

# The Charged geometry of EM mass-ENERGY-Matter

## Addressing and answering the foundational mysteries of Physics

*"...the scientist makes use of a whole arsenal of concepts which he imbibed practically with his mother's milk; and seldom if ever is he aware of the eternally problematic character of his concepts. He uses this conceptual material, or, speaking more exactly, these conceptual tools of thought, as something obviously, immutably given; something having an objective value of truth which is hardly even, and in any case not seriously, to be doubted. ...in the interests of science it is necessary over and over again to engage in the critique of these fundamental concepts, in order that we may not unconsciously be ruled by them."* [Albert Einstein]

Given the range and applied scope of Quantum Physics in today's Technologic World there remains a driving desire to rationalise our numerous disparate scientific theories into one coherent discipline that can be applied equally to the Quantum and Cosmological scales of our Universe.

Such a theory would need to preserve the currently observed outcomes and present established theories in a new light, offering additional testable predictions of its own, and ideally do so in a manner that is simpler than that of the established quantum theories and hypotheses.

Many foundational properties of Quantum Mechanics remain unaddressed by scientific theory and in the following pages an overview of the key quantum properties challenging our current scientific advancement will be highlighted, including a number of assumptions that currently impede the development of a fully realised, coherent solution to all of our current scientific questions.

While Mathematics is the language of Science it remains a language that lacks a well-defined physical model on which to test it and further its many and varied solutions to Quantum Mechanics. It is this lack of any rigid, enforceable GEOMETRY that has allowed the flourishing of numerous statistical and probabilistic solutions to physical problems in turn impeding our scientific advancement of quantum processes.

The Standard Model has many observed and testable components to it but more recently new theories have emerged to contest it without being rigorously testable themselves. They rely on the established foundation provided by the Standard Model but try to explain its various deficiencies ad-hoc without any solid footing of their own.

The only way to progress further in our scientific endeavours is to retrace our footsteps in Quantum Mechanics and develop new physical models on which we can discern our known results and observations thus excluding any false mathematical assumptions.

In doing so there exists the promise that a simple underlying geometric foundation can be found, revealing new and exciting advances in Science that will allow us to usher in a new age of scientific and technological advancement for the betterment of humanity as a whole.

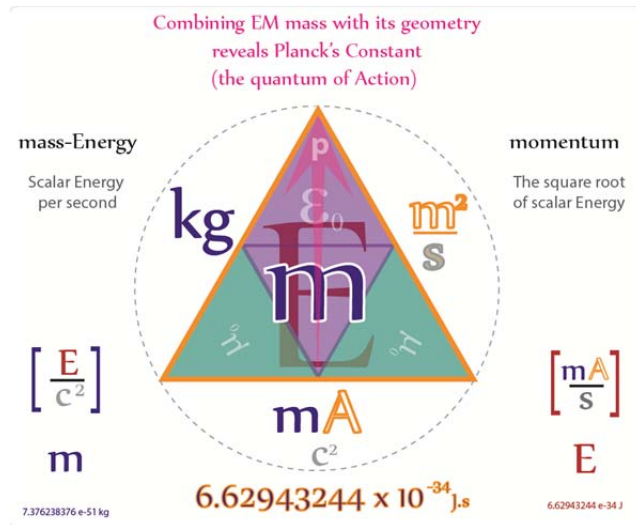
'Tetryonics – The Charged geometry of EM mass-ENERGY-Matter' whose founding principle is that **EQUILATERAL energy** is the foundation geometry for all quantum mechanical processes is presented here as just such a solution to the current quandaries of Quantum Mechanics.

## ENERGY

Energy, in Physics, is an indirectly observed quantity of a system that imbues it with the ability to exert a Force or do Work.

It has been measured and quantified through numerous methodologies over the centuries, most notably through its associated characteristics such as mass, velocity and ElectroMagnetic fields.

The most recent attempt to quantify its characteristics (with respect to heat and light) led to the discovery of Planck's constant and the development of Quantum Mechanics



The application of a simple premise (that

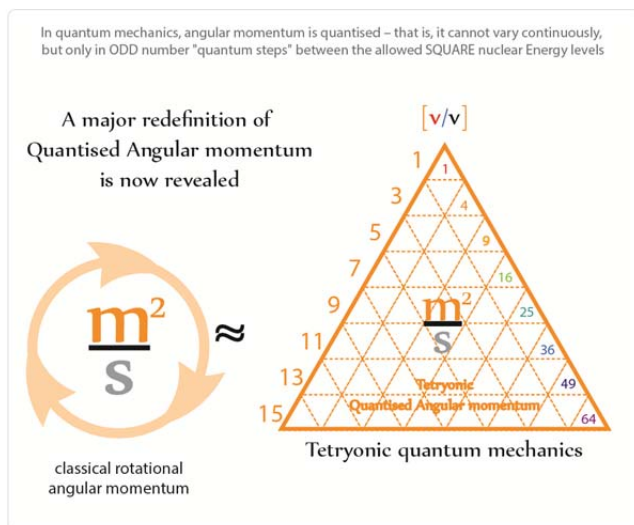
Energy has an equilateral geometry) opens the door on a greater understanding of the mechanics of the quantum world, a realm that will be forever beyond the reach of our physical eyes.

The myriad of perplexing properties of quantum particles (such as Charge, mass, Matter) and the astonishing outcomes of quantum experiments (Interference and Wave-Particle duality) can now all be readily modelled and explained rationally on a solid geometric footing.

