “one confined wave pattern”. And only through Gravitational-Electromagnetic Interaction this wave pattern has been confined and the area of confinement becomes only larger when both particles move apart. The electron/anti-electron pair is still one stationary confined harmonic electromagnetic wave pattern, which is the superposition of a complex nodes-anti nodes pattern. Confined by its own “Electromagnetic-Gravitational Field “Entanglement” will occur in a comparable way how it occurs in the string of a music instrument. Confinement is the necessary requirement for the existence of “Entanglement”.

Entanglement is the fundamental evidence that the “Particle-Wave Duality” in Classical Quantum Mechanics is not able to explain “Entanglement”. Particles can not be at the same place simultaneously. The weakness in Classical Quantum Mechanics is the “particle”. Not the “wave”. Modern experiments crumble down the “Particle-Wave-Duality” model of Niels Bohr more and more. How is it possible to make a photo of a complex probability wave? How is “Entanglement” possible? How can a photon create an electron/anti-electron pair?

Classical Quantum Physics needs a make-over. A new concept that does not crumble down further by every new
experiment. And the particle concept is the weakness in Classical Quantum Mechanics. We come closer and closer to the final conclusion that particles do not exist. “Elementary particles” is a concept that worked very well for the last 2000 years. But it does no work anymore. We have to give up a way of thinking in the way we are already thinking for more than 2000 years since Plato introduced the concept of “Elementary particle”.

Times are changing and it is time for us to leave the ancient safe roads of the Greek Philosophers and give up the safety of our illusions. It is time to move on and let the “particle” go.


And that is what I am offering. A new model without particles. In which the property of matter will be carried only by the wave. And the wave is already given to us since the creation of our Universe. The Light Wave. The Light Wave which carries the ability to confine itself and manifest itself like a particle. The Light wave which carries the ability to confine itself and manifest itself in the property of inertia and carries mass. The confined light wave that is in fundamental essence just only a wave but carries the 3-unity in itself of particle -wave – mass. The Particle-Wave-Mass 3-Unity.
13.1 A Gravitational-Electromagnetic model of the Superstring

Calculations in Mathematica 11.0 .nb file and in PDF file.

**Figure 2 First Image of the Hydrogen Atom’s Orbital structure**

In the presented Gravitational-Electromagnetic Model, elementary Particles, hadrons (electrons, positrons and neutrinos) do not exist. And Quantum Mechanical Probability waves do not exist. The Copenhagen Interpretation was a mistake in the history of Physics. A fundamental mistake in physics and Albert Einstein had warned for this mistake at the 1927 Solvay Conference.

The only real thing in Quantum Physics are the material waves. "De Broglie Waves". They are very real and do exist. Schrödinger" and as well Dirac both have written the simple well-known (electromagnetic) Continuity Equation (ref. 29, page 208, equation 57). in a complex form. But what they have really found are electromagnetic waves. Single harmonic and confined. The Schrödinger Solution of a Spherical Probability wave around the nucleus has been interpreted wrong. It is not a complex probability wave. It is a real electromagnetic wave in which the real part is the solution for the electric part and the imaginary part is the magnetic part, just written with an "i" index before the term.
The quantum mechanical wave function $\psi$ is in real a vector function $\vec{\phi}$ which equals:

$$\vec{\phi} = \frac{1}{\sqrt{2} \mu} \left( \vec{B} + i \frac{\overline{E}}{c} \right)$$

(37)

and the complex conjugated vector function equals:

$$\vec{\phi}^* = \frac{1}{\sqrt{2} \mu} \left( \vec{B} - i \frac{\overline{E}}{c} \right)$$

(38)

And the dot product equals the electromagnetic energy density $w$:

$$\vec{\phi} \cdot \vec{\phi}^* = \frac{1}{2 \mu} \left( \vec{B} + i \frac{\overline{E}}{c} \right) \cdot \left( \vec{B} - i \frac{\overline{E}}{c} \right) = \frac{1}{2} \mu H^2 + \frac{1}{2} \epsilon E^2 = w$$

(39)

The cross product is proportional to the Poynting vector (ref. 29, page 202, equation 15).

$$\vec{\phi} \times \vec{\phi}^* = \frac{1}{2 \mu} \left( \vec{B} + i \frac{\overline{E}}{c} \right) \times \left( \vec{B} - i \frac{\overline{E}}{c} \right) = i \sqrt{\mu} \epsilon \vec{E} \times \overline{H} = i \sqrt{\mu} \vec{S}$$

(39)

The Gravitational-Electromagnetic Confinement for the elementary structure of the “superstring” is presented in equation (5-a).

$$-\frac{1}{c^2} \frac{\partial (\vec{E} \times \overline{\eta})}{\partial t} + \epsilon_s \vec{E} (\nabla \cdot \vec{E}) - \epsilon_s \vec{E} \times (\nabla \times \vec{E}) + \mu_e \vec{H} (\nabla \cdot \overline{H}) - \mu_s \overline{H} \times (\nabla \times \overline{H}) - \frac{1}{2} \epsilon_s \mu_e \frac{\partial}{\partial t} (\vec{E} \cdot \overline{E}) - \frac{1}{2} (H \cdot H) \overline{g} = 0$$

(5-a)

