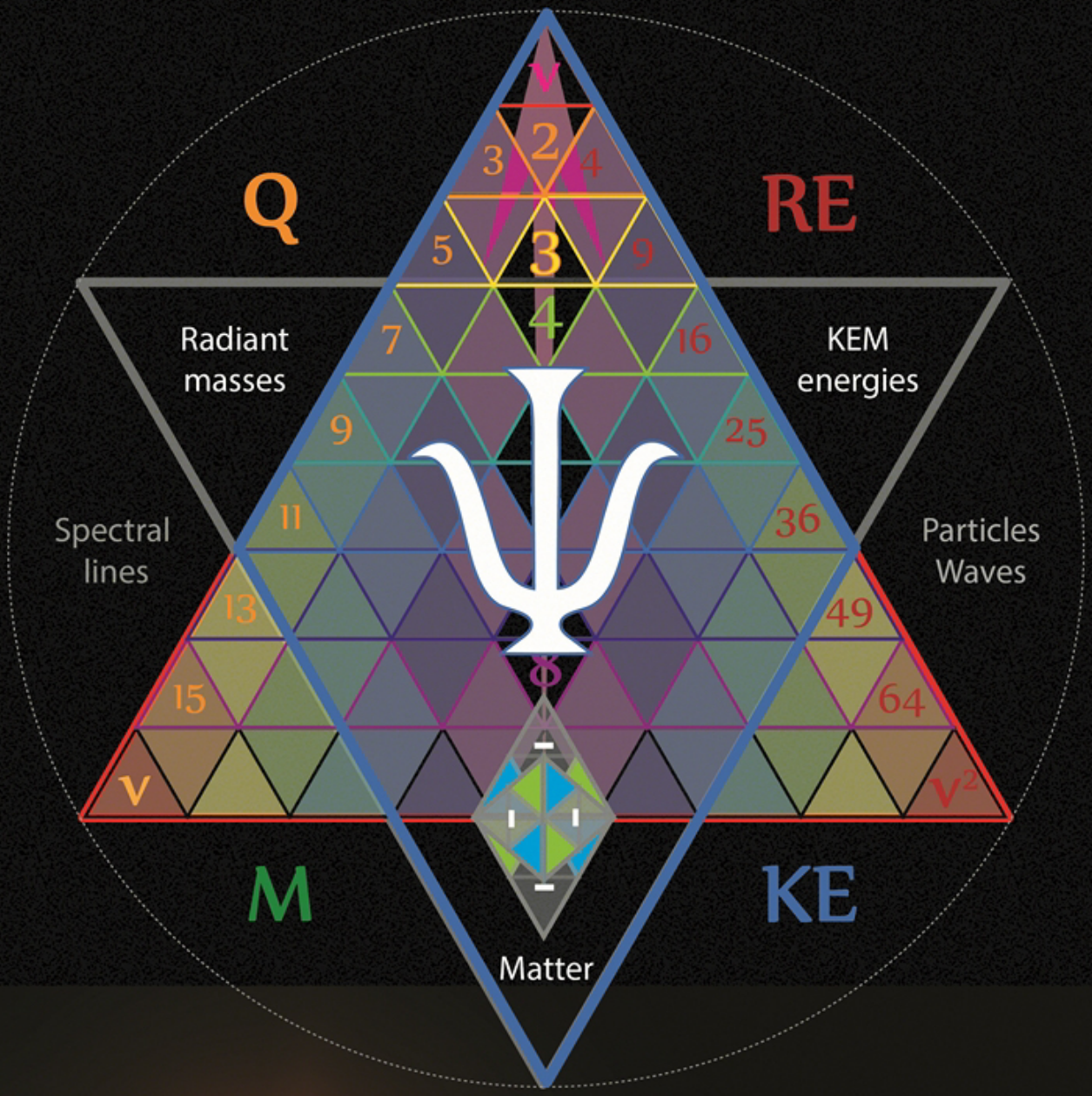
TETRYONICS

The Charged geometry of Quantum Electro Dynamics



FOUNDATION OF ELECTRO-DYNAMICS

Abraham

ISBN 978-0-98[illegible]288-1-[illegible]
[First Edition 2012]

Maxwell's Equations

$$\oint \vec{E}\cdot d\vec{A} = \frac{q}{\varepsilon_0}$$
Gauss's Law for Electricity

$$\oint \vec{B}\cdot d\vec{A} = 0$$
Gauss's Law for Magnetism

$$\oint \vec{E}\cdot d\vec{s} = \frac{-d\Phi_B}{dt}$$
Faraday's Law

$$\oint \vec{B}\cdot d\vec{s} = \mu_0 i + \frac{\mu_0 \varepsilon_0 d\Phi_E}{dt}$$
Ampere's Law

E = electric field
A = area
q = charge
ε_0 = permittivity of free space (a constant)
B = magnetic field intensity
s = path length
Φ_B = magnetic flux
Φ_E = electric flux
t = time
μ_0 = permeability of free space (a constant)
i = current electric charge
$\mu_0\varepsilon_0$ = $1/c^2$, where c=speed of light

Gauss' Law of Electric Flux

(1) electric field diverges from electric charge, an expression of the Coulomb force,

Gauss' Law of Zero Nett Magnetism

2) there are no isolated magnetic poles, but the Henry force acts between the poles of a magnet,

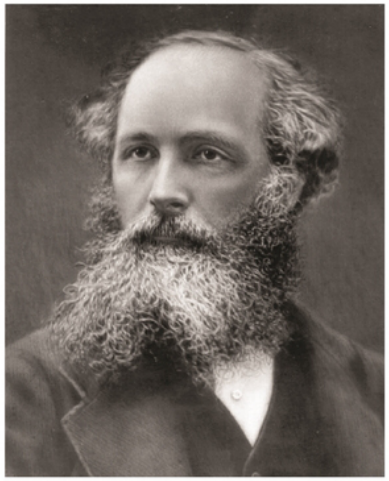
Faraday's Law of Inductance

3) electric fields are produced by changing magnetic fields,

Ampere's Circuital Law

4) circulating magnetic fields are produced by moving electric fields and by electric currents.

James Clerk Maxwell



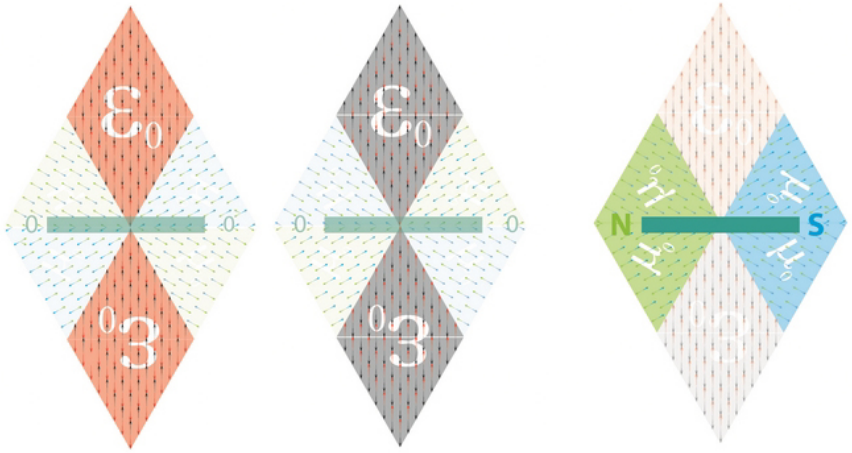
(13 June 1831 – 5 November 1879)

Maxwell's equations are a Mathematical representation of Energy within Tetryonic geometry

Opposites ATTRACT - Similars REPEL

Charged ZPF sets produce neutralised magnetic dipole moments

Neutral ZPF sets produce strong magnetic dipole moments



\+ − 0

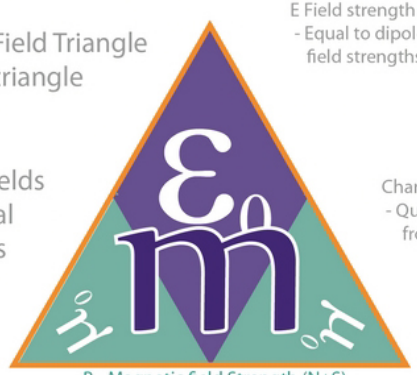
Only TWO types of EM fields exist POSITIVE (Counter-clockwise) and NEGATIVE (Clockwise circulating fields)

Planck Energy of EM Field Triangle
- Surface area of EM triangle

E Field strength
- Equal to dipole Magnetic field strengths

The Magnetic and Electric fields are DIRECTLY proportional to each other at all times

Charge of EM Field Triangle
- Quanta number resulting from Energy geometry



B - Magnetic field Strength (N+S)
MAGNETIC BIPOLAR FIELD

Electric field generates a BIPOLAR Magnetic field (No Magnetic Monopoles)

The Magnetic field is ALWAYS propogated orthagonally with respect to the Electric field

Gauss' Laws

- Gauss' Law of Electric Flux and
- Gauss' Law of Magnetic dipoles

The laws were formulated by Carl Friedrich Gauss in 1835, but was not published until 1867.

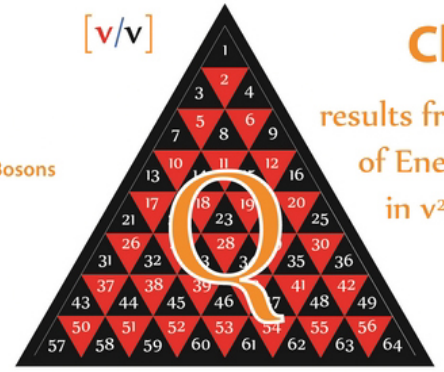
They form two of Maxwell's equations which are the basis of classical electrodynamics.

The other two being:
- Faraday's law of induction, and
- Ampère's law with Maxwell's correction.

Gauss's law can be used to derive Coulomb's law, and vice versa.

Equilateral triangles are the foundational geometry of EM mass-Energy, Charge and Matter

[v/v]



Bosons

Charge

results from an inbalance of Energy momenta in v^2 geometries

[v/v]

Bosons

Carl Friedrich Gauss

(30 April 1777 – 23 February 1855)

Although originally envisaged as a property applied to spherical geometries and usually illustrated with square sectional boundaries integrating a surface Charges are shown to be a geometric property of tessellated equilateral triangles

Integral form

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0} = 4\pi k q$$

Differential form

$$\nabla \cdot E = \frac{\rho}{\varepsilon_0} = 4\pi k \rho$$

The electric flux through any closed surface is proportional to the enclosed electric charge

$$\Phi = EA = E4\pi r^2 = \frac{Q}{\varepsilon_0}$$

Integral form

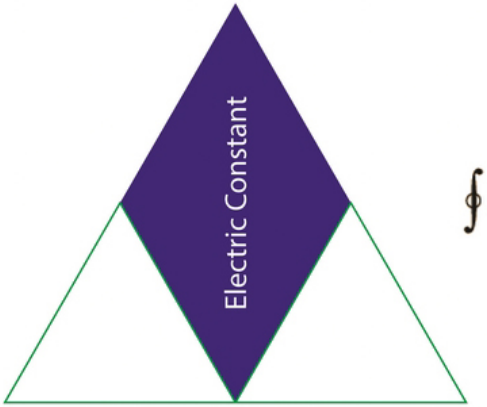
$$\oint \vec{B} \cdot d\vec{A} = 0$$

Differential form

$$\nabla \cdot B = 0$$

There are NO Magnetic Monopoles

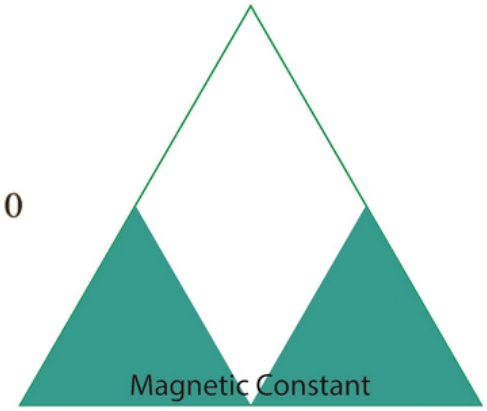
[v/v]



$$\varepsilon_0 = 8.85418785\text{e-}12 \ \frac{F}{m}$$

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0}$$

$$\oint \vec{B} \cdot d\vec{A} = 0$$



$$\mu_0 = 1.25663706\text{e-}6 \ \frac{H}{m}$$

Magnetic dipole field

Ampere's Law

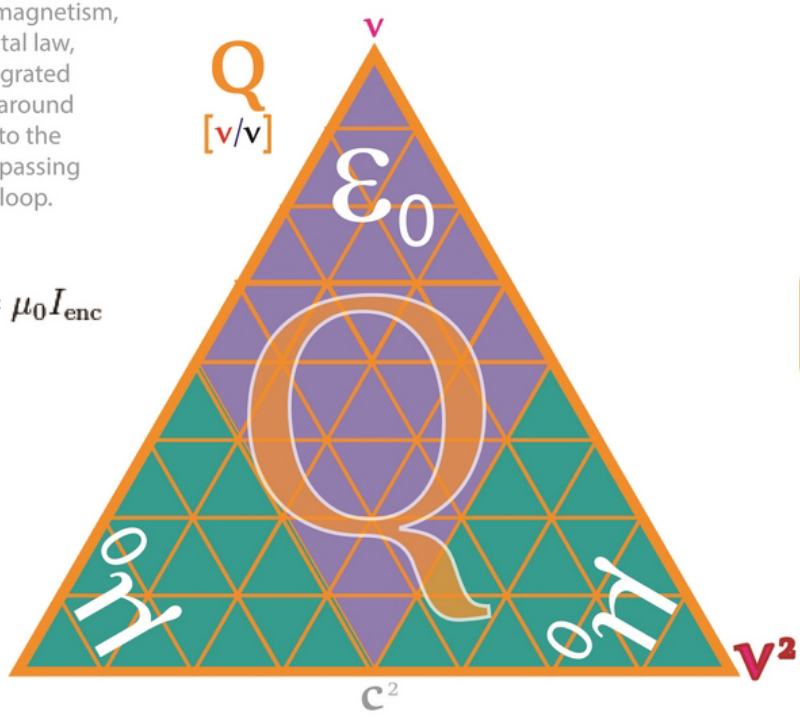
Andre Ampere

(20 January 1775 – 10 June 1836)

In classical electromagnetism, Ampère's circuital law, relates the integrated magnetic field around a closed loop to the electric current passing through the loop.

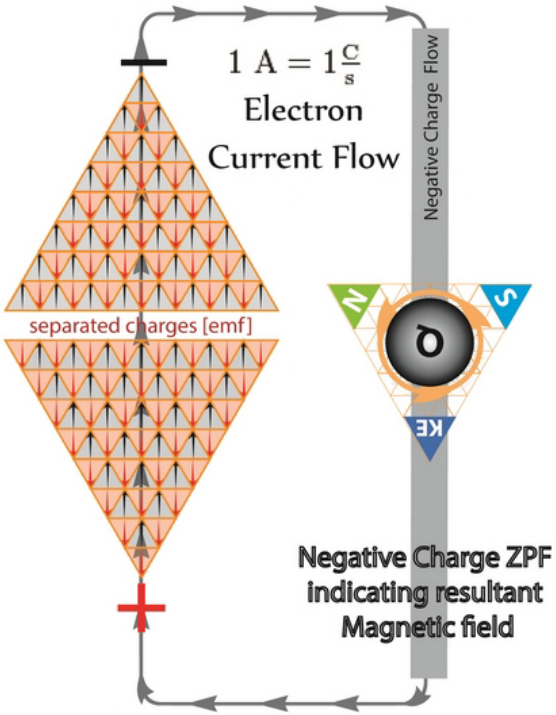
$$\oint_C \mathbf{B} \cdot \mathrm{d}\boldsymbol{\ell} = \mu_0 I_{\mathrm{enc}}$$

ElectroMagnetic field geometry



The nett Charge of any surface is a result of its formative Tetryonic geometry and theENERGY imbalances that arise from it

$$\oint \vec{B} \cdot \vec{ds} = \mu_0 i + \frac{1}{c^2} \frac{\partial}{\partial t} \int \vec{E} \cdot d\vec{A}$$

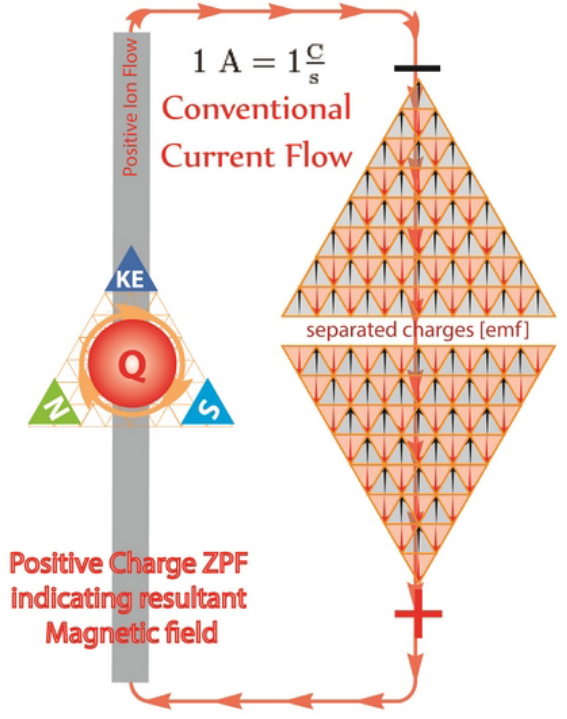


Negative Charge ZPF indicating resultant Magnetic field

The Closed circuit or loop can be any geometric shape with Tetryonics dictating equilateral triangular geometries for EM Energy and Planck quantum charges along with Tetrahedral geometries for Matter

$$\mathbf{J_f} + \mathbf{J_D} + \mathbf{J_M} = \mathbf{J_f} + \mathbf{J_P} + \mathbf{J_M} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t} = \mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t} \,,$$

With the addition of Maxwell's Displacement current to Ampere's Law it can be shown that Light is an Electro-Magnetic wave paving the way forward for Planck, Lorentz and Tetryonics



Positive Charge ZPF indicating resultant Magnetic field

Faraday's Law of Induction

Electric and Magnetic Fields
are manifestations of the
energy in an EM field

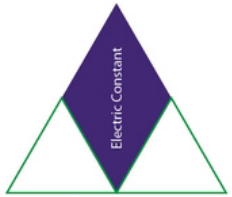
Faraday's law states that:
The induced electromotive force (emf)
in any closed circuit is equal to the
time rate of change of the magnetic
flux through the circuit.

$$\oint \vec{E} \cdot \vec{ds} = -\frac{d\Phi_B}{dt}$$

The motion of EM fields creates
an induced motion in external
fields and particles

Michael Faraday

(22 September 1791 – 25 August 1867)

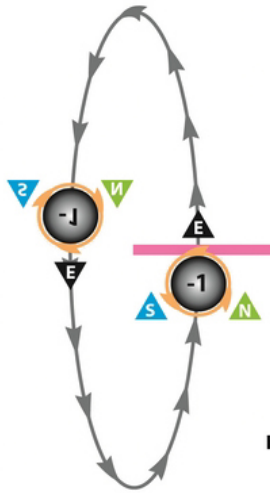


In the frame of a conductor moving
relative to the magnet,
the conductor experiences
a force due to an electric field.