Paving the way for new discoveries and a greater understanding of our Universe and its mechanics

## Quantised Angular Momentum

Building on the priori definition of equilateral energy quantisation it can be quickly demonstrated that any energy measurement per unit of Time results in a geometric unit of measurement that has historically be taken to represent rotational motion (specifically Angular momentum)



**This unit of motion is found throughout Quantum Mechanics and is directly related to the square energy levels in nuclear processes.**

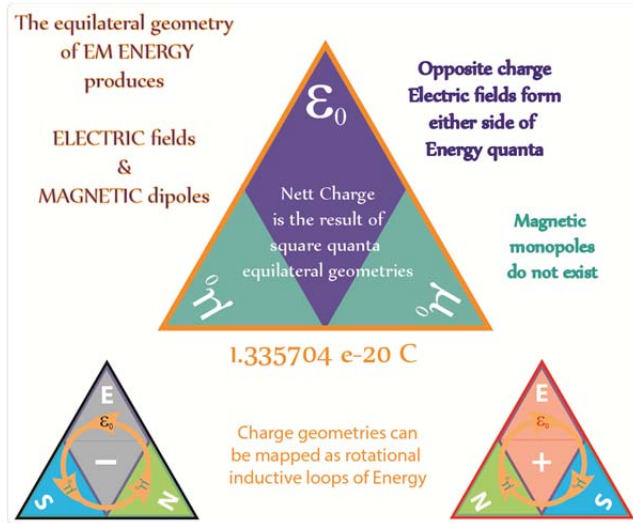
The equilateral EM fields of energy quanta are constrained by its geometry and this geometry lies at the heart of understanding the quantum world in all its beauty.

It determines properties such as Electric permittivity and Magnetic permeability, the vector direction of linear

momentum and relates the scalar property of electromagnetic mass quanta directly to velocity.

# CHARGE

A fundamental property of all mass-ENERGY-Matter that gives rise to the Forces of electrical Interaction has eluded physical explanation by Physicists since its discovery and led to many 'band aid' additions to the Standard model in attempts to explain its observed properties.



The most recent attempt at explanation was Special relativity which in turn led to the development of Quantum Mechanics itself.

SR explains Charge as an invariant property of electrostatic bodies and that the motion of charges creates an additional magnetic moment through the relativistic distortion of spherical bodies.

Equilateral energy geometries offer a completely different explanation for the

source of electrostatic charges and their associated magnetic moments.

Positive and Negative Charges are opposite side of the same quantum energy 'coin', and can be modelled electrically as ideal quantum inductive loops. It is equilateral geometry that gives rise to the physical properties of inertial mass, the elemental charges and even the geometry of Matter itself.

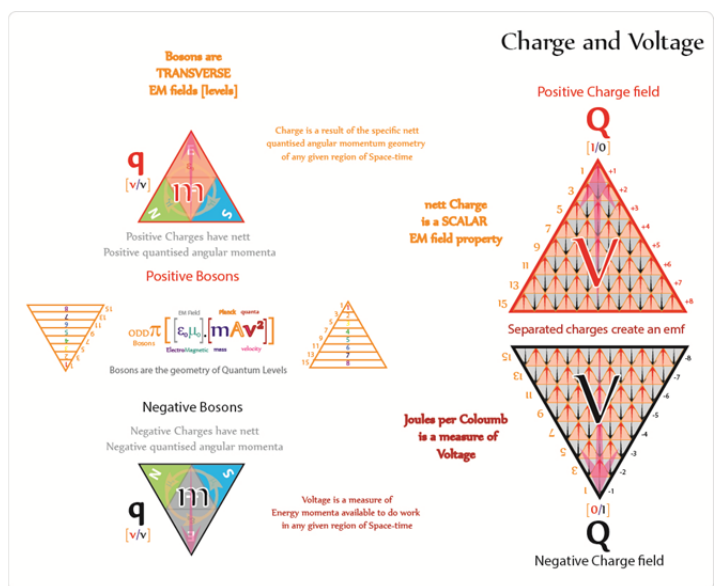
In a planar 2D form they form a neutral EM energy geometry but it is when they form the fascia of 3D Matter they are expressed as either Positive or Negative electric charge fascia.

ODD number energy quanta [W Bosons] combine via their magnetic bases in fixed quantum steps to create the 'square' nuclear energy levels so familiar to quantum mechanics and form the basis for ElectroMagnetic Induction.

It is their rigid equilateral geometry that provides the basis for relativistic charge invariance and the quantum mechanism for photo-electron transitions in atoms while the net energy momenta quanta in charged geometries provides the electromotive force known as Voltage.

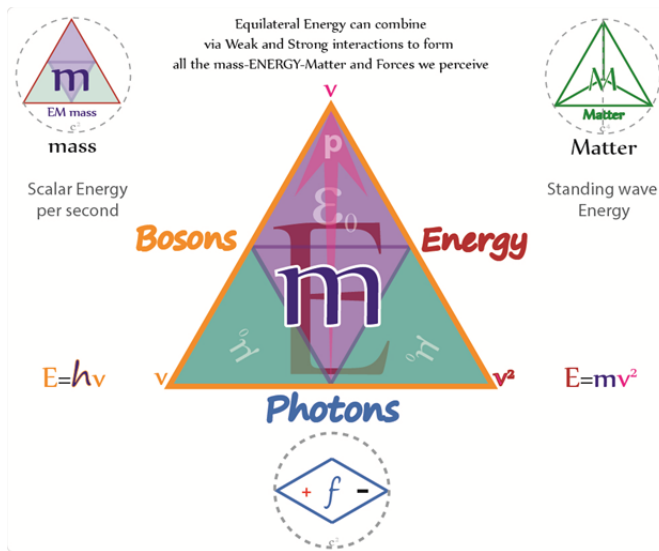
Equilateral geometry reveals an intrinsic connection between EM Energy and Charge.

As separated charges seek equilibrium they provide motive forces & the quantum scaffolding for large scale Matter and interactions throughout the Universe.



## mass-ENERGY-Matter

All Energy has an EM mass equivalence and equally any object with EM mass has Energy equivalence



But there has never been a formal scientific definition and associated equation to distinguish the property of EM mass from that of Matter.

Using Tetryonic geometry it can be clearly demonstrated that ElectroMagnetic mass is NOT Matter – it is the Energy content of a system per unit of time  $[E / c^2]$  in total agreement with Einstein (and all before him) however lacking a formal definition of either the two terms have become mired with each other so much that they are often used for each other inappropriately even in scientific literature.