In which $\overline{g}$ represents the (radial oriënted) gravitational acceleration caused by the electromagnetic mass density of the confined electromagnetic radiation.
The solution for equation (5-a) equals:

\[
\begin{pmatrix}
    e_r \\
    e_\theta \\
    e_\phi
\end{pmatrix} = \begin{pmatrix}
    0 \\
    f(r) \sin(\omega t) \\
    -f(r) \cos(\omega t)
\end{pmatrix}
\quad \quad \quad
\begin{pmatrix}
    m_r \\
    m_\theta \\
    m_\phi
\end{pmatrix} = \begin{pmatrix}
    0 \\
    f(r) \cos(\omega t) \\
    f(r) \sin(\omega t)
\end{pmatrix}
\]

(40)

\[
w_{en} = \left( \frac{\mu_0}{2} \bar{m} \cdot \bar{m} + \frac{\varepsilon_0}{2} \bar{e} \cdot \bar{e} \right) = \varepsilon_0 f(r)^2
\]

In which \( f(r) \) equals:

\[
f[r] = K e^{-\frac{G_1 \varepsilon_0 \mu_0}{r} + \frac{8 \pi \log[r]}{8 \pi}}
\]

(41)
13.1.1 A Gravitational-Electromagnetic Confinement Type 1
(emm = 10^{-4} [kg]; radius = 2 \times 10^{-35} [m]):

The chosen values equal:

\[ f(r) = K e^{-\frac{G1 \text{omm} \varepsilon_0 \mu_0}{r} + 8 \pi \log[r]} \]

\[ G1 = 6.6740810^{-11} \]
\[ \text{omm} = 10^{-4} \]
\[ \varepsilon_0 = 8.8510^{-12} \]
\[ \mu_0 = 1.256637061435917210^{-6} \]

In which “omm” equals the electromagnetic mass of the confinement located at the center according Newton’s Shell Theorem.

For an electromagnetic mass of the confinement type (1): \text{omm} = 10^{-4} [kg], the radius of the confinement equals approximately 2 \times 10^{-35} [m]. This is in the order of Planck’s Length.

The Plot graph of the Electric Field Intensity f( r ) of the confinement has been presented as a function of the radius in figure (7) and figure (8):
Figure 7  Plot of the Electric Field Intensity $f(r)$ for the region $10^{-36} < r < 10^{-25}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $10^{-4}$ [kg] located at the center of the confinement, according Newton’s Shell Theorem.
Figure 8 Plot of the Electric Field Intensity $f(r)$ for the region $10^{-36} < r < 10^{-35}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $10^{-4}$ [kg] located at the center of the confinement, according to Newton’s Shell Theorem.
It follows from Figure 8 that the radius of the stable gravitational electromagnetic confinement equals approximately $2 \times 10^{-35}$ [m], which is the size of the Planck length. According to the theory of superstrings, the fundamental constituents of reality are strings of the Planck length (about $1.62 \times 10^{-35}$ [m]) that vibrate at resonant frequencies.
13.1.2 A Gravitational-Electromagnetic Confinement Type 2
(emm $= 10^{-12}$ [kg]; radius $= 2.5 \times 10^{-43}$ [m]):

For an electromagnetic mass of the confinement type (2): emm $= 10^{-12}$ [kg], the radius of the confinement equals approximately $2.5 \times 10^{-43}$ [m]. This is much smaller than Planck’s Length and has been indicated as “sub Planck Length”.
The Plot graph of the Electric Field Intensity $f(r)$ of the confinement has been presented as a function of the radius in figure (9) and figure (10):

$$\text{Plot} \left[ - \frac{G_1 \varepsilon_0 \mu_0}{r} + 8 \pi \log[r] \right]$$

$$\left\{ r, 10^{-43}, 10^{-40} \right\}$$

Figure 9  PlotGraph of the Electric Field Intensity $f(r)$ for the region $10^{-36} < r < 10^{-25}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $10^{-4}$ [kg] located at the center of the confinement, according Newton’s Shell Theorem.
Figure 10  Plot Graph of the Electric Field Intensity $f(r)$ for the region $10^{-43} < r < 10^{-42}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $10^{-12}$ [kg] located at the center of the confinement, according Newton’s Shell Theorem.
13.1.3 A Gravitational-Electromagnetic Confinement Type 3

(emm = 1.6726 \times 10^{-27} [kg]; \text{radius} = 3 \times 10^{-58} [m]):

For an electromagnetic mass of the confinement type (3):

\text{emm} = 1.6726 \times 10^{-27} [kg] (mass of proton), the radius of the confinement equals approximately 3 \times 10^{-58} [m]. This is far beyond the order of Planck’s Length,

The \textbf{Plot graph} of the Electric Field Intensity \( f( r ) \) of the confinement has been presented as a function of the radius in figure (11) and figure (12):

\[ \text{Plot: } e^{-\frac{G1 \varepsilon_0 \mu_0}{r} + \frac{8 \pi \log[r]}{8 \pi}} \{ r, 10^{-59}, 10^{-55} \} \]

![Plot graph of Electric Field Intensity](chart.png)
Figure 11  PlotGraph of the Electric Field Intensity $f(r)$ for the region $10^{-59} < r < 10^{-55}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $1.6726 \times 10^{-27}$ [kg] located at the center of the confinement, according to Newton’s Shell Theorem.

\[
Plot \left[ -\frac{G \varepsilon_0 \mu_0}{r} + \frac{8 \pi \log[r]}{8 \pi}, \{r, 10^{-59}, 10^{-57}\} \right]
\]

Figure 12  PlotGraph of the Electric Field Intensity $f(r)$ for the region $10^{-59} < r < 10^{-57}$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $1.6726 \times 10^{-27}$ [kg] located at the center of the confinement, according to Newton’s Shell Theorem.
The fundamental question is: How it is possible to create confinements from “visible light” (with a wave length between $3.9 \times 10^{-7} \text{[m]}$ until $7 \times 10^{-7} \text{[m]}$) within dimensions smaller than Planck’s Length?