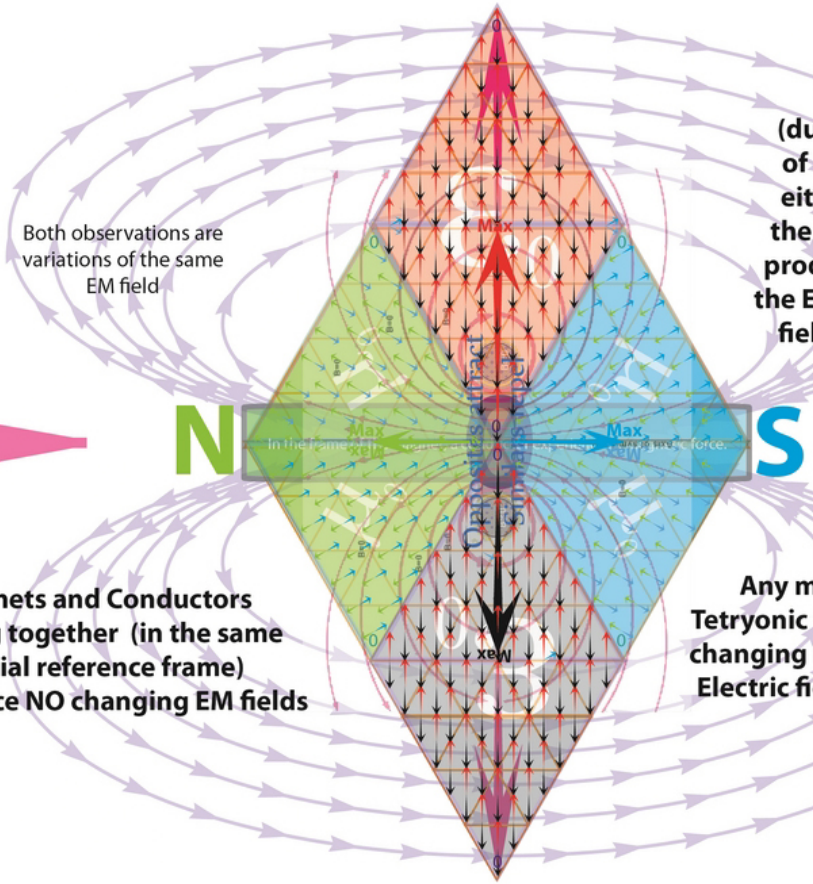
A magnet has both
Magnetic dipole fields and
neutralised Electric fields
surrounding it

Magnet

Conductor

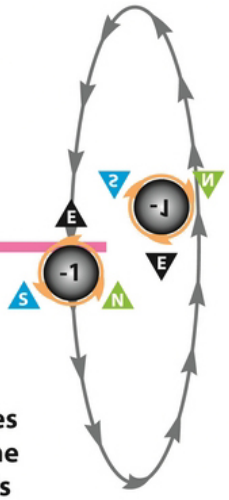


Both observations are
variations of the same
EM field



It is impossible (due to the geometry of EM fields) to move either the Magnet or the Conductor without producing variations in the Electric and Magnetic fields of either source

Conductor



Magnets and Conductors moving together (in the same inertial reference frame) experience NO changing EM fields

Any motion relative to the Tetryonic field geometry produces changing Force vectors in both the Electric fields and Magnetic fields

The direction of motion with respect to each other produces differing directions of induced force (current flow)

The magnetic field in the frame of the magnet and the electric field in the frame of the conductor must generate consistent Force results in the conductor.

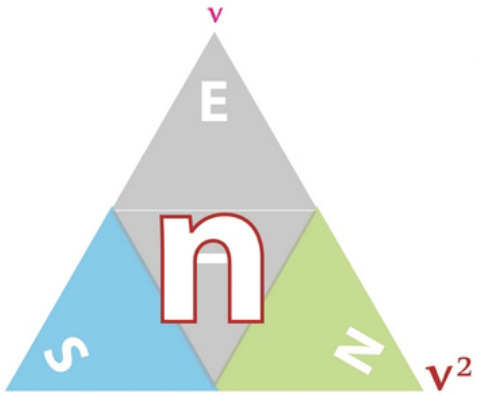
An Electrostatic (charged) particle
has both
Electric and neutralised Magnetic
fields comprising it

Volts

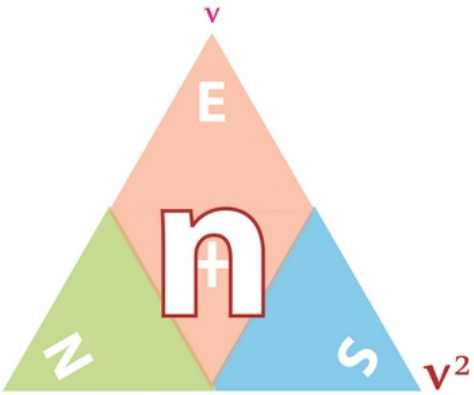
[Joules per Coulomb]

Any accumulation (and resultant imbalance)
of separated electrostatic charges, results in a voltage.
[Potential Difference]

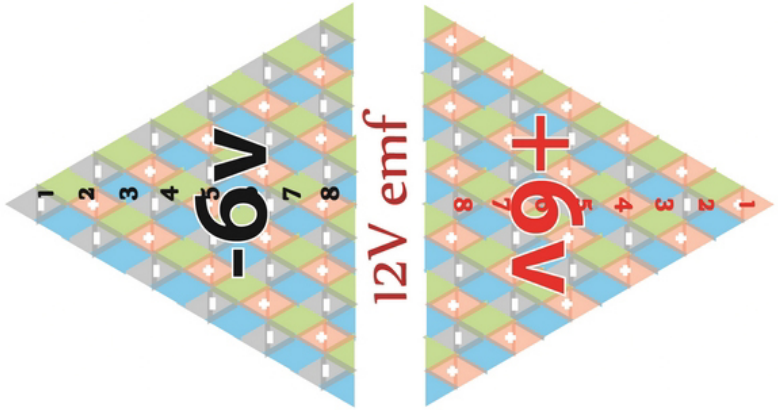
$$V = \frac{W}{A} = \frac{J}{A \cdot s} = \frac{N \cdot m}{A \cdot s} = \frac{kg \cdot m^2}{A \cdot s^3} = \frac{kg \cdot m^2}{C \cdot s^2} = \frac{N \cdot m}{C} = \frac{J}{C}$$

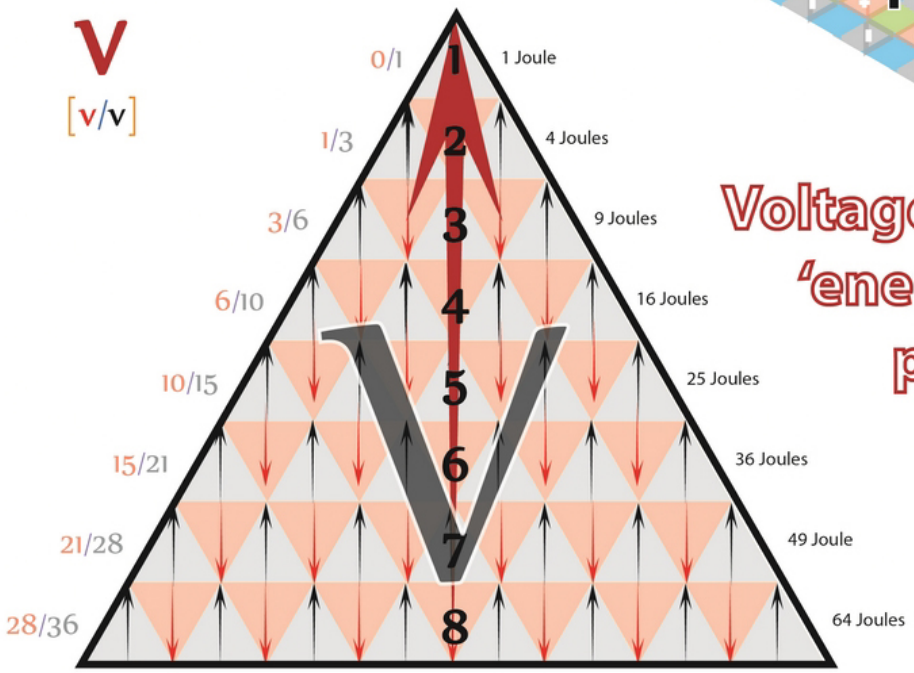


Negative charge



Positive charge

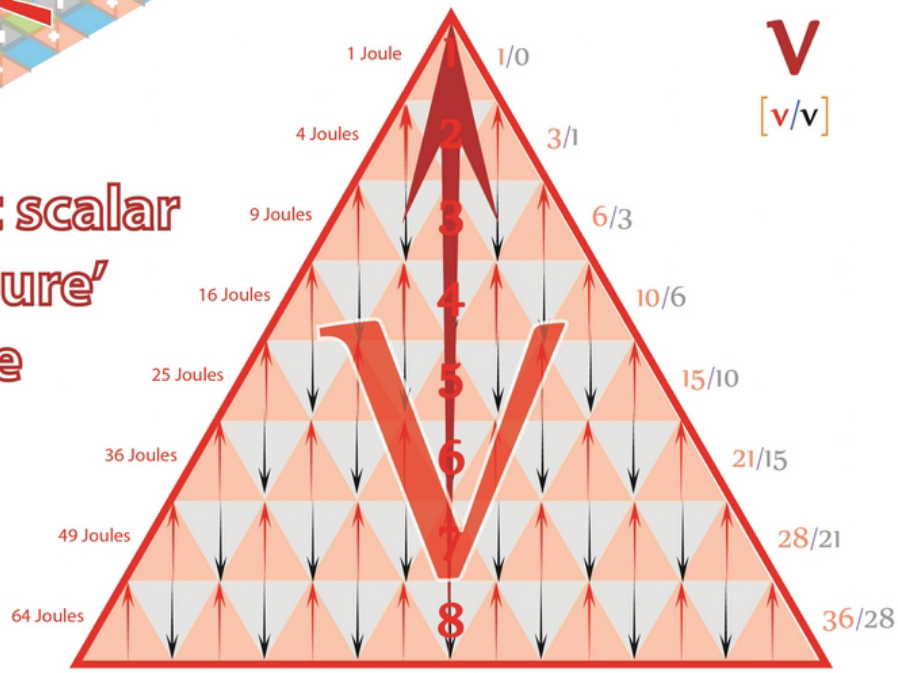




Negative voltage

[Joules per Coulomb]

Voltage is a nett scalar
'energy pressure'
per charge



Positive voltage

[Joules per Coulomb]

Joule

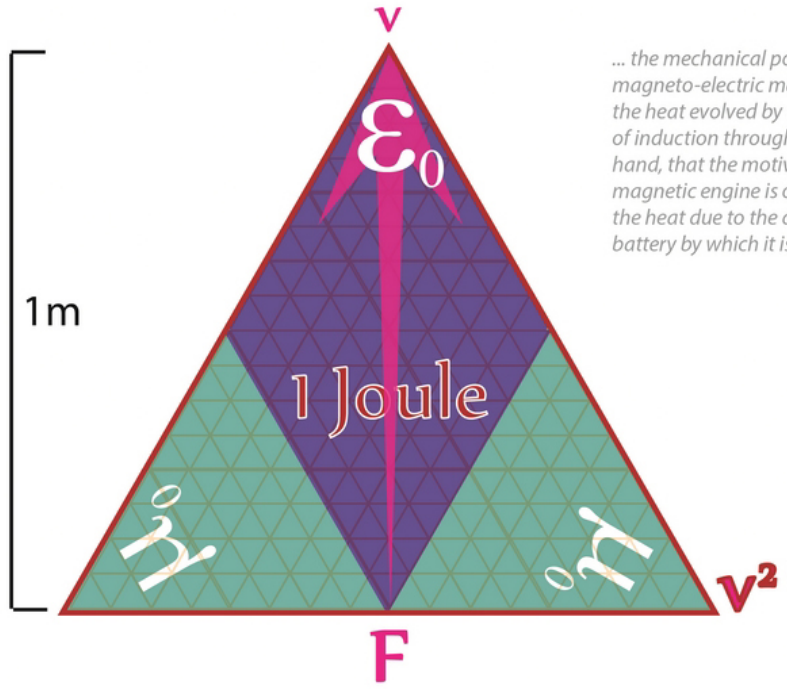
is a derived unit of energy or work.

$$F = ma$$

The vector-force on a particle equals the product of its mass and its vector acceleration

$$\frac{F}{a} = m = \frac{E}{c^2}$$

or.....the Energy-Momenta provided in c^2 geometry able to do work



... the mechanical power exerted in turning a magneto-electric machine is converted into the heat evolved by the passage of the currents of induction through its coils; and, on the other hand, that the motive power of the electro-magnetic engine is obtained at the expense of the heat due to the chemical reactions of the battery by which it is worked

(1845)

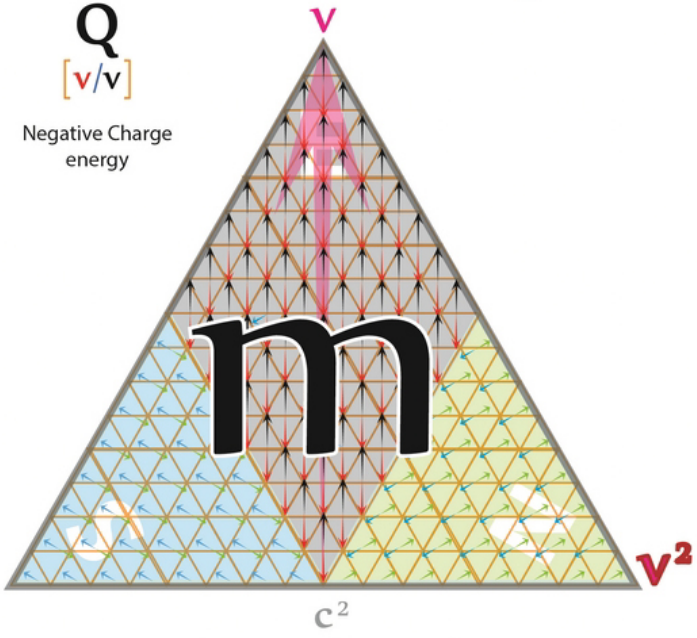
James Prescott Joule

(24 December 1818 – 11 October 1889)

$$T\pi \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

mass; EM Field; Planck quanta; ElectroMagnetic; mass; velocity

$$J = \frac{kg \cdot m^2}{s^2} = N \cdot m = Pa \cdot m^3 = W \cdot s$$



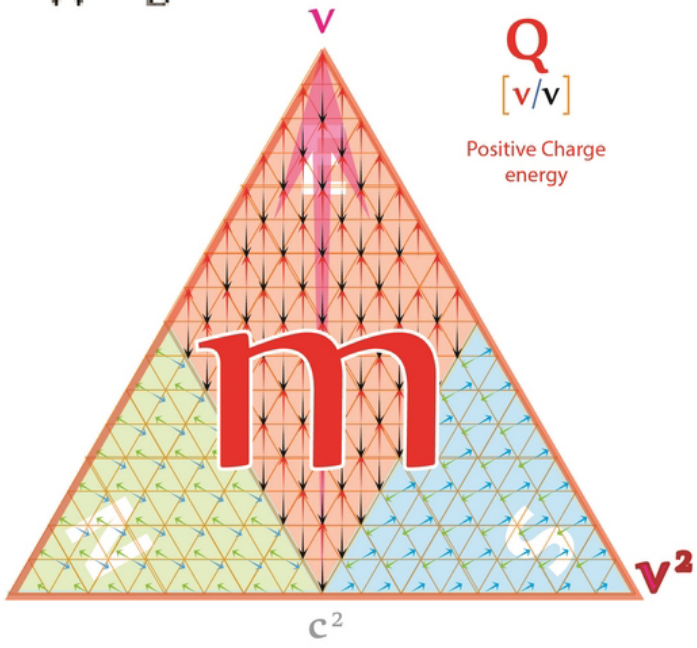
Energy $kg.\frac{m^2}{s^2}$

It is equal to the energy expended (or work done) in applying a force of one newton through a distance of one meter (1 newton metre or N·m), or in passing an electric current of one ampere through a resistance of one ohm for one second

Planck's Constant x frequency $\left[kg.\frac{m^2}{s}\right].s^{-1}$

mass x velocity squared $kg.\left[\frac{m}{s}\right]^2$

Momentum x velocity $\left[kg.\frac{m}{s}\right].\frac{m}{s}$



Charged EM masses

Coulombs

$$1\text{C} = 1\text{A} \cdot 1\text{s}$$

It is defined as the charge transported by a steady current of one ampere in one second.

C

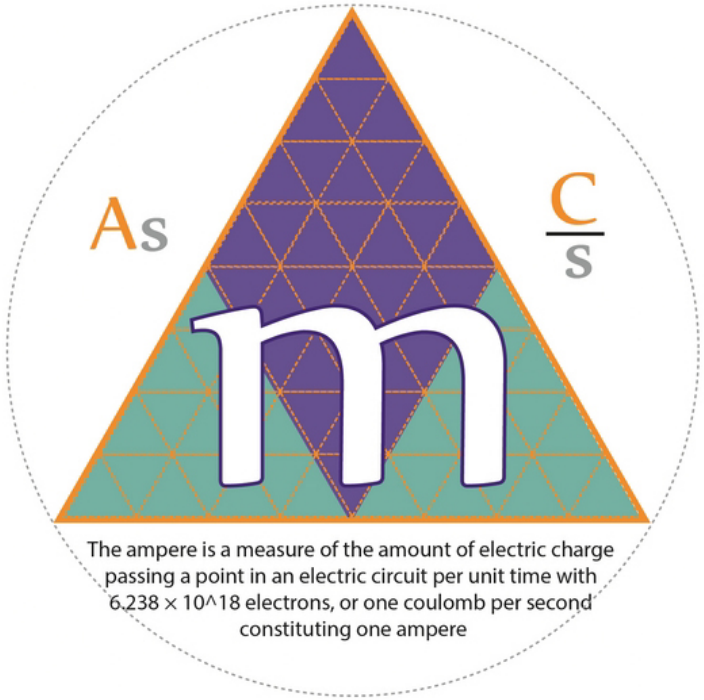
An elementary charge is 1.602845472 e-19 C

$\frac{s}{kg}$

charge per mass

1.81082 e-11 $\frac{s}{kg}$

seconds per mass



I

$\frac{kg}{s}$

mass per charge

5.522357 e-12 $\frac{kg}{s}$

mass per second

Amperes

$$1\,\text{A} = 1\frac{\text{C}}{\text{s}}$$

The amount of electric charge passing a point per unit time

A

6.238904 e18 electrons passing a given point each second constitutes one ampere.