**ElectroMagnetic mass is the two dimensional (planar) measurement of Energy per unit of Time whereas Matter is a measure of the tetrahedral energies found in a spherical volume of 3D space.**

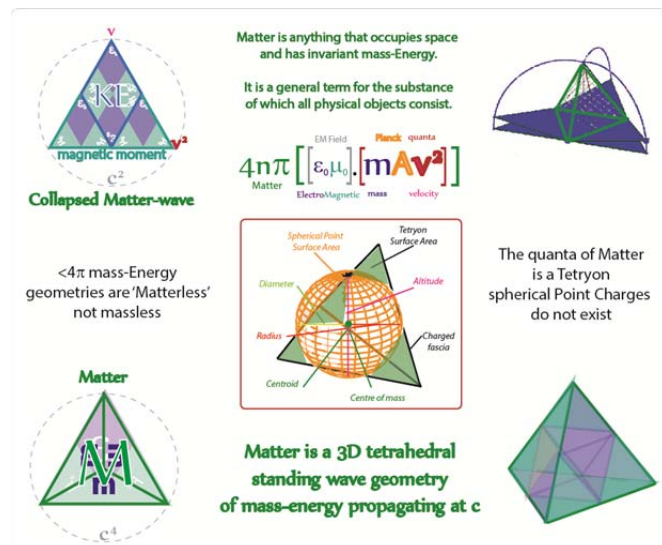
Mass-Energy can be viewed as the paper from which 3D Matter is created when it is folded into a tetrahedral shape (the Quantum canvas covering the geometry of Matter)

The often used tem of ‘massless’ is now shown to be a misnomer that should be removed from the scientific vocabulary except where it specifically refers to empty space (devoid of any energies).

Matter is now formally defined geometrically as  $4n\pi$  tetrahedral standing waves of EM energy and it is their tetrahedral geometry of Tetryons that forms the foundation for all large scale Matter in the Universe (not spherical geometries).

Charge allows EM masses to form a Tetryonic geometry giving volume to Matter and Energy momenta provides the interactive forces between them imbuing motion to our Universe.

Matter at rest is comprised of EM energies that are always in motion propagating in a tetrahedral EM standing wave geometry.



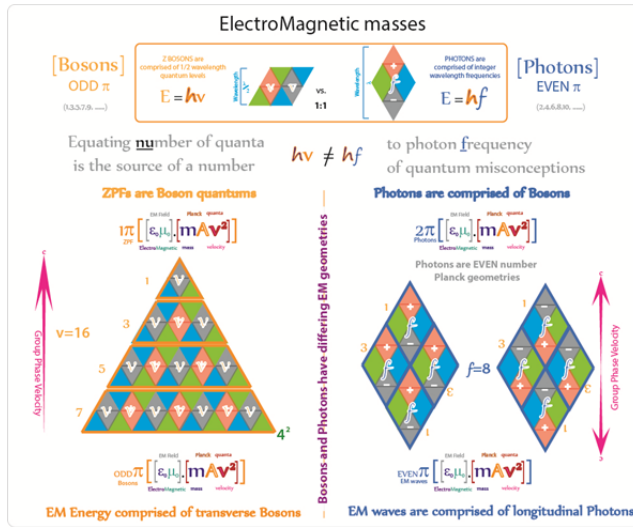
*Rest mass* can now be defined as the EM mass-Energies comprising stationary Matter geometries, better reflecting their distinct physical properties.

*To cause at will the birth and death of matter would be man's grandest deed, which would give him the mastery of physical creation, make him fulfil his ultimate destiny."*

[Nikola Tesla]

# Quantum Particles

Using equilateral energy all the geometries of quantum EM mass-Matter particles can be physically modelled revealing the known Standard Model particles.



Bosons are shown to be transverse EM fields that facilitate EM induction and Photons are revealed as longitudinal dual-charge pairs possessing a neutral EM charge and inherent magnetic moment.

The net unidirectional momentum of Bosons then distinguishes them from Photons that possess a bi-directional momentum

Closer examination of the geometries highlights a long-standing error in the mathematical formulation of QM energy formulas, namely the mistaken interchanging of Planck's quanta [v] for Einstein's frequency [f] in relation to Energy.

## 2D EM masses [Bosons-Photons] do not possess the physical property of 3D Matter [Fermions]

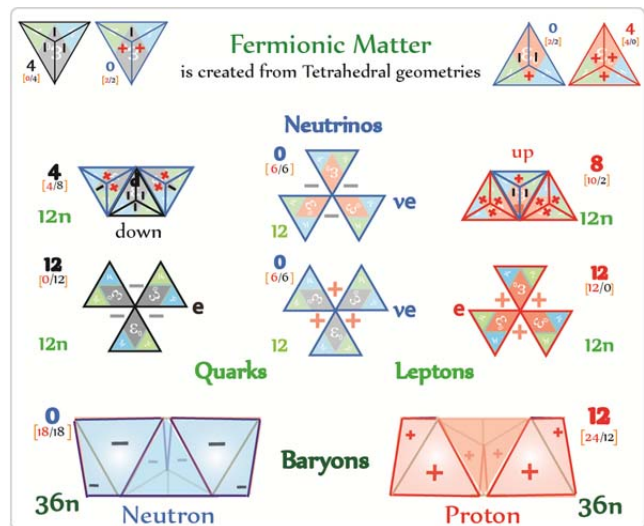
Fermions can now be defined as the standing wave energy geometries that create all the known sub-atomic particles – the building blocks of large scale Matter and structure in the macro world.

Historically these particles have been classified according to their charges and masses, Tetryonic geometry now provides a 3D physical model of all the particles highlighting the physical source of the 1/3 charges of Quarks revealing charge to be the foundational geometry of all Matter.

Tetryons are  $4\pi$  charge geometries that are the foundational quanta of Matter and surprisingly have a mass-charge ratio identical to that of Leptons explaining how these particles have remained hidden from accelerator experiments.