This is only possible when the wave length of the confined radiation is smaller than the dimensions of the confinement. This requires extreme high frequencies. The transformation in frequency from visible light into the extreme high frequency of the confinement is possible because of the Lorentz transformation during the collapse of the radiation when the confinement has been formed (implosion of visible light).
13.2 The Origin of Electric Charge and Magnetic Spin

The Gravitational-Electromagnetic Confinement for the elementary structure of the “superstring” is presented in equation (5-a).

\[-\frac{1}{c^2} \frac{\partial (E \times H)}{\partial t} + \epsilon_\nu \bar{E} (\nabla \cdot \bar{E}) - \epsilon_\nu E \times (\nabla \times \bar{E}) + \mu_\nu \bar{H} (\nabla \cdot \bar{H}) - \mu_\nu \bar{H} \times (\nabla \times \bar{H}) - \frac{1}{2} \epsilon_\nu^2 \mu_\nu \bar{E} \cdot \bar{E} - \frac{1}{2} \epsilon_\nu \mu_\nu^2 \bar{H} \cdot \bar{H} \bar{g} = \bar{0} \tag{5-a}\]

In which \(\bar{g}\) represents the (radial oriented) gravitational acceleration caused by the electromagnetic mass density of the confined electromagnetic radiation.

To find the origin of Electric Charge and Magnetic Spin we choose as an example the solution for equation (5-a) which equals:

\[
\begin{pmatrix}
e_r
\epsilon_\theta
\epsilon_\phi
\end{pmatrix} = \begin{pmatrix} 0 \\
f_1(r,\theta,\phi,t) \sin(\omega t) \\
f_2(r,\theta,\phi,t) \cos(\omega t) \end{pmatrix}
\]

\[
\begin{pmatrix} m_r \\
m_\theta \\
m_\phi \end{pmatrix} = \begin{pmatrix} 0 \\
f_2(r,\theta,\phi,t) \cos(\omega t) \\
f_1(r,\theta,\phi,t) \sin(\omega t) \end{pmatrix}
\]

\[
w_{em} = \left( \frac{H_0}{2} (\bar{m} \cdot \bar{m}) + \frac{\epsilon_0}{2} (\bar{e} \cdot \bar{e}) \right) = \epsilon_0 f(r)^2
\]

In which \(f[r], f_1[r,\theta,\phi,t], f_2[r,\theta,\phi,t]\) equals:
\[ f[r] = K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log r}{8 \pi}} \]

\[ f_1[r, \theta, \varphi, t] = K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log r}{8 \pi}} g_1[\theta, \varphi, t] \]

\[ f_2[r, \theta, \varphi, t] = K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log r}{8 \pi}} \sqrt{-g_1[\theta, \varphi, t]^2 + \cos[2\theta \omega] g_1[\theta, \varphi, t]^2 + 2h[\theta, \varphi]} \]

In which \( g_1[\theta, \varphi, t] \) and \( h[\theta, \varphi] \) are arbitrary function.

The “sub Max Planck’s length” confinement has been described for the electric field intensity:

\[
\begin{pmatrix}
\varepsilon_e \\
\varepsilon_0 \\
\varepsilon_\varphi
\end{pmatrix} = \begin{pmatrix}
0 \\
K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log(r)}{8 \pi}} g_1[\theta, \varphi, t] \sin[t \omega] \\
K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log(r)}{8 \pi}} \sqrt{-g_1[\theta, \varphi, t]^2 + \cos[2\theta \omega] g_1[\theta, \varphi, t]^2 + 2h[\theta, \varphi]} \\
\end{pmatrix} \tag{45}
\]

The “sub Max Planck’s length” confinement has been described for the magnetic field intensity:

\[
\begin{pmatrix}
m_r \\
m_\theta \\
m_\varphi
\end{pmatrix} = \begin{pmatrix}
0 \\
K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log(r)}{8 \pi}} \sqrt{-g_1[\theta, \varphi, t]^2 + \cos[2\theta \omega] g_1[\theta, \varphi, t]^2 + 2h[\theta, \varphi]} \\
K e^{-\frac{G_1 \varepsilon_0 \mu_0 + 8 \pi \log(r)}{8 \pi}} g_1[\theta, \varphi, t] \sin[t \omega]
\end{pmatrix} \tag{46}
\]
13.3 The 5 Types of "Sub Max Planck Length Gravitational-Electromagnetic Confinements" resulting in Electric Charge and Magnetic Spin