Electric current is a measure of the flow of electrically charged masses in a circuit that contains an electrical Voltage potential

As

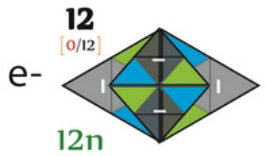
Amperes seconds $\left[\frac{kg}{s}.s\right] \approx \left[\frac{s}{kg}\ \frac{1}{s}\right]$ Coulombs per second

Current flow in 1 second — Coulombs per second

are a measure of EM mass

$\frac{C}{s}$

Current

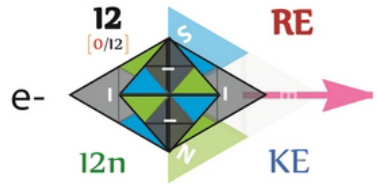


$$I = \frac{V}{R}$$

CURRENT [Charge flow]

VOLTAGE [Electric Charge pressure]

RESISTANCE [electrical conductivity]



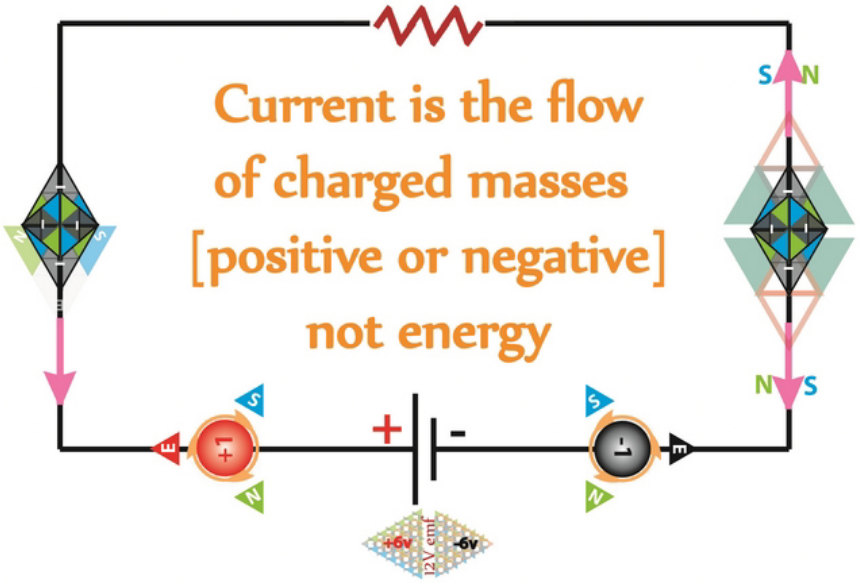
Current is a measure of the flow of electrons (charge geometries) past a point over a specific time

Stationary charge

The speed of the charges in a circuit is proportional to the value of Electric current

Charge in motion

Current flow produces magnetic fields around conductive wires



DC

N S

Charges flow in ONE direction

AC

S N

N S

Charges change direction periodically

Conventional current flow

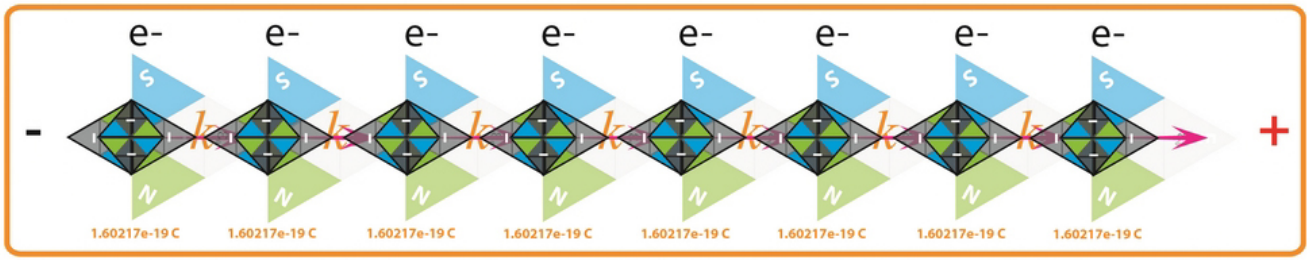
A Positive charge moving in one direction
is the same as
A Negative charge moving in the opposite direction

Electron current flow

6.238904607 e18 electrons

As

1C



1A

$\frac{C}{S}$

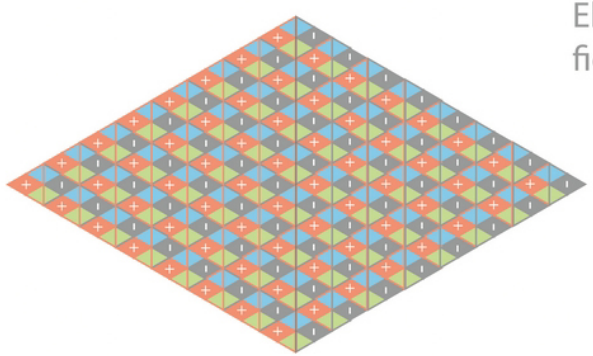
5.52235771 e-12 kg

1C is defined as the charge transported by a steady current of one ampere in one second

1 second

Power

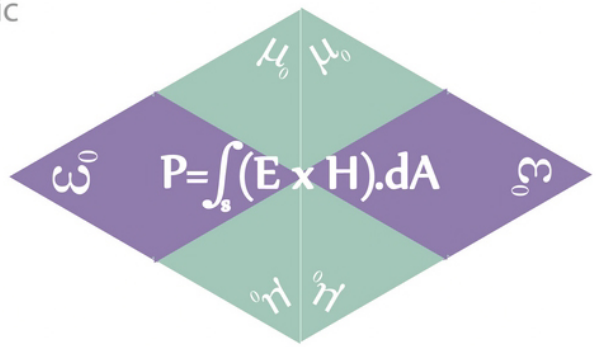
Electrical power flows wherever Electric and Magnetic fields exist together and fluctuate in the same place.



All energy is comprised of 2D planck quanta

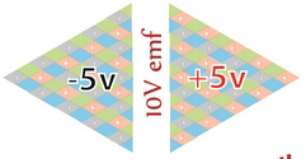
Electric power is defined as the rate at which electrical energy is transferred by an electric circuit.

This is the integral of the cross-product of the electrical and magnetic field vectors over a specified area

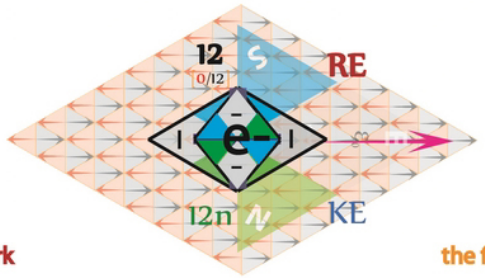


The result is a scalar since it is the surface integral of the Poynting vector.

$$P = I^2.R = \frac{V^2}{R}$$

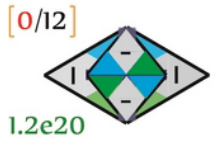


Voltage
the potential to do work

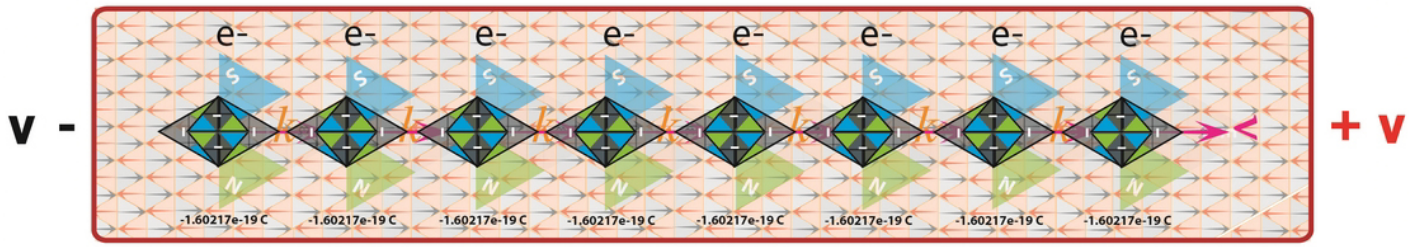


$$P = V.I$$

Current
the flow of charged Matter



Electrical power propagtes at the speed of light in an electrical circuit [dependent on the voltage source]
electrons have a vastly slower 'drift' velocity resulting from their interaction with the Electric voltage field



Voltage Current

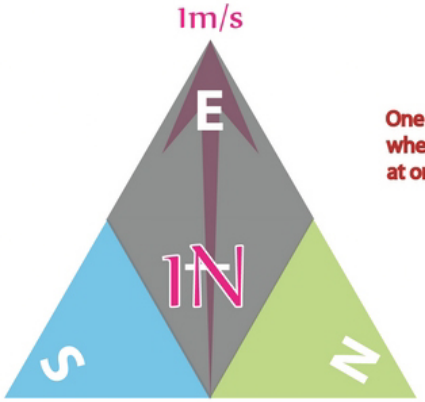
As

Power is a measure of the flow of electrons created by a measured Potential difference per unit of time

$\frac{C}{s}$

Volts & Watts

[Joules per Coulomb] [Joules]



In Classical Mechanics

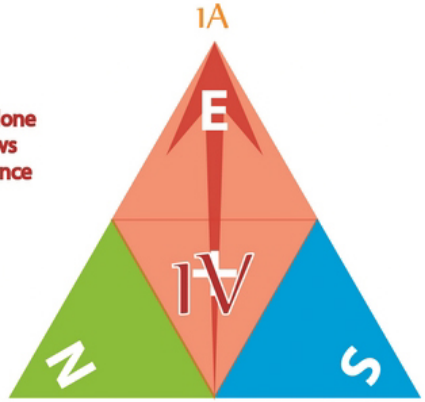
One watt is the rate at which work is done when an object's velocity is held constant at one meter per second against constant opposing force of one newton.

James Watt

(19 January 1736 – 25 August 1819)

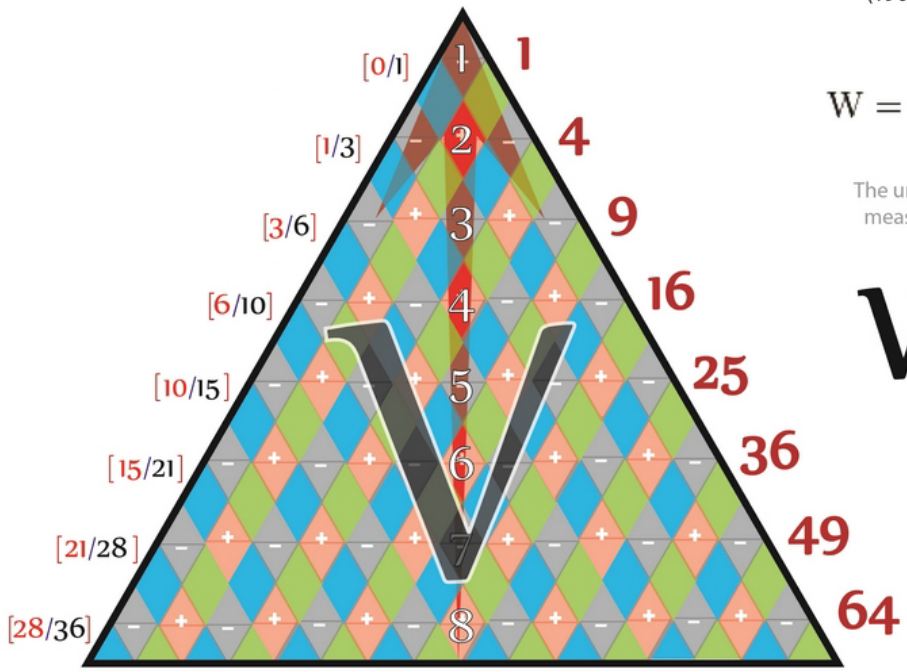
In ElectroDynamics

One watt is the rate at which work is done when one ampere (A) of current flows through an electrical potential difference of one volt (V).



Negative charge

Positive charge



Negative voltage

[Joules per Coulomb]

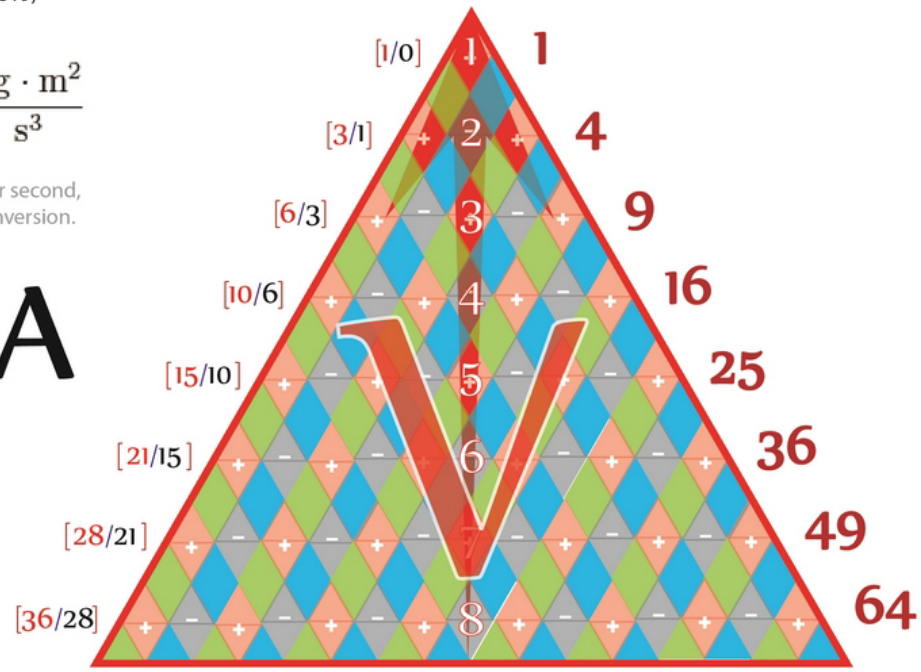
$$W = \frac{J}{s} = \frac{N \cdot m}{s} = \frac{kg \cdot m^2}{s^3}$$

The unit, defined as one joule per second, measures the rate of energy conversion.

W=V.A

Planck quanta/second

[Joule-seconds/sec]



Positive voltage

[Joules per Coulomb]

OHM's Law

resistivity

$$E = \rho J$$

Electric field — Current density

General vector equation

Voltage is the force motivating charges to "flow" in a circuit, it is measured as the difference in electrical potential between two points in a circuit

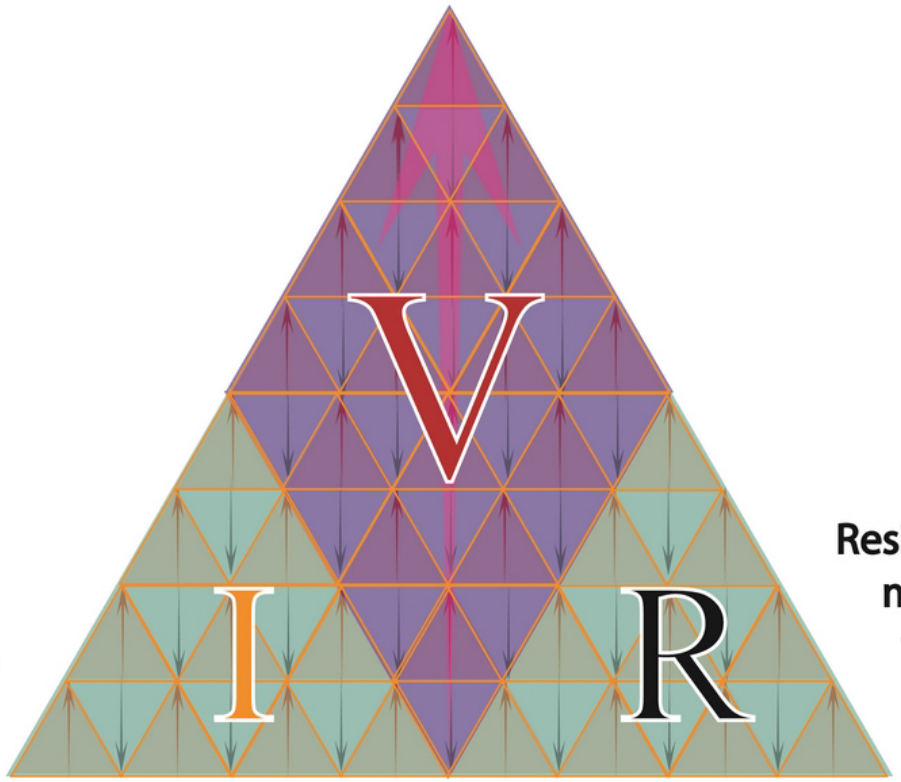
$$V = I.R$$

Georg Simon Ohm

(16 March 1789 – 6 July 1854)

$$I = \frac{V}{R}$$

Current is the flow of Charged mass resulting from an electromotive force



$$R = \frac{V}{I}$$

Resistance determines how much current will flow through a conductor

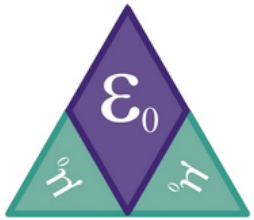
$$P = I.V = I^2.R$$

Power is the amount of current times the voltage level at a given point measured in wattage or watts.

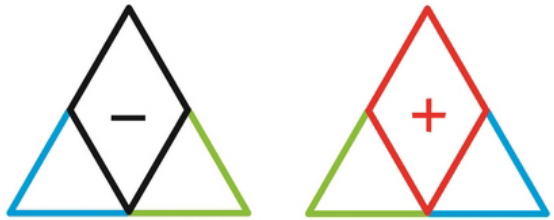
Ohm's law states that the current through a conductor between two points is directly proportional to the potential difference across the two points.

Introducing the constant of proportionality, the resistance, one arrives at the usual mathematical equation that describes this relationship:

Electricity

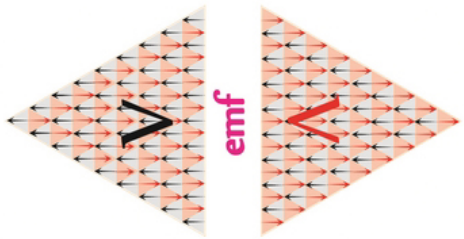


Electromagnetism: a fundamental interaction between the magnetic field and the presence and motion of an electric charge.