Quarks are  $12\pi$  charge Matter geometries where the attractive strong charge interactions between their fascia results in entirely different properties to that of Leptons

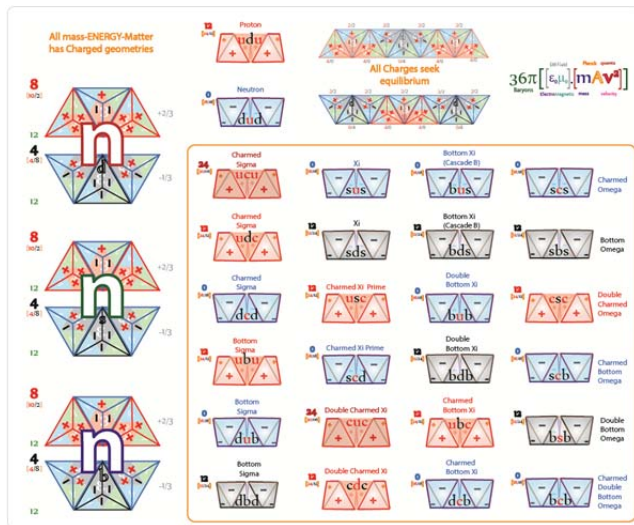
Leptons also have  $12\pi$  charge but with repulsive fascia geometries that result in them forming the quantum equivalent of a 6 loop rotator



Protons and Neutrons are  $36\pi$  charge geometries and have identical masses [against the current model of baryonic masses derived from an entirely different process where Neutrons are formed by Protons absorbing electrons].

Leptons and Baryons then seek to combine into neutral charge elements that are the quantum electrical equivalent of synchronous rotating convertors enabling them to absorb, store and release quantum energies in the familiar forms of Photons and EM mass.

# The Particle Zoo



Baryons – the building blocks of atomic nuclei can be formed from many tri- quark combinations and energy levels and this is of particular note when modern accelerators are used to probe atomic structures.

The higher energies they employ when colliding particles together results in higher 2D kinetic energies (and increased energy quanta) which recombine after collisions into a plethora of similar particles called the Particle Zoo.

A sound understanding of EM mass-Energy & the charged geometries of all Matter reveals the true genesis of all of the Baryons in the particle zoo.

Tetryonic geometries will facilitate the precise 3D modelling of all the periodic elements, allotropes and compounds enabling the development of new classes of materials and medicines providing us with many new insights into Quantum Chemistry and large scale Matter in general.

## Quantum ElectroDynamics [QED]

Adding to the mysteries of quantum mechanics is a number of well-known QED effects that have also eluded physical explanation – to date

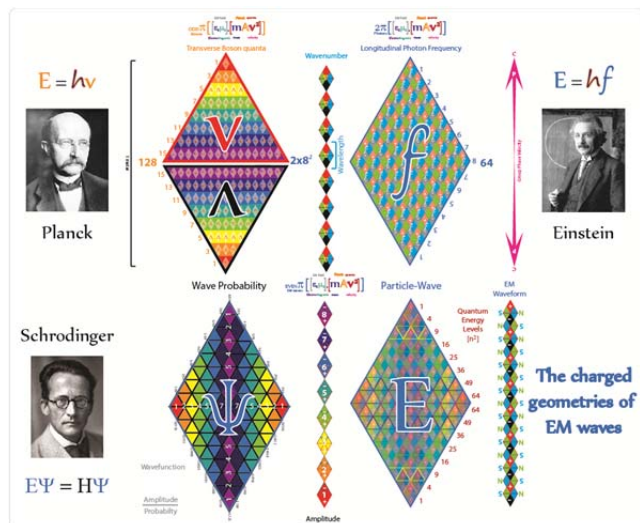
In 1865, James Maxwell Clerk unified the then disparate theories of Electric and Magnetic fields into a theory of Electromagnetism and related then to the velocity of light.

The exact quantum geometry for EM wave geometries (and the Photons comprising them) that explains their Wavefunctions and observed inference patterns represents one of the greatest challenges to developing a concise fully realised quantum theory of EM radiation.

Wave-Particle duality dating back to the 17<sup>th</sup> century is perhaps the best known example of quantum behaviour that has defied precise modelling despite intense effort by scientists around the World for over two centuries

The application of equilateral energy to the charged geometries of Photons and EM waves not only explains these long standing mysteries but also removes the quantum fuzziness introduced by Heisenberg’s Uncertainty principle.

Clearing the way for Science to develop an advanced understanding of Electricity, its role in Quantum ElectroDynamics and provide new clean forms of energy from quantum processes.



## Photo-electrons and spectral lines

The physical relationship between Spectral lines, Rydberg's Constant and the Kinetic energies of

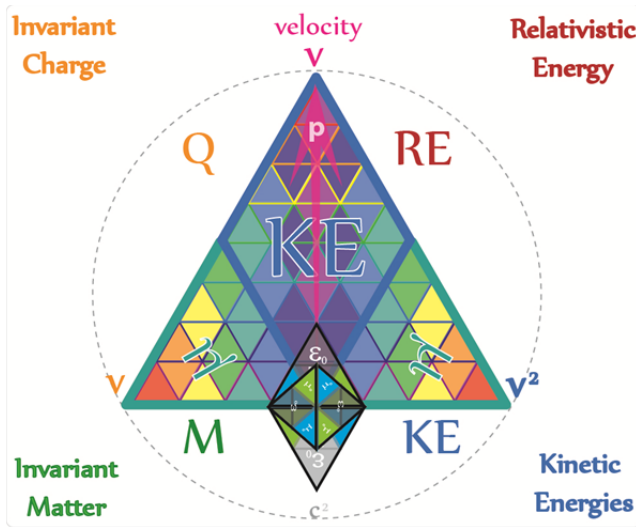


Photo-electrons as they interact with photons and atomic nuclei is quickly revealed when equilateral energy geometries are employed

It is the rigid geometry of equilateral Energy momenta that gives rise to the invisible forces of Faraday's Electric and Magnetic fields and Newton's Action-at-a-Distance.