The following functions with the quantum variables \{m_1, n_1, p_1, q_1\} have been chosen:

\[
f[r] = K e^{-\frac{-G_1 \mu_0 + 8 \pi \log[r]}{8 \pi}}
\]

\[
g_1(\theta, \varphi, t) = \sin(t \omega) (\sin(\pi \theta m_1) \sin(n_1 2 \pi \varphi) + 1)
\]

\[
h(\theta, \varphi) = \sin(\pi \theta p_1) \sin(q_1 2 \pi \varphi) + 1
\]

\[
g_2(\theta, \varphi, t) = \frac{\sec(t \omega) \cos(2 t \omega) g_1(\theta, \varphi, t)^2 - g_1(\theta, \varphi, t)^2 + 2 h(\theta, \varphi)}{\sqrt{2}}
\]

\[
f_1[r, \theta, \varphi, t] = e^{-\frac{-G_1 \mu_0 + 8 \pi \log[r]}{8 \pi}} K g_1[\theta, \varphi, t]
\]

\[
f_2[r, \theta, \varphi, t] = e^{-\frac{-G_1 \mu_0 + 8 \pi \log[r]}{8 \pi}} K \sqrt{-g_1[\theta, \varphi, t]^2 + \cos[2 t \omega]g_1[\theta, \varphi, t]^2 + 2h[\theta, \varphi]} \]
13.3.1 Type 1 of "Sub Max Planck Length Gravitational-Electromagnetic Confinements" (Electric- and Magnetic Dipoles, Electric- and Magnetic Spin) {m1=0, n1=0, p1=0, q1=0}

The divergence of the electric field intensity (electric charge density) equals:

\[
\nabla \cdot \begin{pmatrix} e_r \\ e_\theta \\ e_\phi \end{pmatrix} = \frac{\sqrt{2} K_1 \cot(\theta) \sin^2(t \omega) \sqrt{1 - \sin^4(t \omega)} e^{G_i \varepsilon_0 \mu_0}}{r^2 \sqrt{2 - 2 \sin^4(t \omega)}} \frac{G_i \varepsilon_0 \mu_0}{8 \pi r} \tag{48}
\]

The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\phi \end{pmatrix} = \frac{K_1 \varepsilon_0 \cot(\theta) \sqrt{2 - 2 \sin^4(t \omega)}}{\sqrt{2} \sqrt{\mu_0 \mu_\phi}} \frac{G_i \varepsilon_0 \mu_0}{8 \pi r} e^{G_i \varepsilon_0 \mu_0} \tag{49}
\]

In which K1 is an arbitrary variable. Because of the \(\cot(\theta)\) function, the electric divergence as well as the magnetic divergence changes from sign when the angle \(\theta\) varies.
between $0^0$ until $360^0$ forming electric dipoles (+ versus -) and magnetic dipoles (N versus S).
13.3.2 Type 2 of "Sub Max Planck Length Gravitational-Electromagnetic Confinements" (Electric- and Magnetic Dipoles, Electric- and Magnetic Spin) \{m1=1, n1=0, p1=0, q1=0\}

The divergence of the electric field intensity (electric charge density) equals:

\[
\nabla \cdot \begin{pmatrix} e_r \\ e_\theta \\ e_\varphi \end{pmatrix} = \sqrt{2} K_1 \cot(\theta) \sin^2(\theta \omega) \sqrt{1 - \sin^4(\theta \omega)} \frac{G_1 \varepsilon_0 \mu_0}{r^2 \sqrt{2 - 2 \sin^4(\theta \omega)}} e^{\frac{G_1 \varepsilon_0 \mu_0}{8 \pi r}} (50)
\]

\[
\begin{align*}
\nabla \cdot \begin{pmatrix} e_r \\ e_\theta \\ e_\varphi \end{pmatrix} &= \frac{1}{2} K_1 \cot(\theta) \frac{G_1 \varepsilon_0 \mu_0}{8 \pi r} \\
&= \frac{1}{2} K_1 \cot(\theta) \frac{G_1 \varepsilon_0 \mu_0}{8 \pi r} (\text{averaged over 1 period of time})
\end{align*}
\]

The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\begin{align*}
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\varphi \end{pmatrix} &= K_1 \sqrt{2} \cot(\theta) \sqrt{2 - 2 \sin^4(\theta \omega)} e^{\frac{G_1 \varepsilon_0 \mu_0}{8 \pi r}} \frac{G_1 \varepsilon_0 \mu_0}{\sqrt{\mu_0} r^2} \\
&= K_1 \sqrt{2} \cot(\theta) \sqrt{2 - 2 \sin^4(\theta \omega)} e^{\frac{G_1 \varepsilon_0 \mu_0}{8 \pi r}} \frac{G_1 \varepsilon_0 \mu_0}{\sqrt{\mu_0} r^2} (\text{averaged over 1 period of time})
\end{align*}
\]

In which K1 is an arbitrary variable. Because of the \( \cot(\theta) \) function, the electric divergence as well as the magnetic divergence changes from sign when the angle \( \theta \) varies.
between $0^0$ until $360^0$ forming electric dipoles (+ versus -) and magnetic dipoles (N versus S).
13.3.3 Type 3 of ”Sub Max Planck Length Gravitational-Electromagnetic Confinements” \( \{m_1=1, n_1=1, p_1=0, q_1=0\} \)

The divergence of the electric field intensity (electric charge density) equals:

\[
\begin{align*}
\nabla \cdot \begin{pmatrix} e_r \\ e_\theta \\ e_\varphi \end{pmatrix} &= \frac{G_1 \epsilon_0 \mu_0}{8 \pi r} \left( \frac{\cos(\varphi)(\sin(\theta) \sin(\varphi) + 1) \sin^2(t \omega)}{r^2 \sqrt{1 - (\sin(\theta) \sin(\varphi) + 1)^2 \sin^2(t \omega)}} \right) + \\
&\quad \left( 2 \cos(\theta) \sin(\varphi) + \cot(\varphi) \right) \sqrt{1 - (\sin(\theta) \sin(\varphi) + 1)^2 \sin^2(t \omega)} \\
&= \frac{K_1 \sin^2(t \omega) \epsilon_0 \mu_0}{8 \pi r} \left( \frac{1}{2} \frac{\cos(\varphi)(\sin(\theta) \sin(\varphi) + 1)}{r^2 1 - \frac{1}{4} (\sin(\theta) \sin(\varphi) + 1)^2} \right) + \\
&\quad \left( 2 \cos(\theta) \sin(\varphi) + \cot(\theta) \right) \sqrt{1 - \frac{1}{4} (\sin(\theta) \sin(\varphi) + 1)^2} \quad (\text{averaged over 1 period of time})
\end{align*}
\]