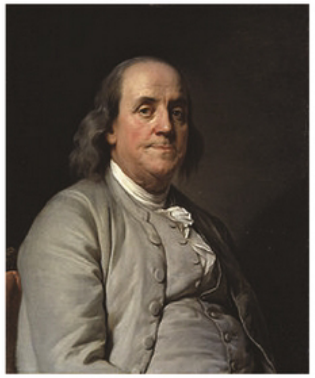
"There exists Negative and Positive electrical quanta under different pressures"

Electric charge: the geometry of EM Energy momenta, also determines their electromagnetic interactions. Electrically charged Matter is influenced by, and produces, electromagnetic fields when in motion



Electricity is the flow of Energy between separated Charge potentials when an electric circuit is formed measured in Volts [Joules/C]

Benjamin Franklin



(January 17, 1706 – April 17, 1790)

Charles-Augustin de Coulomb
(14 September 1736 – 23 August 1806)

Andre Ampere
(20 January 1775 – 10 June 1836)

Georg Simon Ohm
(16 March 1789 – 6 July 1854)

Carl Friedrich Gauss
(30 April 1777 – 23 February 1855)

Heinrich Lenz
(February 12, 1804 – February 10, 1865)

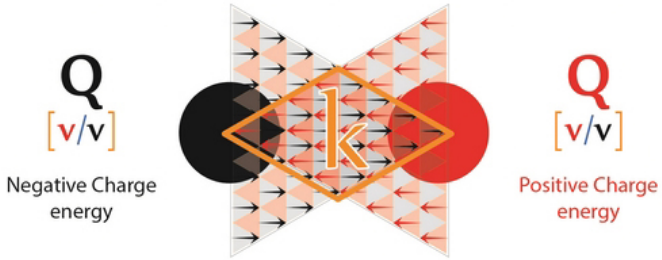
Michael Faraday
(22 September 1791 – 25 August 1867)

James Clerk Maxwell
(13 June 1831 – 5 November 1879)

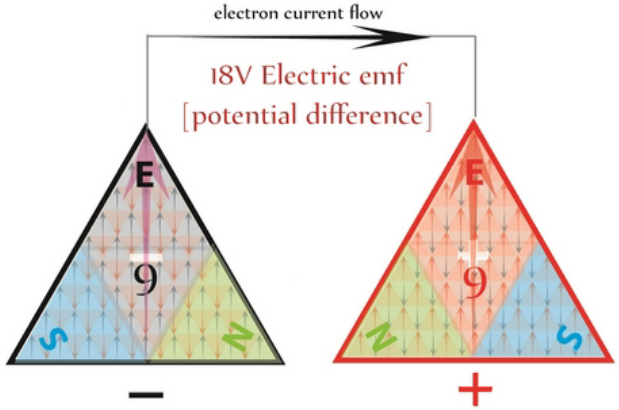
James Prescott Joule
(24 December 1818 – 11 October 1889)

John Henry Poynting
(9 September 1852 – 30 March 1914)

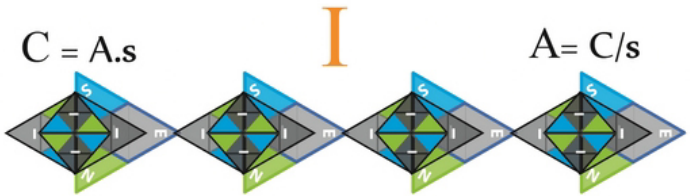
Nikola Tesla
(10 July 1856 – 7 January 1943)



Electric field: an influence produced by an electric charge on other charges in its vicinity.



Electric potential: the capacity of an electric field to do work on an electric charge, typically measured in volts..

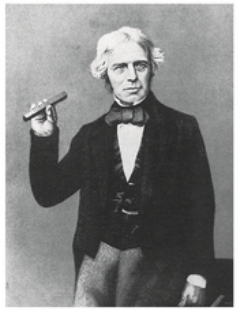


Electric current: is a secondary effect resulting from electrical energy in a circuit it is the movement or flow of electrically charged particles, typically measured in amperes.

Electricity is a general term encompassing a variety of phenomena resulting from the presence and flow of electric charge.
These include many easily recognizable phenomena, such as lightning, static electricity, and the flow of electrical current in an electrical wire.
In addition, electricity encompasses less familiar concepts such as the electromagnetic field and electromagnetic induction.

Changing Magnetic fields
produce changing Electric fields

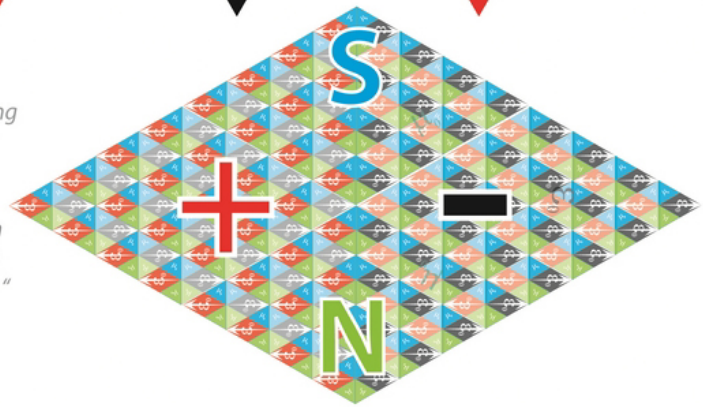
Michael Faraday



(22 September 1791 – 25 August 1867)

" It is proposed that if a changing magnetic field can make an electric field, then

a changing electric field (from an oscillating electric charge) should make a magnetic field "

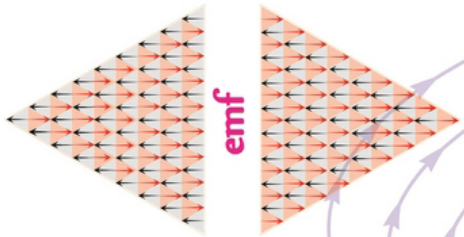


The 'changing' EM fields are a direct result of the inherent equilateral symmetry of the EM fields

Changing Electric Fields
produce changing Magnetic fields

EM Inductive circuits

The Electrical emf created by the separated charges in the neutral EM field will flow when a conductor inserted



Electricity is the flow of Energy between separated Charge potentials when an electric circuit is formed measured in Volts [Joules/C]

Neutral Electric field with Magnetic dipole

Current is produced in a conductor when it is moved through a magnetic field because the neutralised Electric field lines are applying a emf on the free electrons in the conductor and causing them to move.

This process of generating current in a conductor by placing the conductor in a changing magnetic field is called induction

The stronger the Magnetic dipole the greater the potential emf

If electrical current is flowing in a conductor, there is an associated magnetic field created around the wire.

In a similar manner, if we move a wire inside a magnetic field there will be an electrical current that will be generated in the wire.

Magnets can be considered to be stored (static) emf potential fields

Magnetic DIpole with Neutral Electric field

Magentic Dipole stength is dependent on:

The total number of Turns in the Inductor
The current flowing through the circuit

$$|\mathcal{E}| = N\left|\frac{d\Phi_B}{dt}\right|$$

eg: 64 Turn inductor increases the field energy of the Magnetic dipole from 1n (for a straight wire) to 64n

John Henry Poynting

(9 September 1852 – 30 March 1914)

There is an electric field running down the middle of the wire, which extends to just beyond its surface.

This electric field pushes the charges along against the resistance and adds to the electric field caused by the surface charges. The resultant electric field changes its direction around the circuit as the wires form a loop back to the battery.

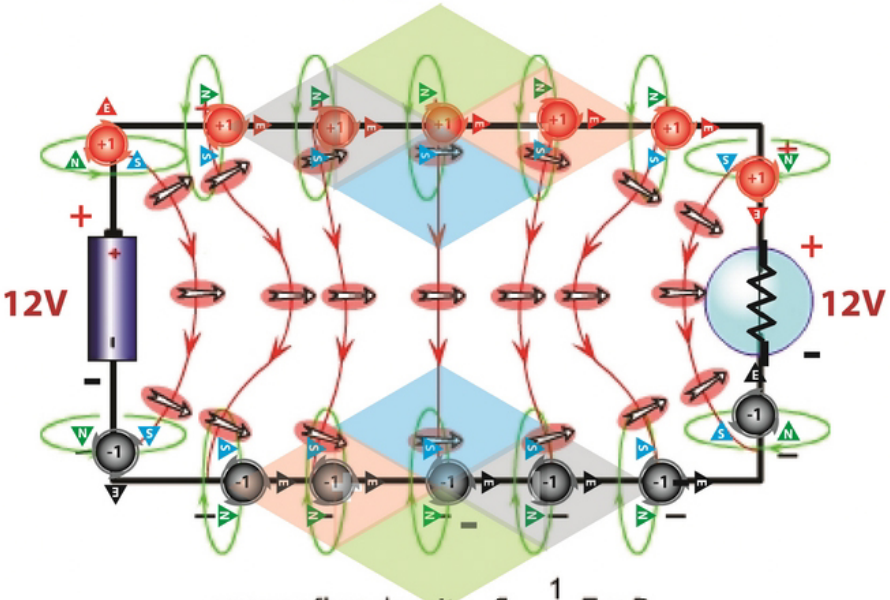
The moving charges inside the wire cause a magnetic field around the wire

Energy is the sum of all Electric and Magnetic fields created in a circuit

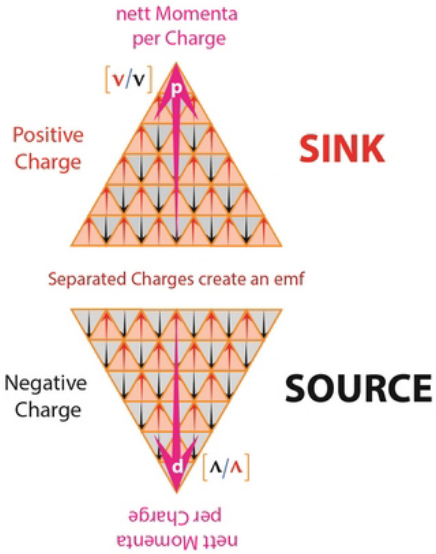
Poynting Field

$$\mathbf{S} = \mathbf{E} \times \mathbf{H}$$

Energy is transferred along a conductive path in an Electrical circuit accelerating charged particles and ions in turn imbuing them with Kinetic Energy [voltage leads current]

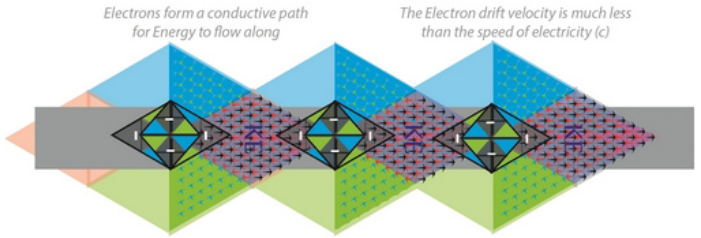


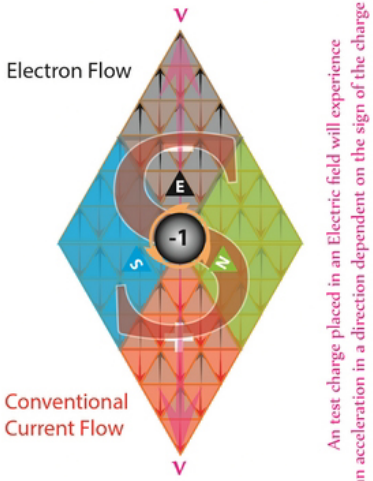
energy flux density, $S = \frac{1}{\mu_0} E \times B$



Energy is transferred through empty space around (and NOT in) the wires of an electric circuit via an electromagnetic field called the Poynting field

It's important to remember that the current doesn't flow in both directions, only the energy does





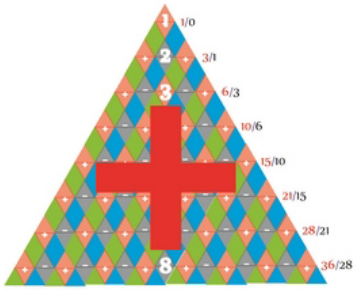
Poynting Vectors

Current is the flow of charge imbalance masses within a circuit

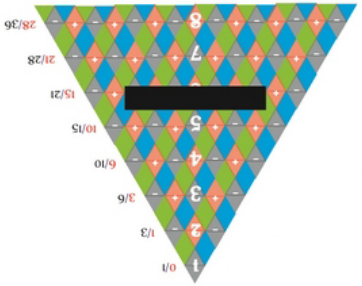
The Electromotive Force

The electromotive force, or most commonly emf (seldom capitalized), or (occasionally) electromotance is "that which tends to cause current (actual electrons and ions) to flow.

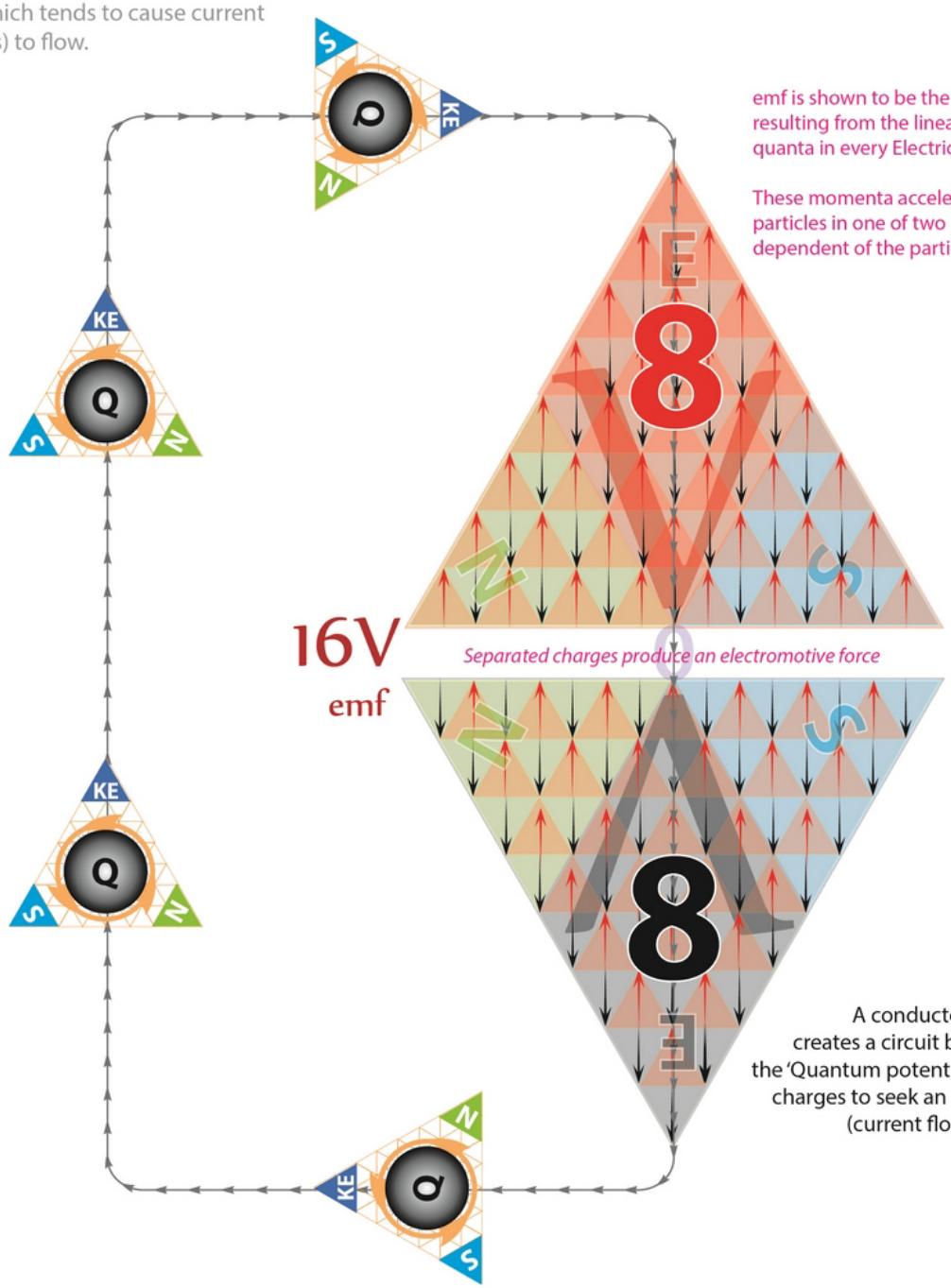
The electromotive Force is the nett force resulting from the separation of electrical charges (potential difference)



Electric Fields contain bidirectional Energy-Momenta



All Charges seek Equilibrium

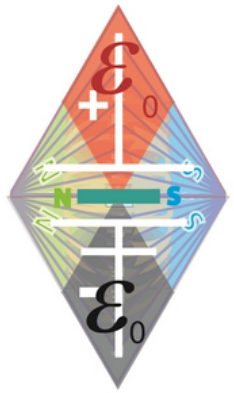


emf is shown to be the nett force resulting from the linear momenta quanta in every Electric 'voltage' field

These momenta accelerate charged particles in one of two directions dependent of the particle's nett charge

A conductor creates a circuit between the 'Quantum potentials' allowing charges to seek an eqilibrium (current flow)

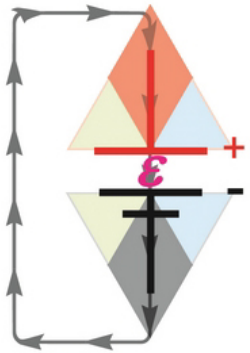
A Magnet stores charge quanta (bosons) in static Electro-Magnetic fields that in turn produce a Magnetic dipole