Quantised Angular Momentum, a direct measure of the long hidden equilateral geometry of Energy, is revealed as the

source of Charge, the physical constants and even the geometry of EM mass-Energy & Matter itself.

## The geometry of Nuclear Forces and Constants

Charge interactions resulting from equilateral EM energy geometries have been mistakenly developed into three disparate nuclear forces:

**The EM Force** is the result of  $2n\pi$  charge geometries acting along transverse or longitudinal directions (or in superposition) in the forms of Bosons and Photons

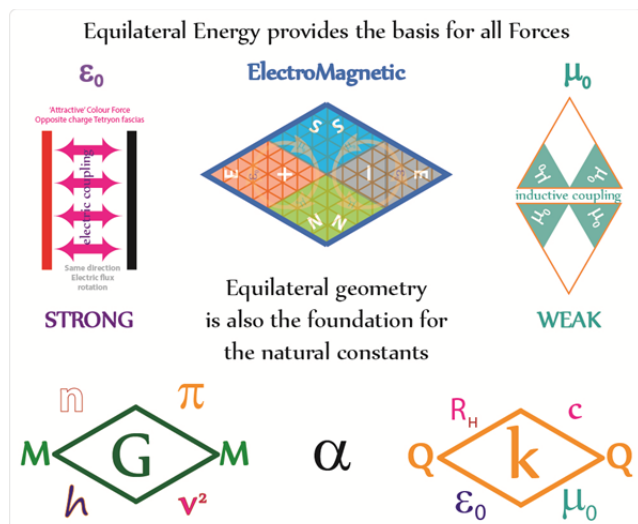
**The Weak Force** is the inductive coupling of the magnetic permeability of adjacent energy geometries

**The Strong Force** is the attractive force between opposite charged fascia of Tetryonic Matter. It can also form a repulsive force between similar charged fasciae resulting in charged Leptons [electrons].

**Gravitation** (mathematically identical to Coulomb's Force save for strength and source) can also be modelled as the geometric mean of super-positioned EM waves.

All of which are determined by the Fine Structure Constant – the mysterious hand of GOD – setting the strength of EM interactions and determining Charge on the quantum level.

Applying equilateral geometry to energy momenta quanta the Tetryonic model of EM mass-ENERGY-Matter quickly evolves to explain many additional electrical properties such as Voltage, Current and Power

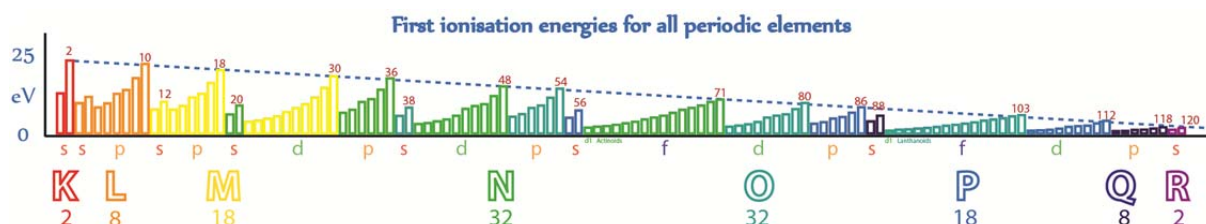


## Quantum Chemistry

Applying equilateral energy geometries to quantum chemistry leads to a number of significant advances in the understanding of chemical processes most notably:

- **Accurate models for all periodic elements and their associated allotropes**
- **Advanced molecular orbitals plots**
- **Exact rest masses for all elements and**
- **A new Periodic table based on the charged geometries of Matter**

Improving the Aufbau principle with charged geometries leads to many refinements in chemical engineering and facilitates the building of accurate 3D models of all elements, isotopes and compounds.

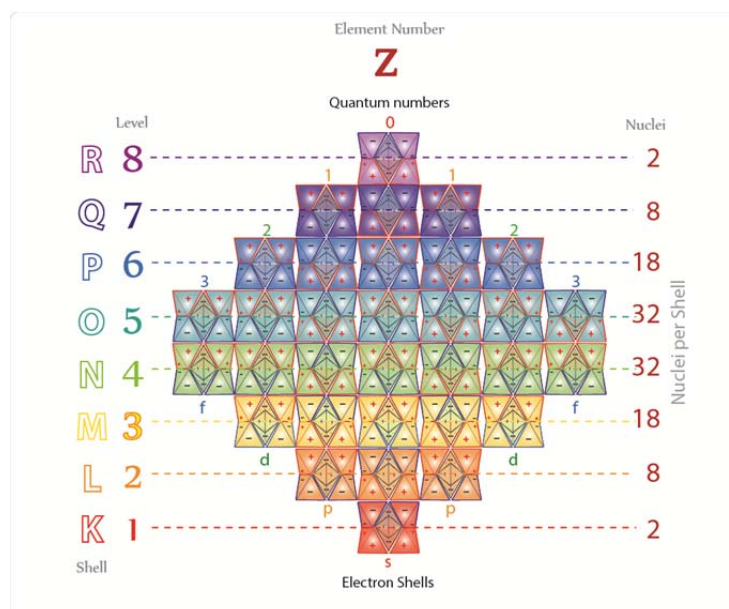


Every element can be analysed from the quantum level upwards revealing its exact 3D geometry, quark configuration, rest Matter-energies and chemical properties.

And number of misconceptions can be quickly clarified and corrected in turn advancing our understanding to the physical mechanics underlying chemical processes like chemical bonding, element family properties and the structures of complex chemical compounds.

Hydrocarbons and Carbohydrates have already been modelled using equilateral charge geometries with the results matching a number of established chemical models of Nobel gases, Core electrons, Lewis diagrams and compound symmetries.

Even DNA can be modelled in 3 dimensions leading to a greater understanding of the role of quantum mechanics in biological processes and the interaction of EM radiation on organic compounds.