(52)
The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\phi \end{pmatrix} = -K_1 \sqrt{\epsilon_0} e^{G_1 e_0} \frac{G_1 e_0 \mu_0}{s \pi r} \left( \frac{\sin(\theta) \sin^4(t \omega) \sin(2 \theta \sin(\theta))}{\sqrt{1 - (\sin(\theta) \sin(\theta) + 1)^2 \sin^4(t \omega)}} \right) + \\
K_1 \sqrt{\epsilon_0} e^{G_1 e_0} \frac{G_1 e_0 \mu_0}{s \pi r} \left( 3 \cos(\theta) + \cos(\phi) \sin^2(t \omega) \sqrt{1 - (\sin(\theta) \sin(\theta) + 1)^2 \sin^4(t \omega) - \cot(\theta) \left( \sin^4(t \omega) - 1 \right)} \right) \sqrt{\mu_0} r^2 \sqrt{1 - (\sin(\theta) \sin(\theta) + 1)^2 \sin^4(t \omega)}
\]

(53)

\[
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\phi \end{pmatrix} = -K_1 \sqrt{\epsilon_0} e^{G_1 e_0} \frac{G_1 e_0 \mu_0}{s \pi r} \left( \frac{\sin(\theta) \sin^4(t \omega)}{1 - \frac{1}{4} (\sin(\theta) \sin(\phi) + 1)^2} \right) + \\
K_1 \sqrt{\epsilon_0} e^{G_1 e_0} \frac{G_1 e_0 \mu_0}{s \pi r} \left( \frac{1}{2} \cos(\theta) \sqrt{1 - \frac{1}{4} (\sin(\theta) \sin(\phi) + 1)^2 + \frac{3}{4} \cot(\theta)} \right) \sqrt{\mu_0} r^2 \sqrt{1 - \frac{1}{4} (\sin(\theta) \sin(\phi) + 1)^2}
\]

(averaged over 1 period of time)

In which K1 is an arbitrary variable with a Positive (positive charge) or a Negative (negative charge) value.
13.3.4 Type 4 of "Sub Max Planck Length Gravitational-Electromagnetic Confinements" (Electric- and Magnetic Dipoles, Electric- and Magnetic Spin) 

\{m_1=0, n_1=0, p_1=1, q_1=0\}

The divergence of the electric field intensity (electric charge density) equals:

\[
\nabla \cdot \begin{pmatrix}
  e_r \\
  e_\theta \\
  e_\phi
\end{pmatrix} = \frac{G_e \varepsilon_0 \mu_0}{8 \pi r^2} K_1 \cot[\theta] \sin[t\omega]^2
\]

(54)

\[
\nabla \cdot \begin{pmatrix}
  e_r \\
  e_\theta \\
  e_\phi
\end{pmatrix} = \frac{G_e \varepsilon_0 \mu_0}{8 \pi r^2} \frac{K_1 \cot[\theta]}{2} \text{ (averaged over 1 period of time)}
\]

In which K1 is an arbitrary variable with a Positive (positive charge) or a Negative (negative charge) value.

Figure 9. Equation (54). Averaged over 1 period of time. Electric Charge Density Plot in a range from 10^{-37} [m] until 10^{-35} [m].
The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\varphi \end{pmatrix} = \frac{G_1 \varepsilon_0 \mu_0}{8 \pi t} K_1 \sqrt{\varepsilon_0} \cot[\theta] \sqrt{1 - \sin(2\omega)^4} \left( \frac{1}{r^2 \sqrt{\mu_0}} \right)
\]

(55)

\[
\nabla \cdot \begin{pmatrix} m_r \\ m_\theta \\ m_\varphi \end{pmatrix} = \frac{G_1 \varepsilon_0 \mu_0}{8 \pi t} K_1 \sqrt{\varepsilon_0} \cot[\theta] \frac{1}{2 r^2 \sqrt{\mu_0}}
\]

(averaged over 1 period of time)

In which K1 is an arbitrary variable. Because of the \( \cot(\theta) \) function, the electric divergence as well as the magnetic divergence changes from sign when the angle \( \theta \) varies between \( 0^0 \) until \( 360^0 \) forming electric dipoles (+ versus -) and magnetic dipoles (N versus S).
13.3.5 Type 5 of ”Sub Max Planck Length Gravitational-Electromagnetic Confinements” \{m1=0, n1=0, p1=1, q1=1\}

The divergence of the electric field intensity (electric charge density) equals:

\[
\nabla \cdot \left( \frac{e_r e_\theta}{r} \right) = \frac{G_1 e_0 \mu_0}{8 \pi r} K_1 \left( 2 \cot[\theta] \sin[\omega] \left[ \cos[\varphi] \sqrt{1 + \sin[\theta] \sin[\varphi] - \sin[\omega]^2} \right] \right) - \frac{1}{2 \pi r^2}
\]

(56)