A Magnet can be viewed as a neuralised Quantum emf source

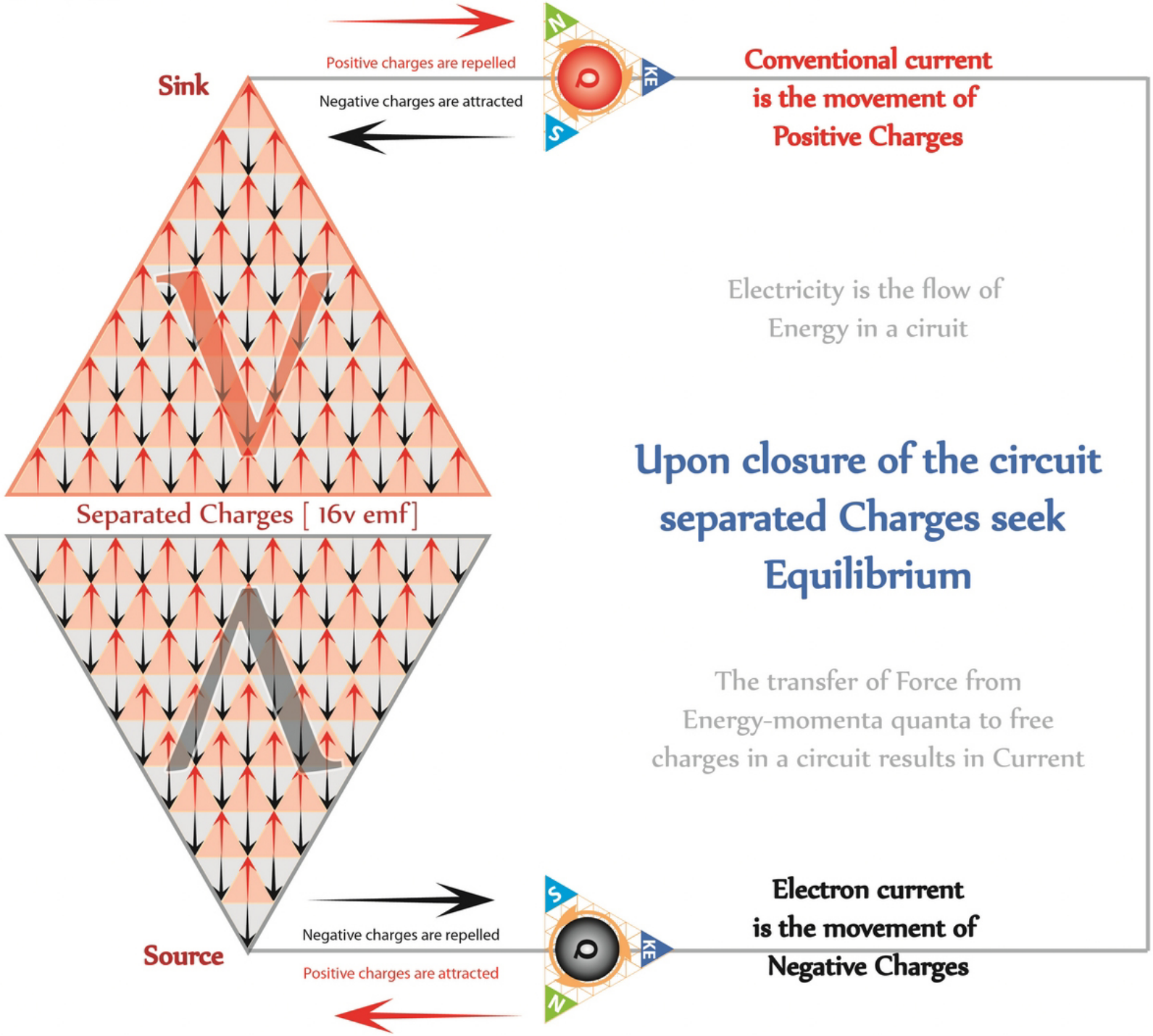
"A source emf can be thought of as a kind of charge pump that acts to move charge from a point of high potential through its interior to a point of opposite potential. …

By chemical, mechanical or other means, the source of emf performs work dW on that charge to move it to the high potential terminal. The emf of the source is defined as the work dW done per charge dq: = dW/dq."



$$\mathcal{E} = -\frac{d\Phi_B}{dt},$$

Sinks and Sources



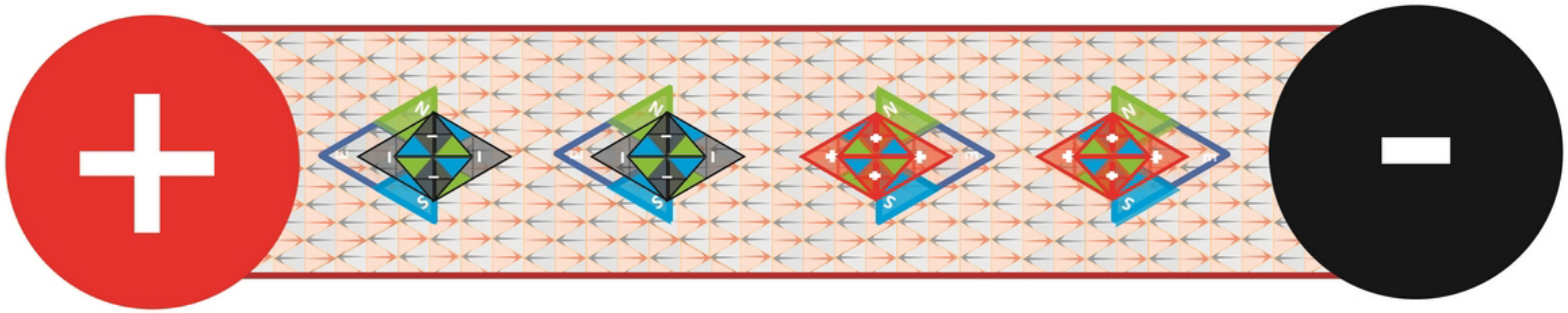
Electricity & KEM Energies

Electron
current flow

Electro-Magnetic energy
can travel through free space or along conductors
and propagates at the 'speed of light' in that medium

Conventional
current flow

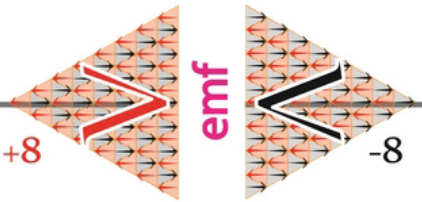
**The 'drfit' velocity of charged bodies is considerably less
than the velocity of Energy propagation in an electrical circuit**



Resistive current flows should be avoided at all costs to facilitate the efficient transfer of energy in circuits

Whenever a current exists,
there MUST be a Magnetic field and
there MUST be Energy present in that field

The Polarised Electric fields induce
motion into charged bodies in an attempt to
equalise the charge imbalances at the emf sources



Power is a measure of the total charge geometry
(electrons) moving past a point along with the energy each
charge geometry (electron) contains (KE expressed as eV)

Electron Volts

The electron volt can also be used as a unit of mass-energy by applying Einstein's relation $E = mc^2$.

For example, the rest Matter of the electron is 496,532 eV (496.532 MeV).

Chemically, for 1 mole of electrons 1 eV ~ 100 kJ mol-1 (96.49 kJ mol-1)

eV

A unit of energy equal to the work required to move one electron through a potential difference of 1 volt.

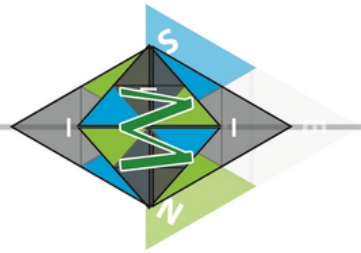
\+ Separated Charges produce electro-motive forces [emf] −

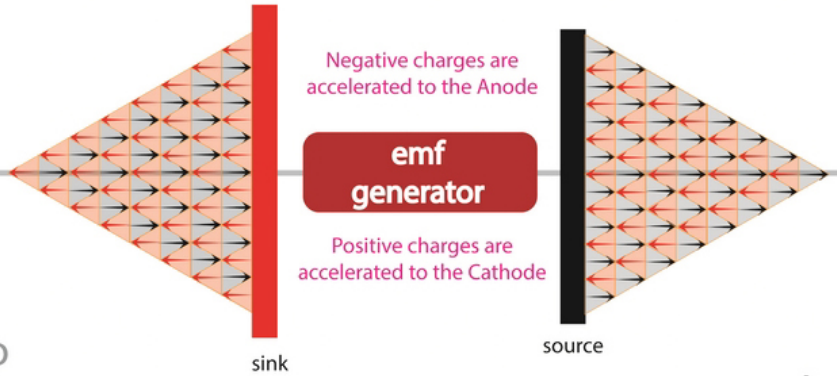
An Electron Volt is also a measure of Electrical Kinetic Energy

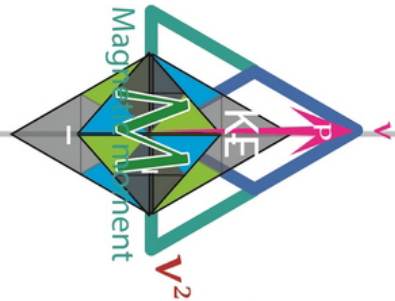
$$\frac{1}{2}\ 4\pi\ \underset{\text{Tetryons}}{}\ \underset{\text{ElectroMagnetic}}{[[\varepsilon_0\mu_0]}.\underset{\text{mass}}{[m}\underset{\text{velocity}}{Av^2}]]$$

(EM Field; Planck quanta)

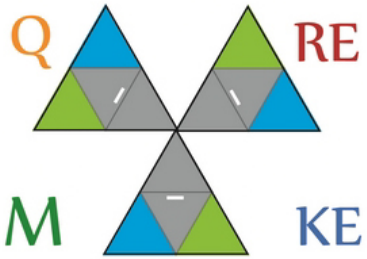
As distinct from Matter's ENERGY Kinetic Energy is 'extended from the Tetryonic geometry of all Matter in motion in a separate 2D KEM field







A Free electron is attracted to Positive anode of an emf source



$$12\pi\ \underset{\text{Fermions}}{}\ \underset{\text{ElectroMagnetic}}{[[\varepsilon_0\mu_0]}.\underset{\text{mass}}{[m}\underset{\text{velocity}}{Av^2}]]$$

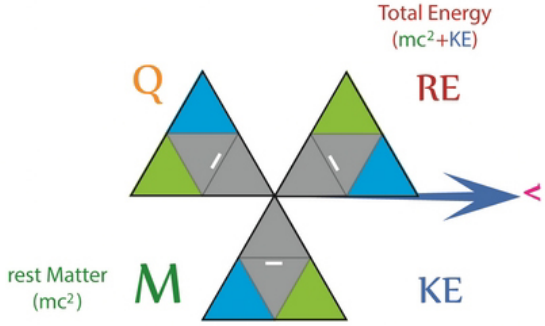
(EM Field; Planck quanta)

The application of UFE to Kinetic energy calculations reveals the underlying processes of the Photo-electric effect and Light-Energy interactions with respect to Kinetic energy

$$\frac{p^2}{2m} = KE = \frac{1}{2}Mv^2$$

By definition, it is equal to the amount of kinetic energy momenta gained by a single unbound electron when it accelerates through an electric potential difference of one volt.

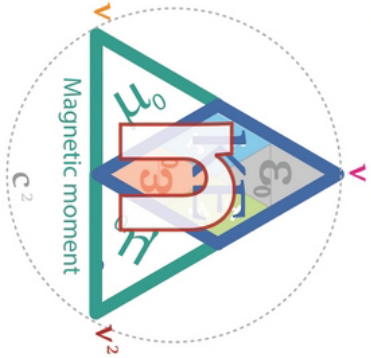
Accelerated electrons have increased KE, Magnetic moments & momentum



(Total Energy = Absolute rest Matter + Kinetic energy) additionally the Lorentz relativistic correction factor (β) presents itself naturally from the UFE when velocity is applied

Electronic Kinetic Energies

have discrete energy levels within the nucleus and
continuous energy levels in unbound electrons



Relativistic KEM formula must
always remove invariant rest Matter PRIOR
to Lorentz correction being applied

$$KEM = RE - mc^2$$

As rest Matters is invariant and the
Lorentz factor applies to EM waves only

$$KEM = 4\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Electric & Magnetic energies
are contained
in the KEM field geometry
extending from all
Matter geometries in motion

Transistions between Quantum
levels provides basis for all
Electron - Photon interactions

$0.211\ eV / n^2$

$$p/h = \tilde{\nu}$$

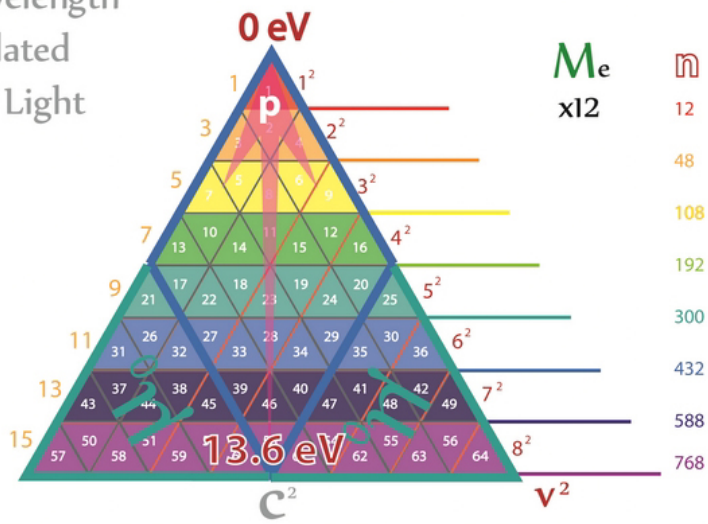
Wave numbers
are the inverse of
Wavelengths

$$h/p = \lambda$$

$$mv^2/h = f$$

Frequency and Wavelength
are inversely related
via the Speed of Light

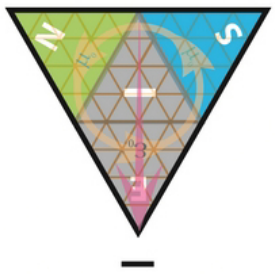
$$\frac{Mv^2}{c^2} = \frac{KEM}{c^2} = \frac{hv^2}{c^2}$$



A changing Electric field produces a changing Magnetic field and vice versa

$$\nabla \times \mathbf{B} = \epsilon_0\mu_0\frac{\partial \mathbf{E}}{\partial t} + \mu_0\mathbf{J},$$

Bosons are transverse energy momenta fields



As opposed to Maxwell's view of a 'stretching ether' that stores energy between the capacitive plates

Equilateral energy momenta is stored compressively in the Inductive quantum fields [ZPF] as it increases, and is released via exchange Bosons

As the quanta of a system increases so does its energy

Producing a quantum field of Magnetic dipoles and Electric fields

$$\mathbf{J}_D = \epsilon_0\frac{\partial \mathbf{E}}{\partial t}$$

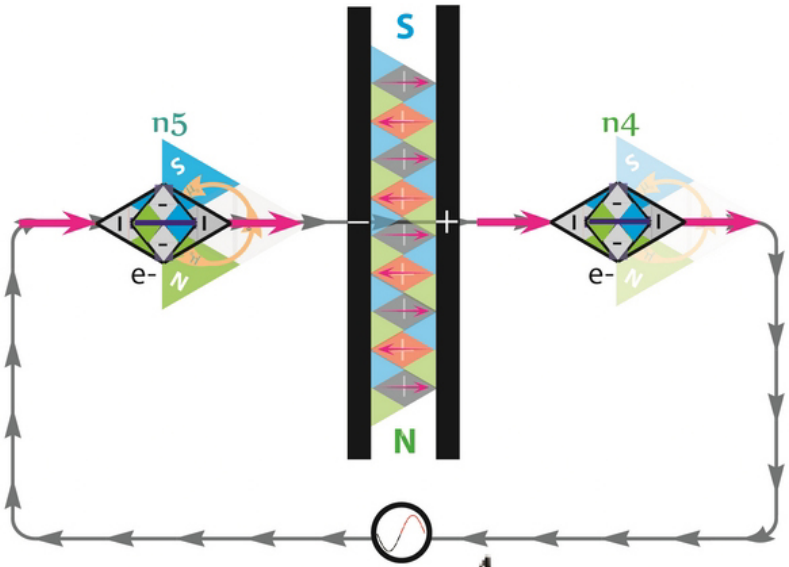
Displacement Current is produced by a Time changing Electric Field

Displacement Current

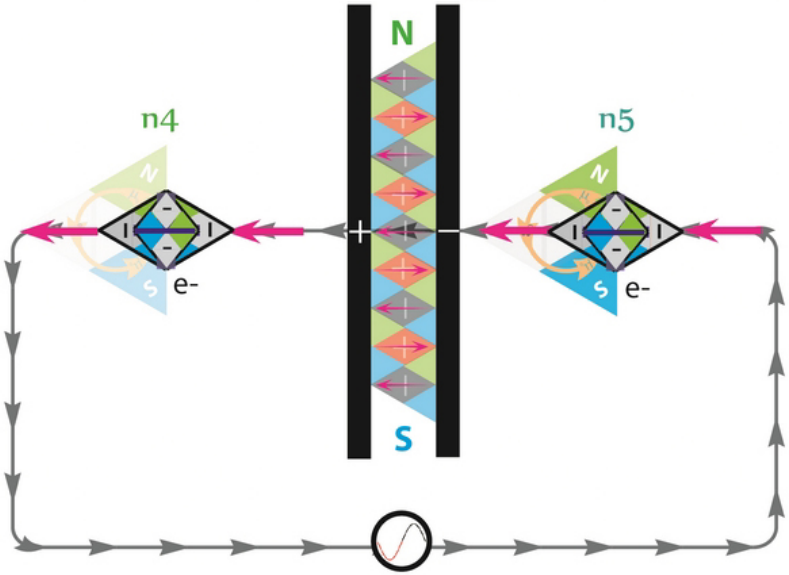
It must be carefully borne in mind that we have made only one step in the theory of the action of the medium. We have supposed it to be in a state of stress, but we have not in any way accounted for this stress, or explained how it is maintained. This step, however, seems to me to be an important one, as it explains, by the action of the consecutive parts of the medium, phenomena which were formerly supposed to be explicable only by direct action at a distance.

Maxwell - On Physical Lines of Force (1861)

Capacitors store Charge between their plates



$$C = \epsilon\frac{A}{d}$$



Capacitors store EM Energy as transverse Bosons

Electromagnetic Induction

All ElectroMagnetic circuits are comprised of quantum inductive fields [ZPFs] and Energies that obey Newton's third law and the conservation of energy

Electromagnetic induction is the production of an electric current across a conductor moving through a magnetic field.
It underlies the operation of generators, transformers, induction motors, electric motors, synchronous motors, and solenoids.

EM field coupling

$$|\mathcal{E}| = \left|\frac{d\Phi_B}{dt}\right|$$

Michael Faraday formulated that electromotive force (EMF) produced around a closed path is proportional to the rate of change of the magnetic flux through any surface bounded by that path.