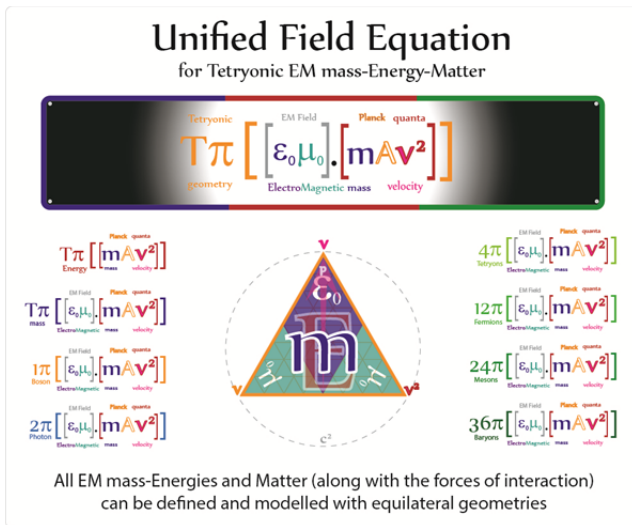


A highly developed quantum model of chemical elements and compounds will allow us to model chemical and biological structures in hitherto unimagined detail and facilitate the building of complex (and increasingly accurate) models of all chemical compounds and biological processes.



## A Unified field equation

In physics a Unified Field Theory is a type of theory that allows all that is usually thought of as a fundamental force or elementary particle to be formulated in terms of a single equation that explains all their disparate properties.



It is considered the holy grail of Science, offering the promise of advances in Technology, Energy and Medicine unparalleled in Human history.

Equilateral energy provides the foundation for the creation of a single equation that expresses EM mass-ENERGY and Matter as the result of geometric charge interactions.

Applying equilateral geometry to Energy quanta has been shown to firmly resolve many of the

current mysteries plaguing the Standard model and provides a firm foundation for the development of a single unified quantum theory uniting all quantum and macroscopic forces and structures.

In addition to revolutionising our understanding of Quantum geometries and interactions Tetryonic theory facilitates the development of a whole new field of Physical maths based on equilateral triangles in lieu of the spherical geometries historically employed.

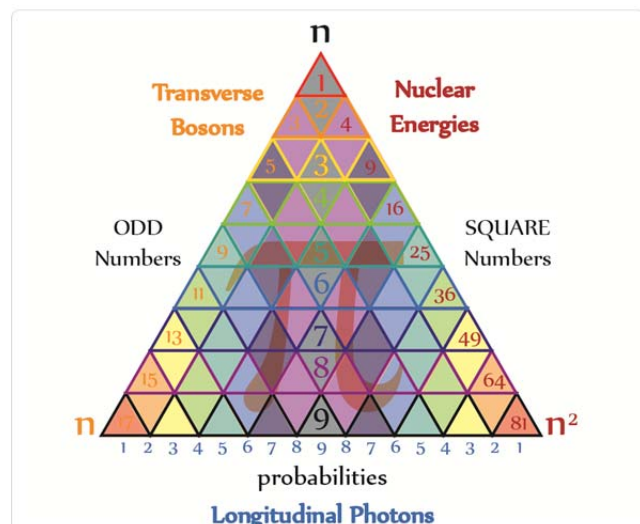
It effortlessly merges all the tested features of Classical mechanics with the statistical probabilities of quantum mechanics and scales up to the cosmological scales of General Relativity.

To date Tetryonic has advanced much further than these few short pages will allow but it is clear that the rigid modelling and answers afforded to Science by this approach opens the door to many new discoveries and opportunities for all of Humanity, including wonders like clean, limitless Energy and unlimited resources.

Equilateral charged energy geometries provide a quantifiable foundation for advances in:

- **Quantum Mechanics**
- **Quantum Electrodynamics**
- **Quantum Chemistry**
- **Quantum Cosmology**

explaining the quantum mysteries of mass & Matter, Wave-Particle duality and Electro-dynamics by challenging the very foundational assumptions of Relativity and the role of charge in our Universe.



To conclude, having now revealed the geometric key to realising one of the greatest advances in scientific understanding ever witnessed we must now endeavour to redress our current scientific, technological and social challenges with an equally rigorous determination so we ensure all of Humanity benefits from this discovery... *Tetryonics is my gift to our Planet and all future generations.*

- What assumptions are ripe for rethinking? Looking back over the history of physics we can identify a number of places where thinkers were "stuck" and had to let go of some cherished assumptions to make progress. Often this was forced by experiment, an internal inconsistency in accepted physics, or simply a

particular philosophical intuition. What are the tacit or explicit assumptions we are making now that are ripe for re-thinking?

- Possible topics or sub-questions include, but are not limited to:
  - What exactly are the basic physical and mathematical postulates in our "fundamental" physical theories or candidate theories?
    - Which of these could be replaced with a weaker or less restrictive postulate or even removed?
    - What about replacing them with more restrictive postulates?
    - What would be the potential benefits (or disadvantages) of these changes?
  - What are the implicit assumptions we tend to forget we have postulated, or that have become so ingrained that they have become unquestioned dogma?
  - What are the most interesting current "anomalous" experiments, and what assumptions would we be forced to give up if we took them seriously?
  - Which assumptions in physics and in cosmology are interdependent or required for self-consistency, and which could be modified?
  - Where are there "paradoxes", or apparent contradictions stemming from the combination of seemingly reasonable assumptions? How do we reconcile these?
  - Are there "meta"-assumptions or criteria (e.g. "simplicity", or "beauty", or "utility") that can or should underlie some current "fundamental" assumptions?

(Note: Successful and interesting essays will not use this topic as an opportunity to trot out their pet theories simply because those theories reject assumptions of some other or established theory. Rather, the challenge here is to create new and insightful questions or analysis about basic, often tacit, assumptions that can be questioned but often are not.)