The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\nabla \cdot \left( \frac{m_r m_\theta}{r^2} \right) = \frac{G_1 e_0 \mu_0}{8 \pi r} K_1 \left( \cot[\theta] \left[ \cos[\varphi] \sqrt{\frac{3}{4} + \sin[\theta] \sin[\varphi]} \right] \right)
\]

(averaged over 1 period of time)

(57)

In which \( K_1 \) is an arbitrary variable with a Positive (positive charge) or a Negative (negative charge) value.
13.4 Type II of ”Sub Max Planck Length Gravitational-Electromagnetic Confinements”

The “sub Max Planck’s length” Type II confinement has been described for the electric field intensity:

\[
\begin{pmatrix}
  e_r \\
  e_\theta \\
  e_\phi
\end{pmatrix}
= \begin{pmatrix}
  0 \\
  e^{G_1 e_0 \mu_0} \frac{h(\theta, \phi)}{8 \pi r} \sin[\omega t] \sin[r \sqrt{E_0 \mu_0 \omega}] \\
  - e^{G_1 e_0 \mu_0} \frac{h(\theta, \phi)}{8 \pi r} \sqrt{K1 - \sin[\omega t]}^4 \sin[r \sqrt{E_0 \mu_0 \omega}]^4
\end{pmatrix}
\]

(58)

The “sub Max Planck’s length” confinement has been described for the magnetic field intensity:

\[
\begin{pmatrix}
  m_r \\
  m_\theta \\
  m_\phi
\end{pmatrix}
= \begin{pmatrix}
  0 \\
  e^{G_1 e_0 \mu_0} \frac{\sqrt{E_0 \mu_0}}{8 \pi r} h(\theta, \phi) \sqrt{K1 - \sin[\omega t]}^4 \sin[r \sqrt{E_0 \mu_0 \omega}]^4 \\
  e^{G_1 e_0 \mu_0} \frac{\sqrt{E_0 \mu_0}}{8 \pi r} h(\theta, \phi) \sin[\omega t]^2 \sin[r \sqrt{E_0 \mu_0 \omega}]^2
\end{pmatrix}
\]

(59)
The divergence of the electric field intensity (electric charge density) equals:

\[
\nabla \cdot \begin{pmatrix}
  e_r \\
  e_\theta \\
  e_\phi
\end{pmatrix} = \frac{G_{\text{le}}}{8\pi r} \sqrt{K1 - \sin[t \omega]} \sin[r \sqrt{\varepsilon_0 \mu_0 \omega}]^4 h^{(0,1)}[\theta, \varphi] \tag{56}
\]

\[
+ \frac{G_{\text{le}}}{8\pi r} \sin[t \omega]^2 \sin[r \sqrt{\varepsilon_0 \mu_0 \omega}]^2 h^{(1,0)}[\theta, \varphi]
\]

In which K1 is an arbitrary constant with a Positive charge value.

The divergence of the magnetic field intensity (magnetic monopole) equals:

\[
\nabla \cdot \begin{pmatrix}
  m_r \\
  m_\theta \\
  m_\phi
\end{pmatrix} = \frac{G_{\text{le}} \varepsilon_0 \mu_0}{8\pi r} \sqrt{\varepsilon_0 \sin[t \omega]^2 \sin[r \sqrt{\varepsilon_0 \mu_0 \omega}]^2 h^{(0,1)}[\theta, \varphi]} \tag{57}
\]

\[
+ \frac{G_{\text{le}} \varepsilon_0 \mu_0}{8\pi r} \sqrt{\varepsilon_0 \sin[t \omega]^4 \sin[r \sqrt{\varepsilon_0 \mu_0 \omega}]^4 h^{(1,0)}[\theta, \varphi]}
\]
Figure 10  Equation (56):  Plot Graph of the Electric Field Intensity $f(r)$ for the region $10^{-85} < r < 10^{-80}$ with a frequency of $\omega = 10^90 \text{ [s}^{-1}]$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $1.6726 \times 10^{-27} \text{ [kg]}$ located at the center of the confinement, according Newton’s Shell Theorem.
Figure 11 Equation (56): PlotGraph of the Electric Field Intensity $f(r)$ for the region $10^{-85} < r < 10^{-84}$ with a frequency of $\omega = 10^90$ in which the gravitational field acceleration has been chosen accordingly an electromagnetic mass of $1.6726 \times 10^{-27}$ [kg] located at the center of the confinement, according Newton’s Shell Theorem.
14. Concluding Remarks

The example of Gravitational-Electromagnetic Interaction, presented in table 1 shows two types of confinement.

1. For values $0 < n < -1$, the Gravitational-Electromagnetic Confinement will be Gravitationally controlled (Table 1). This means that for values for $r > R_{\text{boundary}}$ the inward bounded Gravitational for will be larger than the outward bounded Electromagnetic Radiation pressure. Electromagnetic Radiation will be attracted by Gravity towards the confinement at the surface $R_{\text{boundary}}$. Because for values $r < R_{\text{boundary}}$ the outward bounded radiation pressure is higher than the inward bounded gravitational pressure, all the radiation will be forced to be confined at equilibrium just at the surface of the spherical sphere with radius $R_{\text{boundary}}$. The confinement can be considered as an Electromagnetic Black Hole.