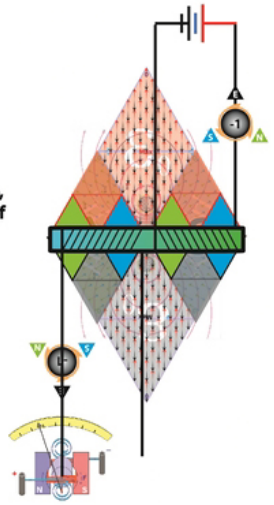
$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$V_\mathrm{p} = N_\mathrm{p}\frac{\mathrm{d}\Phi}{\mathrm{d}t}.$$

For the special case of a coil of wire, or a transformer circuit composed of N loops with the same area, Faraday's general equation becomes

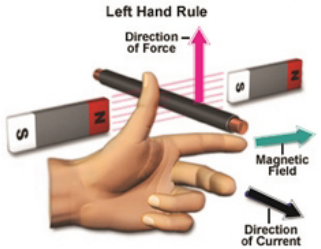
$$V_\mathrm{s} = N_\mathrm{s}\frac{\mathrm{d}\Phi}{\mathrm{d}t},$$

Inductive Coupling

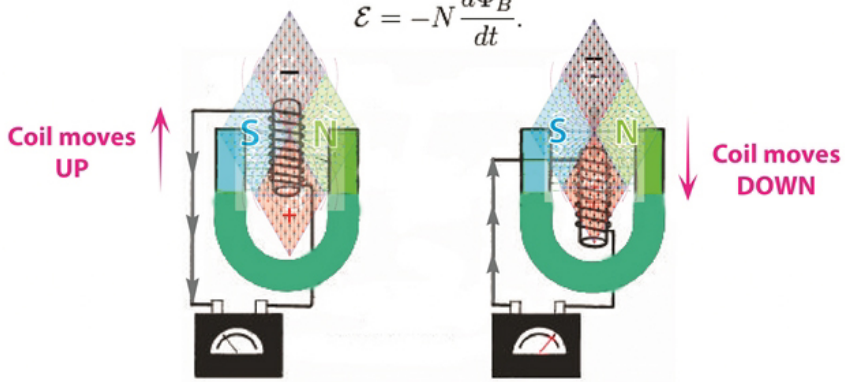


A corollary of Faraday's Law, together with Ampère's law and Ohm's law is Lenz's law: The EMF induced in an electric circuit always acts in such a direction that the current it drives around the circuit opposes the change in magnetic flux which produces the EMF

$$\mathcal{E} = -N\frac{d\Phi_B}{dt}.$$

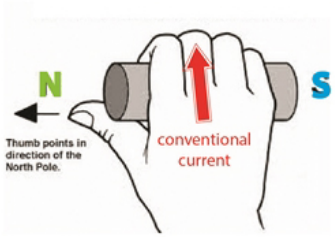


Fleming's left hand rule
(for electric motors)



An electric current passes through a solenoid, resulting in a magnetic field. When you wrap your right hand around the solenoid with your fingers in the direction of the conventional current, your thumb points in the direction of the magnetic north pole.

An electric current passes through a straight wire. Here, the thumb points in the direction of the conventional current (from positive to negative), and the fingers point in the direction of the magnetic lines of flux.



Fleming's right hand rule
(for EM induction)

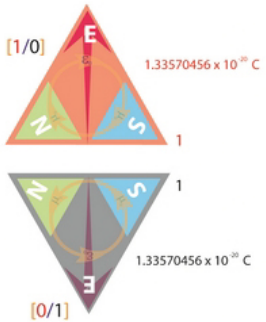
ElectroMotive exchange particles

Bosons

$$1\pi \text{ Charge } \left[\left[\varepsilon_0 \mu_0 \right] . \left[mAv^2 \right] \right]$$

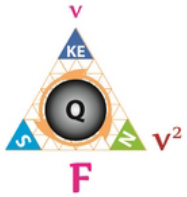
EM Field — Planck quanta — ElectroMagnetic — mass — velocity

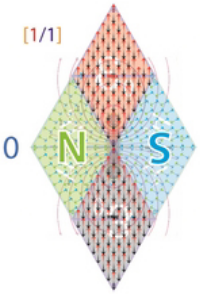
All four of the fundamental forces involve the exchange of one or more EM exchange particles so as to facilitate the transfer of Energy momenta between separated Matter

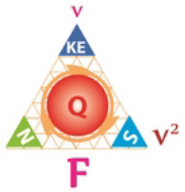


F

In ElectroMagnetic field or circuits, when charges change positions along electric field lines, electrical work is done on them by the electromotive force, whether it involves storing potential energy (negative work) or increasing kinetic energy (positive work)







Photons

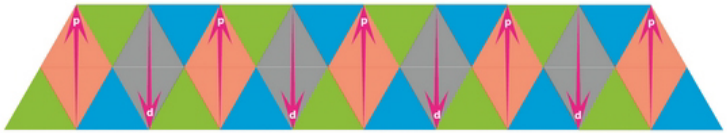
$$2\pi \text{ Photons } \left[\left[\varepsilon_0 \mu_0 \right] . \left[mAv^2 \right] \right]$$

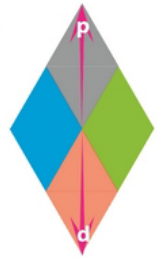
EM Field — Planck quanta — ElectroMagnetic — mass — velocity

The EM exchange force denotes a force produced by the exchange of force carrier particles, such as the electromagnetic force produced by the exchange of photons between electrons

When net positive work is applied to a charge , it gains momentum. The net work on Q1 thereby generates a magnetic field whose strength is proportional to the speed increase of the charged particle.

This magnetic field can interact with a neighboring charge Q2, passing on this momentum to it, and in return, loses momentum.

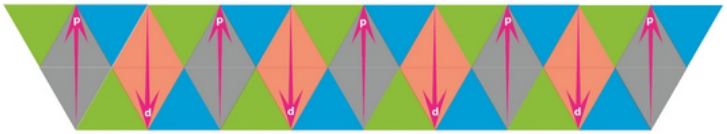




In accordance with Newton's 3rd Law Q2 can also act on Q1 in a similar manner, by which it returns some of the emf that it received from the first moving charge.

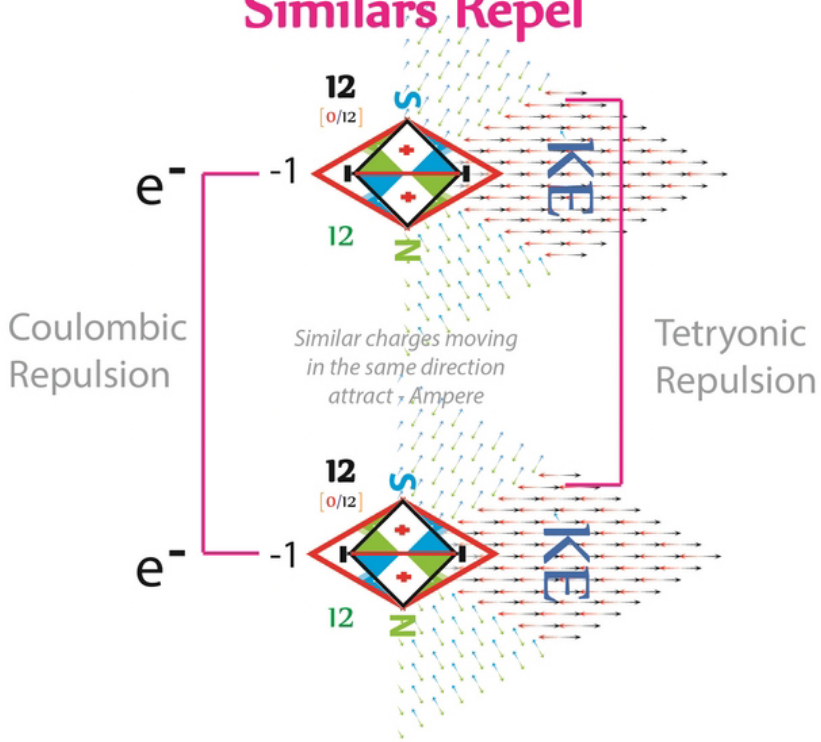
This back-and-forth exchange of EM force quanta [EM charge carriers - Z bosons & Photons] is what constitutes the electromotive inductive force [emf]

The closer that Q1 and Q2 are, the greater the effect.

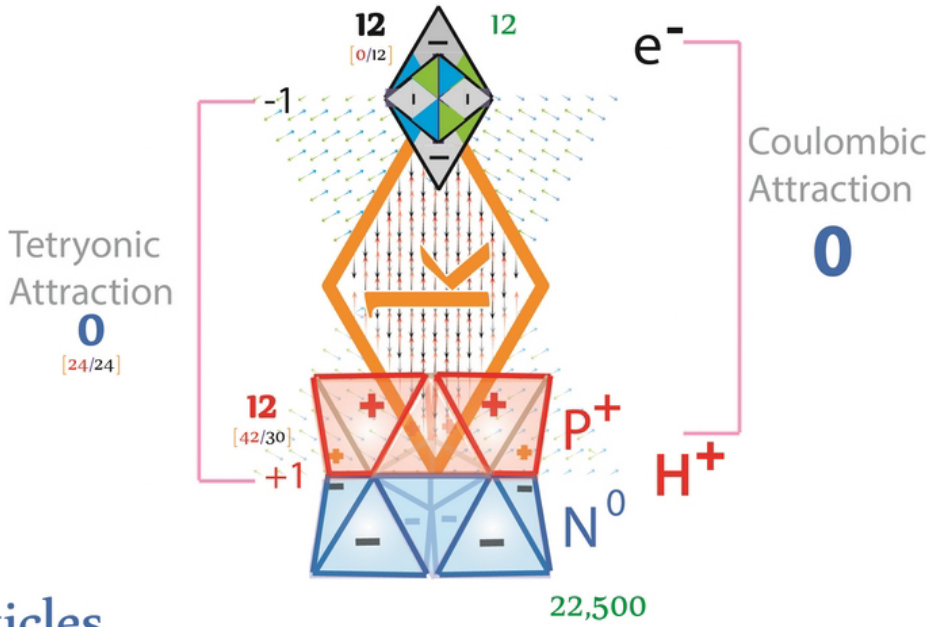


Coulombic vs. Tetryonic Forces

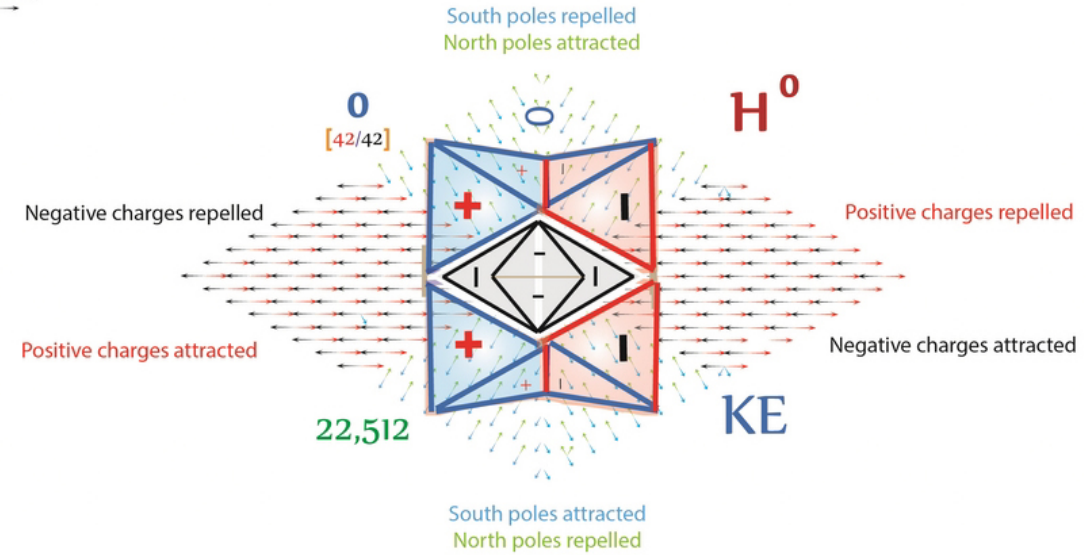
Similars Repel



Opposites Attract



Neutral Particles



KEM fields

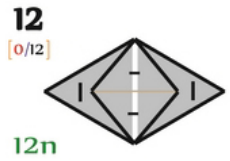
?

Coulombic Forces
are unable to explain
how Neutral particles
are attracted to other particles

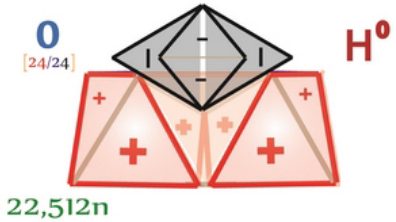
Tetryonic charge geometry

reveals the equilateral mechanics behind
EM induction and all the physical forces

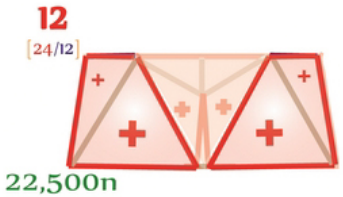
Coulomb's Law



Electron

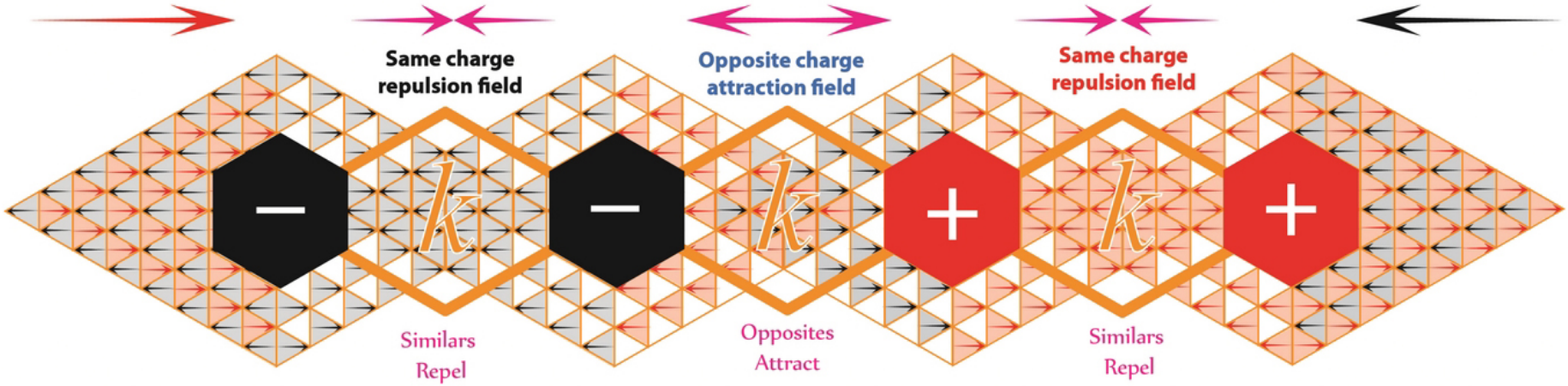


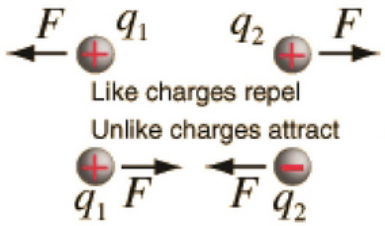
Hydrogen



Proton

The magnitude of the electrostatic force between two point electric charges is directly proportional to the product of the magnitudes of each of the charges and inversely proportional to the square of the distance between the two charges.





$$F = \frac{kq_1q_2}{r^2} = \frac{q_1q_2}{4\pi\varepsilon_0 r^2}$$ *Coulomb's Law*

Interactive forces in a Conductor

$$F = 2k_A \frac{I_1 I_2}{r}$$

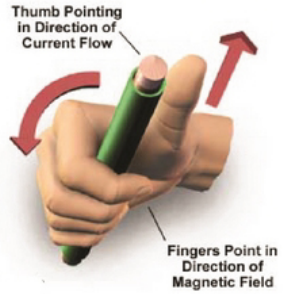
Ampère's force law states that there is an interactive force between two parallel wires carrying an electric current.

$$\mu_0 \overset{\text{def}}{=} 4\pi \text{ e-7 } \frac{N}{A^2}$$

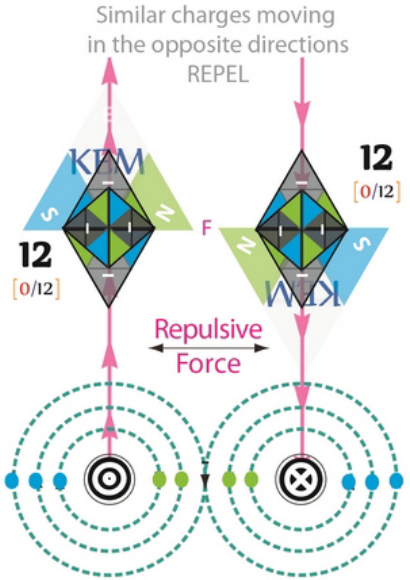
This force is used in the formal definition of the ampere which states that it is "the constant current which will produce an attractive force of 2 × 10–7 newtons per metre of length between two straight, parallel conductors of infinite length and negligible circular cross section placed one metre apart in a vacuum"

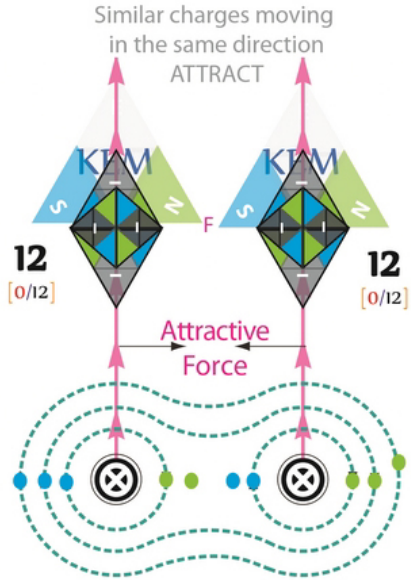
These attractions and repulsions between electric currents differ fundamentally from the effects produced by electricity in repose. First, they cease, as chemical decompositions do, as soon as we break the circuit. Second, in ordinary electric attractions and repulsions, opposite charges attract, and like charges repel; in the attractions and repulsions of electric currents, we have precisely the contrary; it is when the two conducting wires are placed parallel in such a way that their ends of the same sign are next to each other that there is attraction, and there is repulsion when the ends of the same sign are as far apart as possible. Third, in the case of attraction, when it is sufficiently strong to bring the movable conductor into contact with the fixed conductor, they remain attached to one another like two magnets, and do not separate after a while, as happens when two conducting bodies, oppositely electrified, come to touch.