Additionally, to be consonant with FOXI's scope and goals, most essays should be primarily concerned with physics (mainly quantum physics, high energy "fundamental" physics, and gravity), cosmology (mainly of the early universe). However, essays in closely related fields (such as astrophysics, astrobiology, biophysics, mathematics, complexity and emergence, and philosophy of physics) are also of interest insofar as they bear directly on the essay topic and can be enjoyed/evaluated by readers with principle expertise in physics and cosmology.

- *Foundational*: This Contest is limited to works addressing, in one of its many facets, our understanding of the deep or "ultimate" nature of reality.
- **Interesting**: An interesting essay is:
  - *Original and Creative*: Foremost, the intellectual content of the essay must push forward understanding of the topic in a fresh way or with new perspective. While the essay may or may not constitute original research, if the core ideas are largely contained in published works, those works should be the author's. At the same time, the entry should differ substantially from any previously published piece by the author.
  - *Technically correct and rigorously argued*, to the degree of a published work or grant proposal.
  - *Well and clearly written*, so that it is comprehensible and enjoyable to read.
  - *Accessible* to a diverse, well-educated but non-specialist audience, aiming in the range between the level of Scientific American and a review article in Science or Nature.

### III. CONTEST RULES & PROCEDURES

Applications will be accepted electronically through the [form](#) on FOXI's website, as follows:

- **ENTRY**

- *Submission:* Essays and accompanying material must be submitted online using the [webform](#) between the dates of **May 24, 2012 and August 31, 2012** (until 11:59PM Eastern Time). Applicants must provide accurate contact information, an abstract of their essay, a brief biographical statement, and their essay. Immediately after an essay application is submitted, the applicant will receive an application confirmation email containing this information at their specified email address. This confirmation does not mean your essay has been accepted into the Contest. All essays will be reviewed for rule compliance (see "Publication" below) and those that are eligible will be posted online within one week.
- Please note: You will be required to register an email address with [fqxi.org](#) and set up an account to enter the Contest. This information is available on the application page.
- *Acceptability:* In order to be judged, essays must at least satisfy minimal professional standards of acceptability for publication, both qualitative and quantitative.
- *Format & length:* Essays must be submitted as PDF documents. Eligible essays must comply with these guidelines:
  - **The body of the essay may not exceed 9 pages and 25,000 characters** (not including spaces). To ensure your submission fits the character count, you can use our online character [counter](#).
  - This 9 page limit includes all figures and equations, calculated based on a standard 8.5 x 11 inch single-sided page with 1 inch margins. The following can be appended to these 9 pages: one page of references, and up to two pages of technical endnotes. No essay text (such as textual footnotes), figures, notations, or equations can be included in the reference section. The technical endnotes are meant to provide an opportunity for additional technical detail while retaining a readable, accessible, and self-contained essay body; all essay reviewers, including the Expert Judges, will be encouraged to focus on the body of the essay, and use the endnotes only as a technical supplement to a self-contained work.
  - Color figures as well as hyperlinks within the document are acceptable.
  - Although FOXi will accept essays from anyone anywhere, the essay must be submitted in English.
- *Publication:* After submission and review for rule compliance, each essay will be posted (within one week) in the FOXi Community Forum, under the category "Questioning the Foundations", along with each author name and bio. Thereafter, the author and interested readers (including FOXi Members, other Contest entrants, and the general public) are invited to discuss and comment on the essay. (Although commenters will be rating the essays, the goal of the forum is to discuss the essays and the ideas they raise; thus commenters are strongly encouraged to cultivate a supportive atmosphere of scientific conversation rather than a judgmental atmosphere of critical scoring and evaluation.)

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- **JUDGING**

- *Community evaluation:* Every FOXi Member and approved Contest entrant will be provided with a code allowing them to rate essays as a "Community evaluator", on a scale of 1-10 (10 being extremely relevant and interesting). A rating code will be provided to each entrant in the confirmation email. If an essay is considered ineligible in the Contest, the rating code will not be active. Community ratings can be submitted until 11:59PM Eastern Time, October 5, 2012.
- *Finalists:* A set of thirty-five finalists (the "Finalists") will be determined once voting closes, based on the essays with the top Community ratings that have each received at least ten ratings.
- *Expert Judges:* A panel of the applicants' peers, chosen by FOXi, will be asked to carefully review, deliberate upon, and rate the Finalists, based on the criteria

specified under "Evaluation Criteria".

This expert panel of judges will be confidential; their names will not be released, though they are free to post online comments just as any Community or Public evaluator.

- *Final Ranking:* The final ranking that determines the prize Winners will be determined by a combination of the Community ratings and ratings from expert judges, where each rating from an expert judge is given three times the weight of each rating from a Community evaluator, and combined ratings are rounded to one decimal (i.e., 1.0-10.0).
- *Special Commendation:* The Judges will also have the option, if they elect to do so, to award up to two prizes to the top essays from "non-professional and/or non-academic" entrants, based on the judging criteria set forth herein.
- *Public evaluation:* Members of the public will also be allowed to rate essays. Ratings from the public will be accepted until Winners are announced.
  - Public evaluators will have to submit their email address in order to rate essays. As with the Community evaluator, each Public evaluator can enter one score, 1-10, per essay.
  - Prizes will not be awarded directly on the basis of Public ratings, but these ratings may influence either Community evaluations or Expert judging.
- All decisions of the judges are final and the selection of Winners is at the sole and absolute discretion of FQXi.
- In the event of a tie, the expert judges will re-evaluate the tied essays and determine a Winner based upon the Evaluation Criteria.
- **PRIZES**
  - In addition to the cash prizes listed below, all First, Second, and Third Prize Winners will be invited to FQXi Membership, if the applicant is not already a Member, and Scientific American agrees to consider for publication adapted material from winning essays.
    - *First Prize (top ranked essay):* US\$10,000
    - *Second Prize (ranks 2-3):* US\$5000 each
    - *Third Prize (ranks 4-8):* US\$2000 each
    - *Fourth Prize (ranks 9-18):* US\$1000 each
    - *Judging Panel Discretionary Prize (at its discretion, the panel can decide to award up to 2 special commendation prizes for non-professional and/or non-academic entrants):*US\$1000