2. For values $-1 < n < -\infty$, the Gravitational-Electromagnetic Confinement will be Electromagnetically controlled (Table 1). This means that for values for $r > R_{\text{boundary}}$ the inward bounded Gravitational for will be smaller than the outward bounded Electromagnetic Radiation pressure. Electromagnetic Radiation will be scattered by the Radiation Pressure away from the confinement at the surface $R_{\text{boundary}}$. Because for values $r < R_{\text{boundary}}$ the outward bounded radiation...
pressure is smaller than the inward bounded gravitational pressure, all the radiation will be confined within the sphere with radius $R_{\text{BOUNDARY}}$. The confinement can be considered as an Electromagnetic Particle.

3. For values $n = -1$, the inward bounded Gravitational pressure equals the outward bounded Electromagnetic Radiation pressure at any distance $r$. The calculated value for $R_{\text{BOUNDARY}}$ becomes $R_{\text{BOUNDARY}} \rightarrow \infty$.

Because of the extremely high-energy densities within electromagnetic-gravitational confinements and the extremely small dimensions, the radiation pressure at small densities will be extremely high. For this reason, single harmonic (monochromatic) electromagnetic-gravitational confinements will behave like nondeformable particles in experiments.

Table 1 demonstrates that the mass density division within the Electromagnetic Gravitational Confinement determines a wide range of diameters of the Confinements varying from $10^{-52}$ [m] (which is $10^{-42}$ times smaller than the diameter of the atom) until $10^{54}$ [m] (which is $10^{27}$ times larger than the diameter of the observable universe).

The exact solution for a Gravitational Electromagnetic Confinement results in diameters much smaller than Planck’s Length ($1.616229 \times 10^{-35}$ [m]).

The fundamental question is: How it is possible to create confinements from “visible light” (with a wave length
between $3.9 \times 10^{-7}$ [m] until $7 \times 10^{-7}$ [m]) within dimensions smaller than Planck’s Length?

This is only possible when the wave length of the confined radiation is smaller than the dimensions of the confinement. This requires extreme high frequencies. The transformation in frequency from visible light into the extreme high frequency of the confinement is possible because of the Lorentz transformation during the collapse of the radiation when the confinement has been formed (implosion of visible light).
15. Three fundamental Equations in Qantum Physics

Taking the 4-dimensional Divergence of the 4-dimensional Stress Energy Tensor\(^{(1,16,29)}\) \((\text{Equation 3})\) results in a 4-dimensional 4-vector with 4 components which can be presented as 3 fundamentally different Electromagnetic/Quantum Mechanical equations.

1) The 4\(^{\text{th}}\) component of this 4-vector equals Poynting’s Theorem. Evidence has been presented that the Schrödinger Wave Equation is nothing more than Poynting’s Theorem (equation 42, Ref.29) rewritten in a complex way (equation 55, Ref.29)

2) The 4\(^{\text{th}}\) component of this 4-vector equals Poynting’s Theorem. Evidence has been presented that the relativistic Dirac Equation is nothing more than Poynting’s Theorem (equation 57, Ref.29) rewritten in a complex way (equation 102, Ref.29)

3) The first 3 components of this 4-vector result in the extended Maxwell Equations (5) and (5-a)
16. The Carmen Cygni in Quantum Physics

Now the four Powerful Castles have fallen:

1). **The Castle of the Dice.** It follows from (36) that “Confined Single Harmonic Electromagnetic Waves” are far superior candidates for “De Broglie” waves because they carry the mass (electromagnetic mass) and probability waves do not carry mass at all.

After the first publications of the famous first photo of the hydrogen atom it became clear that what had been photographed could never be a photo of a non-existing complex probability wave with zero mass.

And it will be clear that due to Electromagnetic Interaction it is very well possible to photograph a confined monochromatic electromagnetic wave. Instead of the non-logical model of a zero mass probability wave describing the probability that the mass of an elementary particle is at a certain time at a certain place, it is only logical to define the mass division through the electromagnetic mass division of a “Confined Single Harmonic Electromagnetic Wave” according Equation (36).

For that reason it has been concluded that “De Broglie” waves are not complex probability waves but are “Confined Single Harmonic Electromagnetic Waves” written in a complex way. (equation 13, Ref.29) like the example of a confined single harmonic electromagnetic wave in Equation (13) in this manuscript.
2). **The Castle of Schrödinger.** The 4th component of this 4-vector equals Poynting’s Theorem. Evidence has been presented that the Schrödinger Wave Equation is nothing more than Poynting’s Theorem (equation 42, Ref.29) rewritten in a complex way (equation 55, Ref.29)

3). **The Castle of Dirac.** The 4th component of this 4-vector equals Poynting’s Theorem. Evidence has been presented that the relativistic Dirac Equation is nothing more than Poynting’s Theorem (equation 57, Ref. 29) rewritten in a complex way (equation 102, Ref.29)

4). **The Castle of Maxwell.** The first 3 components of this 4-vector result in the extended Maxwell Equations (5) and (5a). The 4 Maxwell Equations published in 1861 by James Maxwell are incomplete. The correct equation is Equation (5) in this manuscript or (Equation 3, Ref 30)

Now the four castles have fallen there is only one possible final conclusion: Indeed, **God does not play Dice.** Probability does not exist. And the Power of the Dice has been broken by the Power of the Light.

Without probability, elementary particles cannot exist. Because they belong together like the Dice and the Gambler. And without Probability and Elementary Particles, without the Dice and the Gambler, what has been left of Quantum Physics? The song of the Dying Swan?

**Light** (Confined Single Harmonic Electromagnetic Radiation) is the building element of our universe. As Jesus
has spoken: “I am the Light of the World (John 8:12). He spoke for the world.