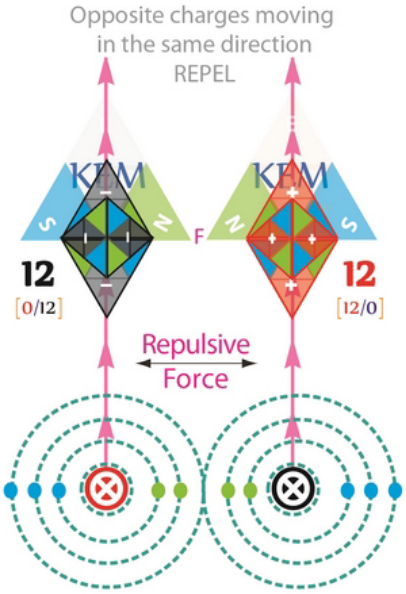
André Marie Ampère (1775 - 1836)

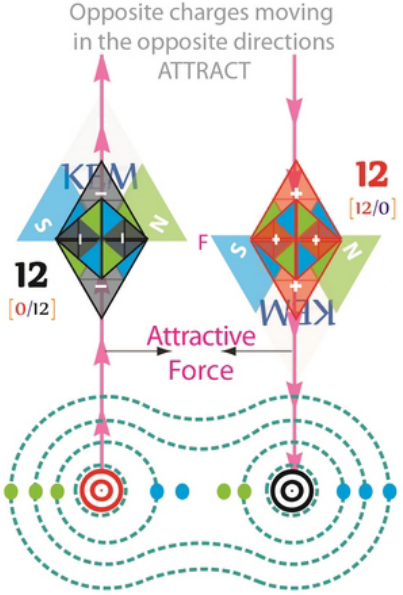


$$1\ \text{A} = 1\frac{\text{C}}{\text{s}}$$

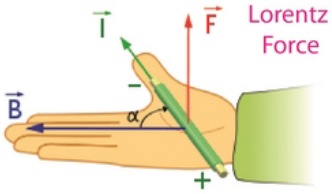








Lorentz Force

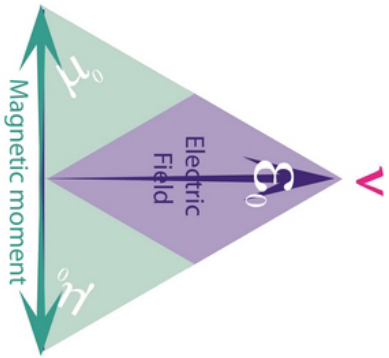


In physics, the Lorentz force is the force on a point charge due to electromagnetic fields.

It is given by the following equation in terms of the electric and magnetic fields

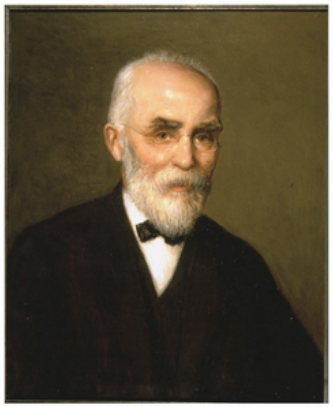
The magnetic force component of the Lorentz force manifests itself as the force that acts on a current-carrying wire in a magnetic field.

In that context, it is also called the Laplace force.



Magnetic fields created by moving charges are perpendicular to the direction of motion (and can do NO work)

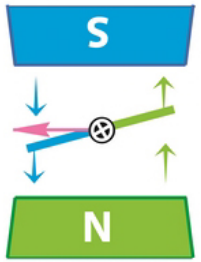
Hendrik Lorentz

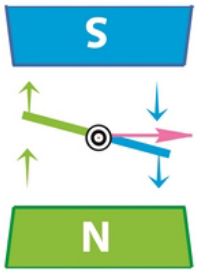


(18 July 1853 – 4 February 1928)

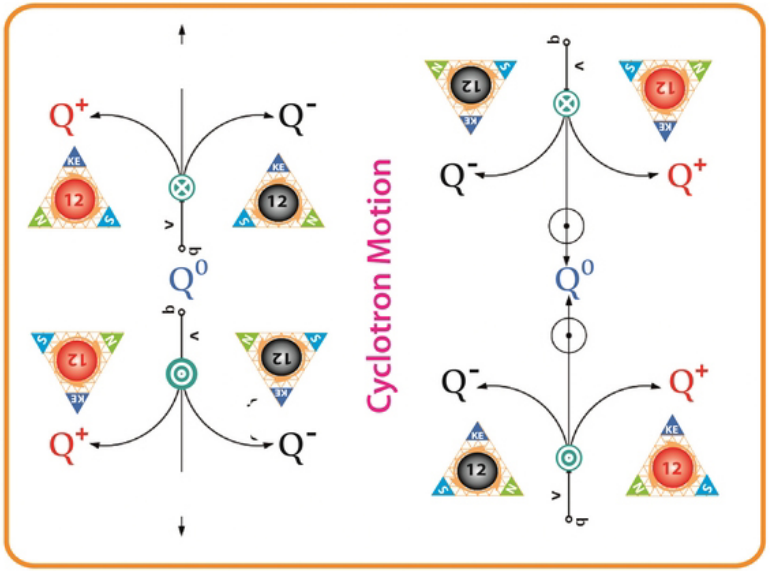
Negative Charges

Q^-



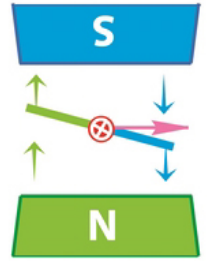


Up out of page ⊙ Magnetic Field ⊗ Down into page

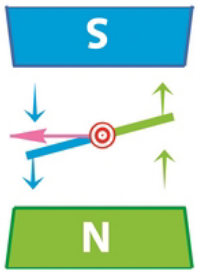


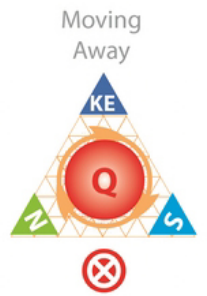
$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

LORENTZ force — *Electric force* — *charge velocity* — *Magnetic force*



Q^+





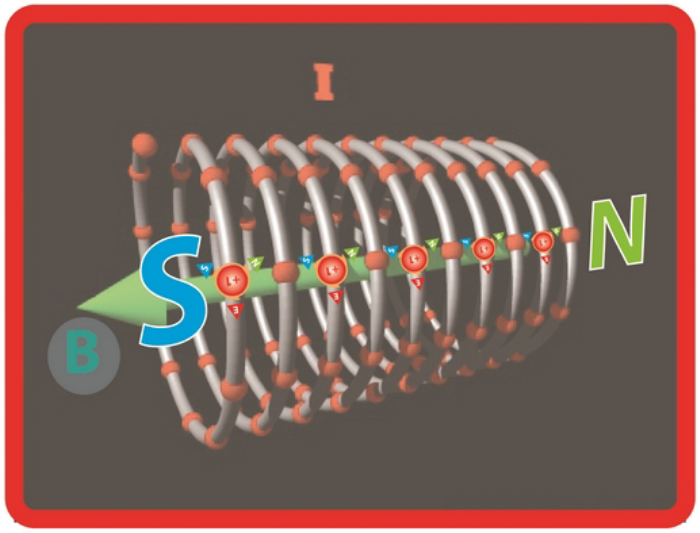
Positive Charges

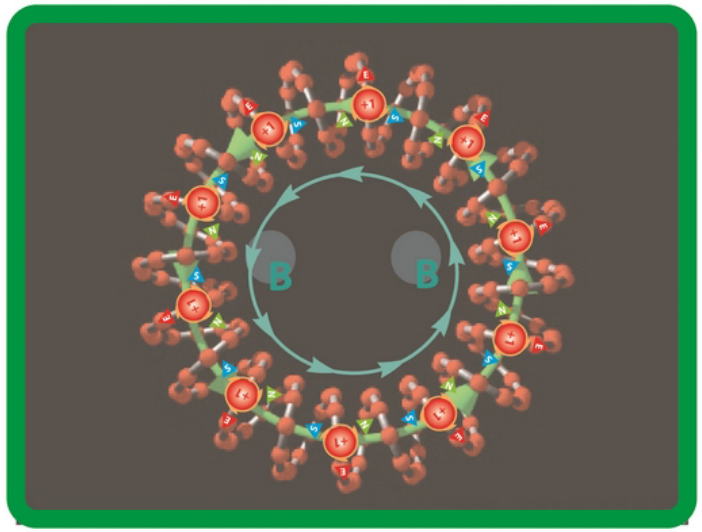
EM Field orientations of particles in Motion

Positive changed quanta traveling anticlockwise
in a Solonoid creates a North South magnetic field
orientated in the direction shown

Negative charged quanta creates a
reverse Dipole field and
reversing the direction of particle motion
also reverses the dipole orientation

Solenoidal Motion

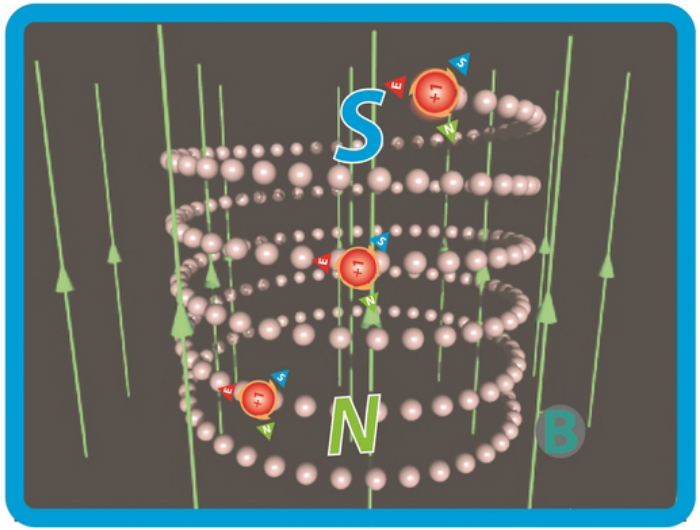




Toroidal Motion

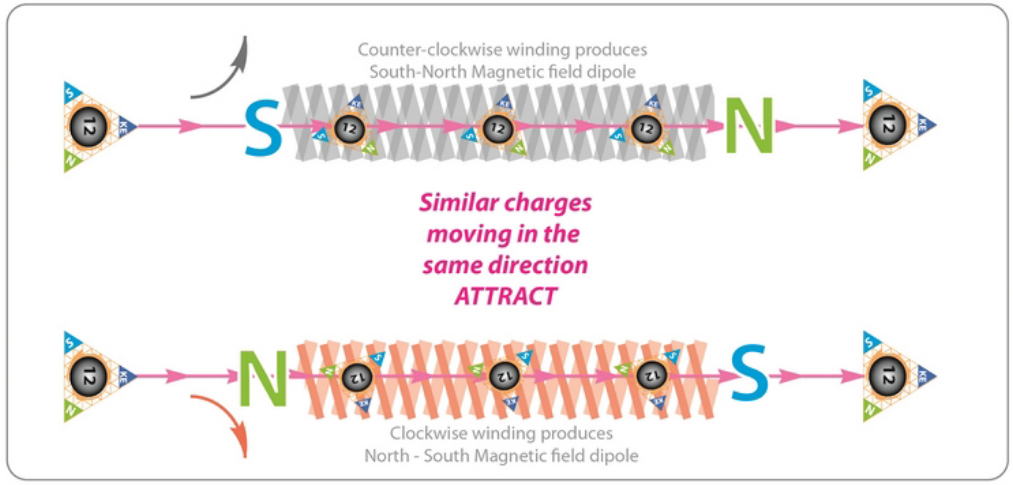
A toroidally wound conductor produces
a Circular Magnetic field

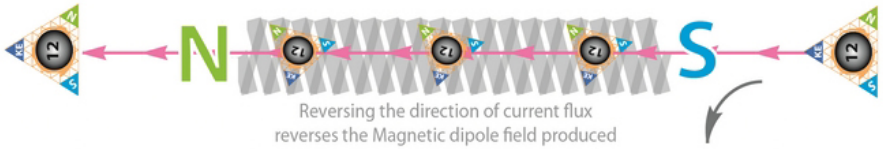
Helical Motion

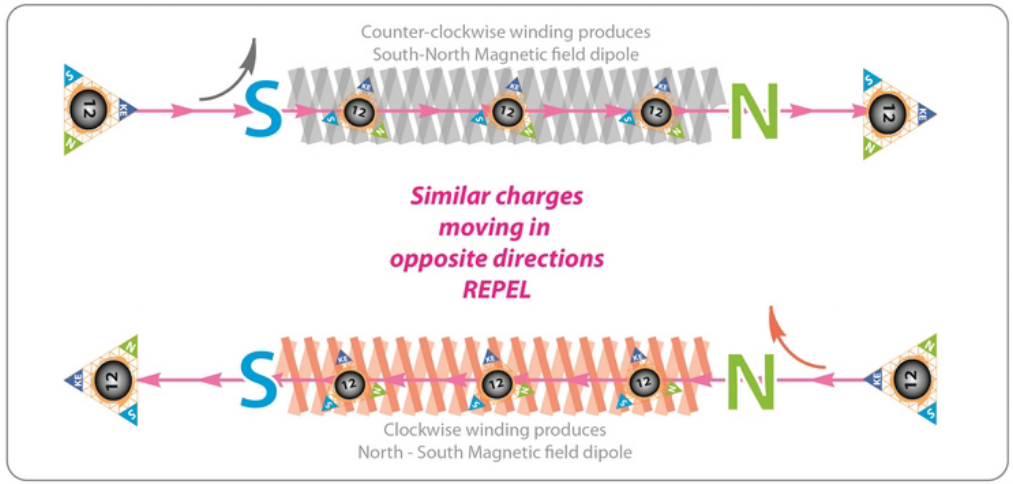


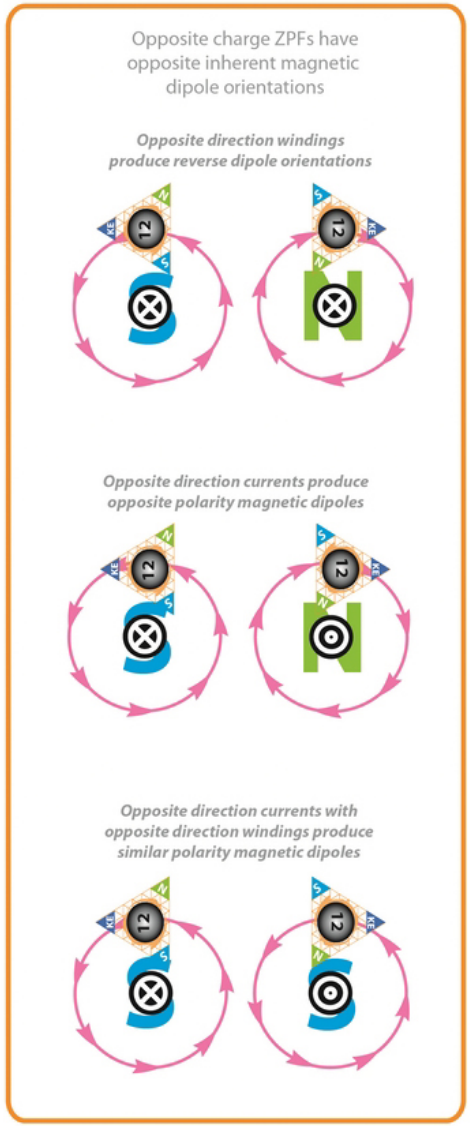
Motion in a Magnetic field

Moving Charges in a Inductive winding





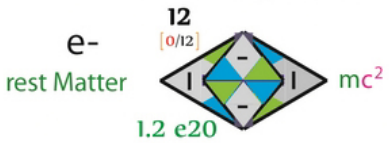




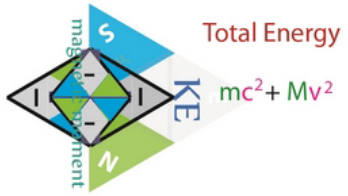
This is best viewed using models

The Skin Effect

Stationary Charged particles have neutralised Magnetic fields



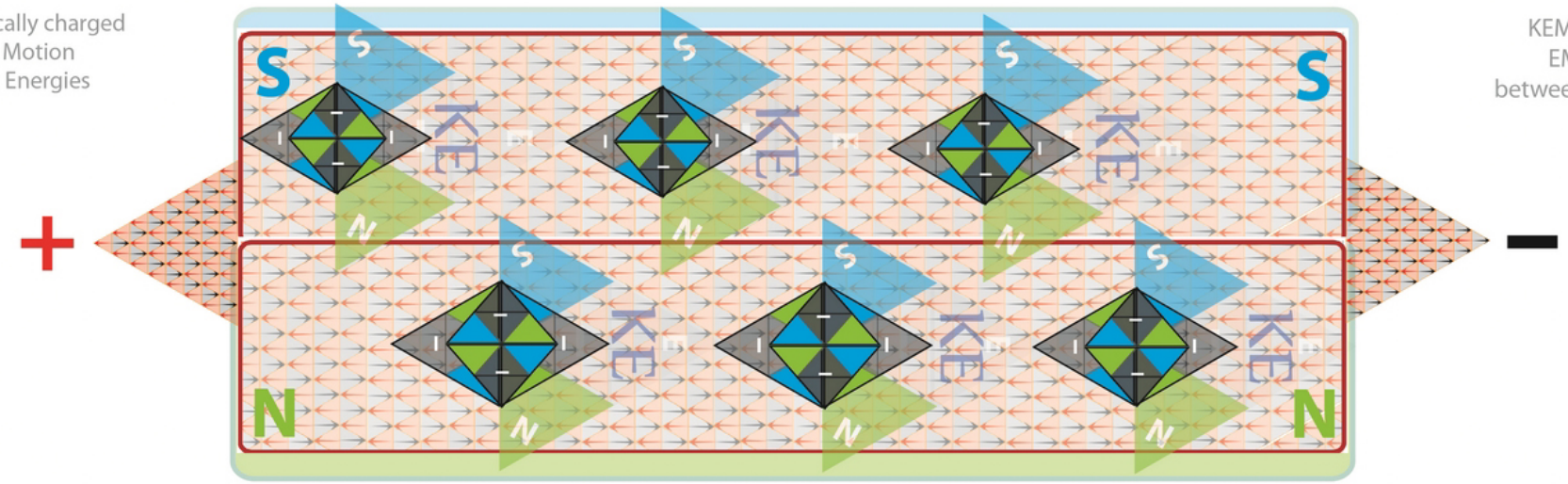
Skin effect is the tendency of an alternating electric current (AC) to distribute itself within a conductor with the current density being largest near the surface of the conductor, decreasing at greater depths