## IV. TECHNICALITIES & LEGALITIES

**No purchase necessary to enter or win. A purchase does not increase your chance of winning.**

- **ELIGIBILITY**
  - The Contest is open to everybody except employees and consultants (including Contest judges) of the Sponsors (the Gruber Foundation, Submeta, and the Foundational Questions Institute), Scientific American, and each of their respective parents, subsidiaries, affiliates, advertising and promotion agencies (collectively, the "Contest Entities") and their family/household members (defined as parents, spouse, children, siblings, grandparents).
- **GUIDELINES**
  - No person is allowed to submit more than one essay to the Contest, regardless if he or she is entering individually or as part of a collaborative essay. If more than one is uploaded, all except the first will be disqualified. (On the rare occasion when a replacement is requested by FQXi, this will be handled outside of the usual submission system.) Collaborative essays written by more than one person can be submitted. If such an entry is awarded a Prize, it will be split equally among the collaborators.

- Sponsors reserve the right to cancel or modify this Contest in the event that an insufficient number of entries are received that meet the minimum judging criteria.
- This Contest shall be construed in accordance with U.S. law. All Federal, state and local laws and regulations apply.
- Essays complying with the rules and satisfying minimal relevance and quality criteria will be automatically posted on the FQXi Community Forum website together with authors' names; after Prizes are awarded, contest Winners will be highlighted as such. The Sponsors reserve no copyrights to the submitted work; however, by submitting an entry, the applicant hereby grants to the Sponsors a worldwide, royalty free license to so post the essay, as well as use the essay for internal and advertising, marketing and promotional purposes of the Contest, in perpetuity, in any and all media now known or hereafter invented.
- By submitting an essay, entrant represents and warrants that the essay is entrant's own creation and is 100% original work; is not subject to, and does not infringe upon, the rights of any third parties, including without limitation, copyright, trademark or privacy or publicity rights; and is not defamatory, obscene or otherwise illegal.
- Entrants not complying with these requirements will be subject to disqualification. All entrants must have a valid email address. In case of dispute as to identity of entrant, entry will be declared made by the authorized account holder of the email address submitted at time of entry. "Authorized Account Holder" is defined as the natural person who is assigned an email address by an Internet access provider, online service provider, or other organization (e.g., business, educational, institution, etc.) responsible for assigning email addresses or the domain associated with the submitted email address. Any other attempted form of entry is prohibited; no automatic, programmed; robotic or similar means of entry are permitted. The Contest Entities are not responsible for technical, hardware, software, telephone or other communications malfunctions, errors or failures of any kind, lost or unavailable network connections, website, Internet, or ISP unavailability, unauthorized human intervention, traffic congestion, incomplete or inaccurate capture of entry information (regardless of cause) or failed, incomplete, garbled, jumbled or delayed computer transmissions which may limit one's ability to enter this Contest, including any injury or damage to participant's or any other person's computer relating to or resulting from participating in this Contest or downloading any materials in this Contest.
- All Prizes are subject to United States Income Tax. Winners are required to furnish FQXi with appropriate tax forms for reporting the Prize, and applicable taxes may be withheld from the Prize.
- Void where prohibited by law. FQXi reserves the right to refuse to award any Prize if doing so violates any applicable laws.
- By submitting an entry in the contest, the author agrees to release, defend and hold harmless the Contest Entities and each of their respective directors, officers, employees, agents, volunteers, the Contest judges, and their affiliates, heirs, successors and assigns from and against, and waive any right to pursue, any and all claims of any nature whatsoever arising out of or in connection with the Contest, the selection of Winners, and the use of the submitted essay, the author's name, and biographical information as authorized under these Contest rules.
- All decisions of the judges are final and the selection of Winners is at the sole and absolute discretion of FQXi.
- **NOTIFICATION & ACCEPTANCE**
  - Potential Winners will be notified by e-mail by November 30, 2012 and may be required to execute and return an Affidavit of Eligibility/Release/Prize Acceptance Form within fourteen (14) days of attempted notification. Each participant selected as a potential Winner must comply with all terms and conditions set forth in these Official Rules, and winning is contingent upon fulfilling all such requirements. If the Winner cannot be contacted within (7) calendar days of first notification attempt, if prize or prize notification is

returned as undeliverable, if Winner rejects his/her prize or in the event of noncompliance with these Contest Official Rules, such prize will be forfeited and an alternate Winner will be selected from all remaining eligible entries. Upon prize forfeiture, no compensation will be given.

- The names of Winners will be posted at [www.fqxi.org](http://www.fqxi.org) by December 7, 2012, and will also be available by sending a self-addressed stamped envelope FQXi Essay Contest Winner's List [PO Box 3022, New York, NY 10163], no later than February 28, 2013.
- **GENERAL:** Acceptance of a prize constitutes permission by Winner to use of his/her name, photograph and/or likeness for advertising, publicity and promotion purposes without compensation (unless prohibited by law).
- **CAUTION:** ANY ATTEMPT BY AN ENTRANT TO DELIBERATELY DAMAGE ANY WEB SITE OR UNDERMINE THE LEGITIMATE OPERATION OF THE PROMOTION MAY BE A VIOLATION OF CRIMINAL AND CIVIL LAWS AND SHOULD SUCH AN ATTEMPT BE MADE, THE CONTEST ENTITIES RESERVE THE RIGHT TO SEEK DAMAGES FROM ANY SUCH PERSON TO THE FULLEST EXTENT PERMITTED BY LAW.

## V. SPONSORS

- [Foundational Questions Institute](#) - PO Box 3022, New York, NY, 10163
- [Peter & Patricia Gruber Foundation](#) - 140 W 57th Street, Suite 10C, New York, NY 10019
- [Submeta](#) - 751 Laurel Street, #724, San Carlos, CA 94070

## VI. MEDIA PARTNER

- [Scientific American](#) - 75 Varick Street, 9th Floor, New York, NY 10013-1917