Now the world is free to leave the gambling house and to stop playing dice with the devil. Instead of spending trillions of dollars to investigate non-existing elementary particles in extremely expensive high energy accelerators, the world has the possibility to spent trillions of dollars to create, to build and to improve “drinking water systems”, that change ocean water into drinking water, to turn the deserts into oases of green, into oases of fruit trees and vegetables. Instead of killing warzones, the whole Mideast, Africa and so many third world countries could turn into an oasis of prosperity where everybody has enough to eat and these countries will have the possibilities to export fruits and vegetables. Turn whole the Mideast and Africa into an Oasis of green instead of letting the thousands of refugees being drowned in the Mediterranean Waters. We have the powers and you we can do it. It is all a matter of choice. Do we chose for Light or do we chose for Darkness.

Because that is the Darkness of the Dice. To make us believe that it does not matter. That we can look away from all the injustice that happens around us because the Dice will decide the outcome anyways. To make us believe that it does not matter what we do or do not. That the fact if a totally destructive Third World War will come or not is not up to us but it is the outcome of a Dice which is completely beyond our control. Like the death of Schrödinger’s cat is determined by the outcome of the Dice.
How different is the world of the Light. The world without the Dice. A world in which we have the totally responsibility and the freedom to choose. And our choices will have consequences. We can create Heaven on Earth or Hell. It is just a matter of choice.

The world is in danger. A cloud of intense darkness is approaching our world. Claws of hate are reaching out for us. Claws of darkness ready to rip open our hearts and let our souls bleed to death. Killing the Love and planting the Hate deep in our wounded bleeding hearts.

And the world is deep asleep and the dormitories are on fire and the smoke of hate is already filling our lungs. Because who can see in the darkness? Who can cross the boundaries between our world and the spiritual world? Who can enter the dreams and go beyond the dream?

It is possible for everyone. We are children from the spiritual world and when we pass away, we will enter that world again. And we will recognize that world so well like it has always be our home and we never went away.

The Spiritual world is on fire. And the ware is going on. The war between hate and love. We have been sent to the world, not to enjoy the world. Not to live in peace. We have been send to a war zone. A world in fire. And the darkness in on the winning side.

We are soldiers send to the world to save the world. But what have we done? We have become drunken soldiers who
have forgotten their mission and have fallen asleep while the world is on fire and the darkness is already so nearby.

We have been sent to the world to save the world. And we have forgotten our mission and the world is in danger. Because only we can save the world. Only we have the power to create Heaven on earth. But then we have to come together. And instead of being drunken soldiers, we have to gather again and form our groups together. With one simple mission. Save the world.

That is only possible when science and religion come together. And that is only possible when science drops the claim of ”Probability”. Because it is not true. God is not a “Dice”. Life has a meaning. Life has a goal. The world has a destiny. Nothing has been in vain. Every pain, every tear that has been shed, every suffering, every crying without any hope has its goal, has its meaning and they all are part of the war. The war between Hate and Love. The war in the Spiritual World and the war in this World. It is the same war. And there is so much to lose and there is so much to win.

Religion has to drop the claim that they know God. We can never put God into a quantum mechanical box. God is far beyond the worlds we will ever know and understand. The “God’s particle” is nothing more than only Blasphemy. Pretending to know God is Blasphemy. Telling people they are sinners and not from God is Blasphemy. Judging people because they think differently, they feel differently, they speak differently, they look differently, they have a different sexuality, they are not obedient and do not fit
within the system is Blasphemy. Because God is freedom and the meaning of “YHWH” is: “I am who I am”.

Because nobody knows God. Nobody is allowed to speak in the name of God. Nobody is allowed to judge in the name of God. Nobody is allowed to punish in the name of God. We all are children in his world and we all are equal. And the power is given to us to create a Hell on earth or a Heaven on earth. The power is given to us to hate each other or to love each other. The choice is ours.

Now the world will have the possibilities to spend trillions of dollars to find in even more expensive Higher Energy Accelerators that tiny missing elementary particle to find out the Origin of Matter, the Origin of our Universe, to understand finally why we are here and to measure God. Or to spend trillions of dollars to build dikes to protect the people in the dangerous lowland that will come underwater when the ocean levels are rising and to build Oases of Green that will feed the hungry people.

To understand that Science is given to mankind to serve mankind, to protect the people and to make their lives better. That Science is a gift from an unseen and an unknown world. And that Science is not something that we own, that we can control and that we are allowed to abuse. But that science is the gift from Heaven to save the world. And that we will finally understand that we did not come to Earth to control each other and to manipulate each other but that we have come to Earth to learn to love each other.
To understand that Religion is given to mankind to remember that we are warriors in an evil war and prepare us to fight on the battlefields. The battlefields where the shadows of the darkness will surround us and the smoke of Hate will penetrate deep our lungs and our soul is bleeding and the screaming of the world will fill our hearts with pain. The battlefields where fear will be our worst enemy and our only friend. The battlefields of the war between Hate and Love.

To understand that Religion is given to mankind to let us see the darkness and the faces of Hell. To teach us how we can fight against our own fear and our own weakness with the invincible power of love. To teach us how love will set us free. To teach us how love will set the world free.

Because in the whole universe there is no power stronger than the power of love. Because only love can heal the wounds of the world. Only love has the power to destroy the Hate. Because in the Spiritual world the Love becomes visible as the brightest and the most Beautiful Light you have ever seen. There is no Shadow of Darkness that has power over the Light. There is no Hate that has power over the Love. It is only Love that will save the world.
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