Direct Currents result in co-linear Magnetic fields

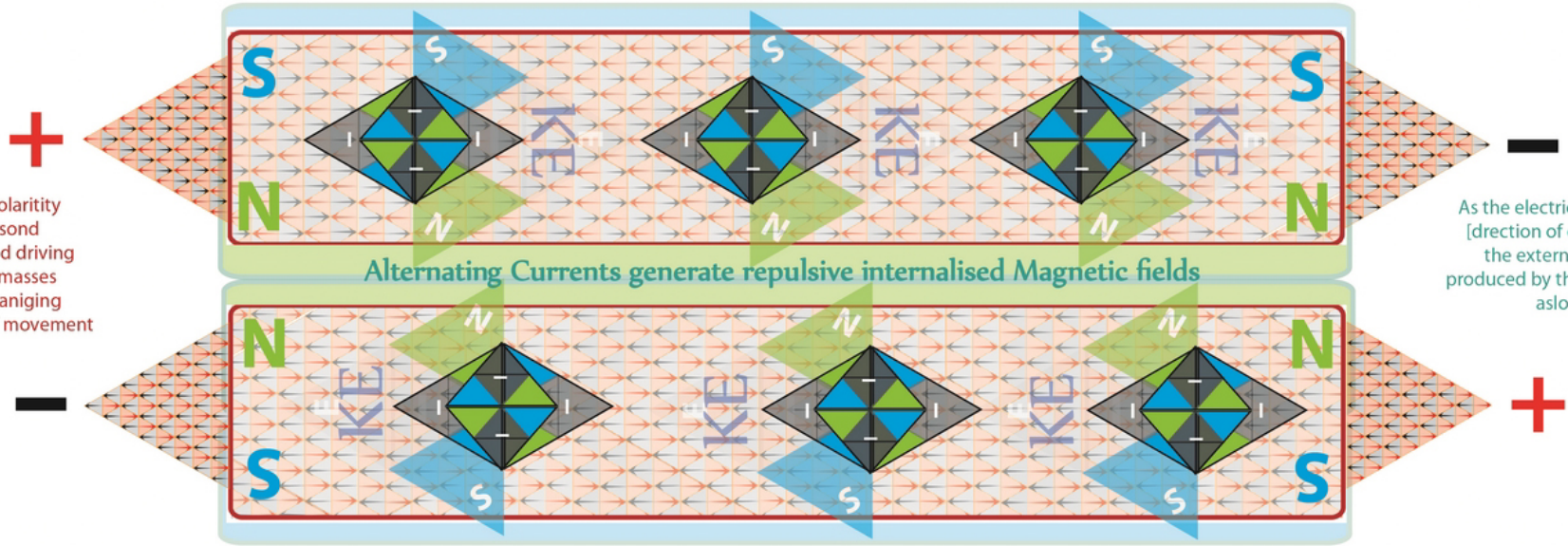
All Electro-statically charged particles in Motion have Kinetic Energies

KEM fields facilitate EM interactions between moving Charges



AMPERE's Law

Co-linear Electric currents result in attractive Magnetic fields



Alternating Currents generate repulsive internalised Magnetic fields

As the emf polarity varies per sond the Electric field driving the charged masses alternates chaniging their direction of movement

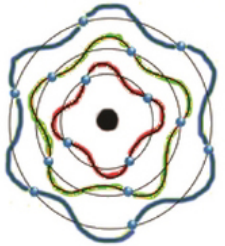
As the electric Current alternates [drection of charge movement] the external Magnetic field produced by the electron KEM fields aslo alternates

deBroglie relationships

$$p = \frac{h}{\lambda} = \frac{h}{2\pi}\frac{2\pi}{\lambda} = \hbar k$$

*" The electron which is moving in a sine wave circular path,
will repeat the same sine wave path in each successive orbit.
The sine wave paths in consecutive orbits will exactly overlap.
The electron wave reconnects with itself and is in phase with itself. "*

$$\lambda = \frac{h}{p}$$



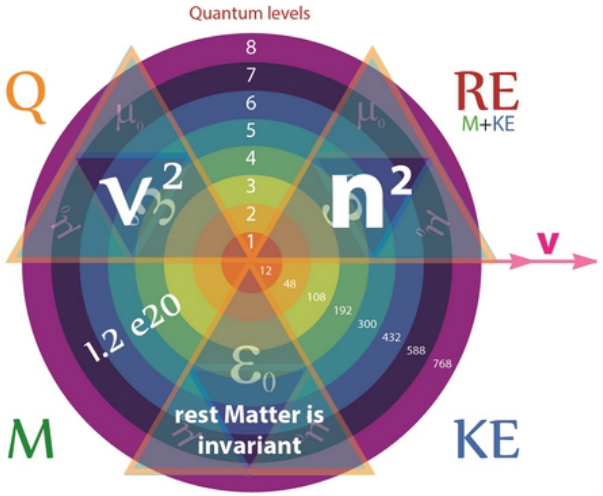
$$f = \frac{E}{h}$$

Louis de Broglie

(15 August 1892 – 19 March 1987)

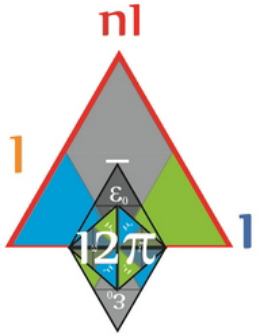
The term Matter -wave only applies to 3D
[Tetryonic]
standing-wave energy geometries

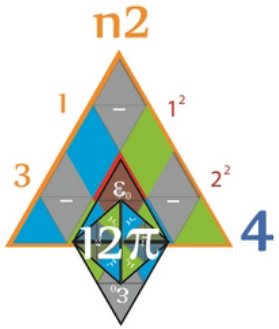
A material object's velocity related kinetic energy and
magnetic moment form a KEM wave geometry



As the Energy quanta content of any EM field increases the wavelength of the EM mass quanta comprising the Kinetic EM [KEM] field decreases

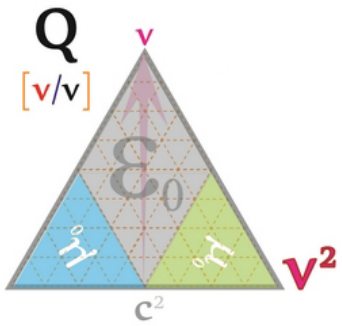
Although Mathematically correct
the illustrative model commonly used to
depict the deBroglie relationships
is incorrect





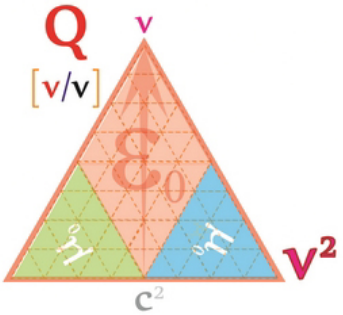
The higher the KEM field energy level the smaller the Quantum wavelength of the KEM field's EM mass

All Matter geometries are velocity invariant, only the EM mass-energy content and quantised angular momentum of their Kinetic EM fields vary



Material EM masses

deBroglie wavelength & Compton frequency



λ

Any increase in Energy quanta results in
a decrease in EM mass quanta wavelengths

v^2

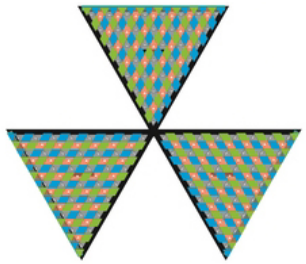
In Matter all energy propagates at c

$$mv^2 = E = hv^2$$

in Standing wave Matter

v=c

Number of Quanta comprising rest Matter

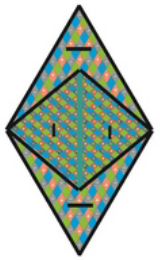


Compton Frequency

$$\frac{mc^2}{h} = 1 \times 10^{19}$$

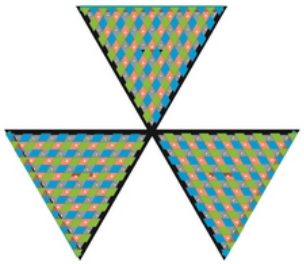
Electron Compton Frequency

$= 1.2 \times 10^{20}$ quanta



v^2

Wavelength of Quanta comprising rest Matter

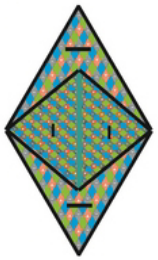


de Broglie wavelength

$$\frac{h}{mc} = 2.99792456 \times 10^{-11}\ m$$

Electron de Broglie wavelength

$= 4.002769142 \times 10^{-11}$ m



λ

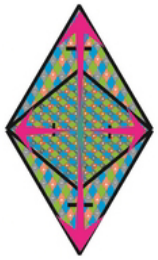
Linear momentum of standing wave Energy comprising Matter

Intrinsic Particle Momenta

$$mc = 2.211340633 \times 10^{-23}\ N.s$$

Intrinsic Electron momenta

$= 2.95253793 \times 10^{-39}$ N.s



p

**The examples above are for stationary Electrons
any motion will NOT affect the results for the electron
(however a extended KEM field will be produced by the motion
and its properties will be affected by changes in velocity)**

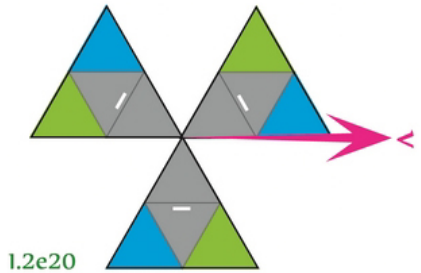
The Compton frequency, deBroglie wavelength
and Energy momenta of any physical system
are all related through the speed of Energy [c]

In Lorentz invariant Matter the standing wave
Energy always propagates at the speed of Light [c]
(with the KEM field being Lorentz variant)

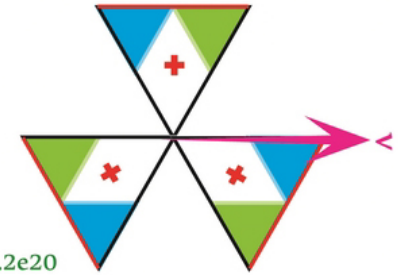
Matter Waves

de Broglie Waves

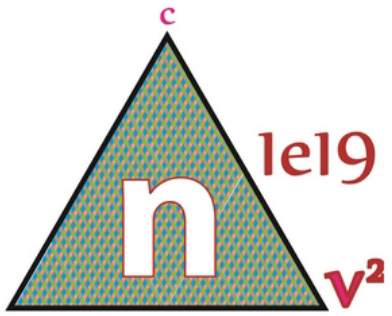
In quantum mechanics, a Matter wave or de Broglie wave
is the quantum-wave (wave–particle duality)
created by the Planck elements constituting Matter



All EM waves and Matter
are made up of Planck quanta
[any imbalance results in Charge]

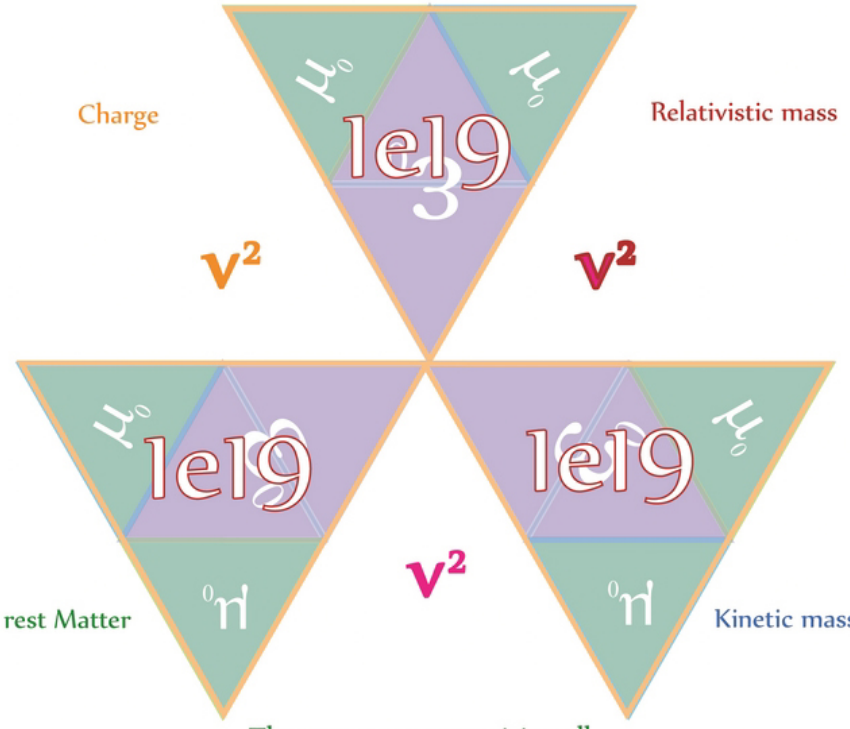


Relativistic mass is the combined total
of both the Kinetic and rest Matter

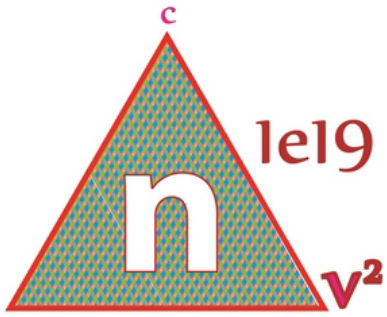


[Compton Frequency]

Charge



Relativistic mass



[Compton Frequency]

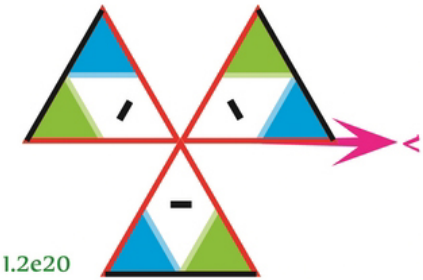
$[mAv^2]$
mass velocity

7.376238376 e-51 kg

rest Matter

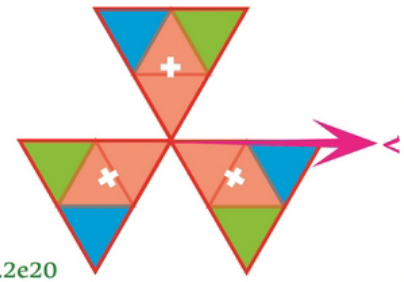
Kinetic mass

6.629432351 e-34 J
Planck quanta
$[mAv^2]$



The rest mass comprising all
Matter Particles is invariant

The Kinetic EM mass-Energies depend on
the velocity of the Matter particle in motion
[in Matter energy travels in a standing wave
at the speed of Light]



Distributions and Uncertainty

No physical theory of local hidden variables can reproduce all of the predictions of quantum mechanics.

John Stewart Bell

(28 June 1928 – 1 October 1990)

All Particles and EM fields are comprised of EM mass-Energy momenta quanta and any attempt to measure the system involves the introduction of additional EM quanta into the systems (Bosons, Photons, Leptons)

A Bell Curve (Normal Distribution) is a mathematical reflection of mass-energy quanta distributions in all Tetryonic [π] geometries

Werner Heisenberg

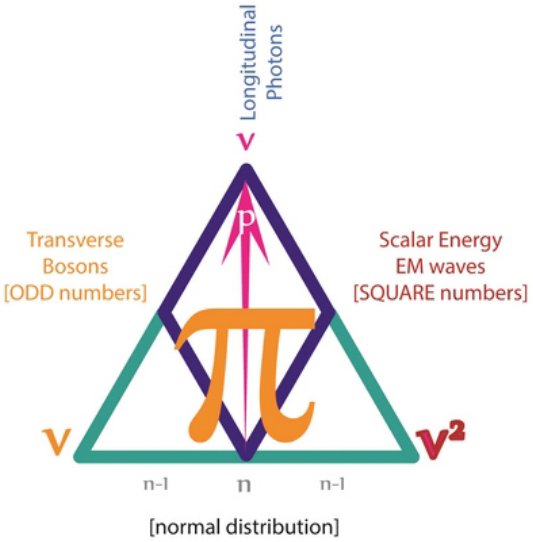
(5 December 1901 – 1 February 1976)

$$\Delta p \, \Delta x \geq \frac{1}{2} \hbar$$

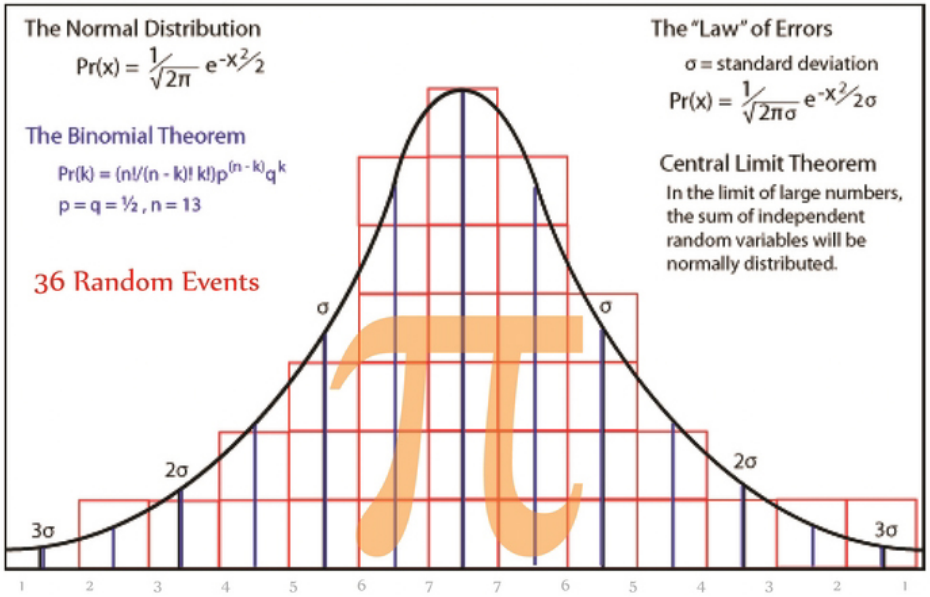
The more precisely the position is determined, the less precisely the momentum is known in this instant, and vice versa.

Heisenberg, uncertainty paper, 1927

$$\Delta E \, \Delta t \geq \frac{1}{2} \hbar$$

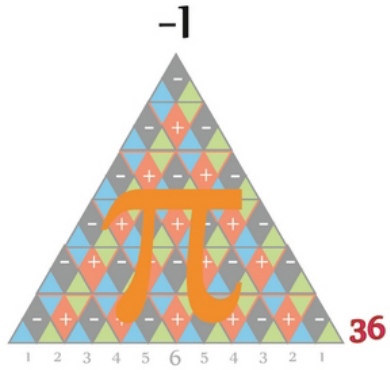


[normal distribution]



Eulers formula

$$e^{i\pi} = -1$$



Leonhard Euler

(15 April 1707 – 18 September 1783)

Chance is closely related to the ideas of uncertainty and indeterminacy.
Uncertainty today is best known from Werner Heisenberg's principle in quantum mechanics.
It states that the exact position and momentum of an atomic particle can only be known within certain limits.
The product of the position error and the momentum error is equal to a multiple of Planck's constant of action.
This irreducible randomness in physical processes established the existence of chance and indeterminism in the world.

Electron Positions in Atomic Orbitals

Werner Heisenberg

(5 December 1901 – 1 February 1976)

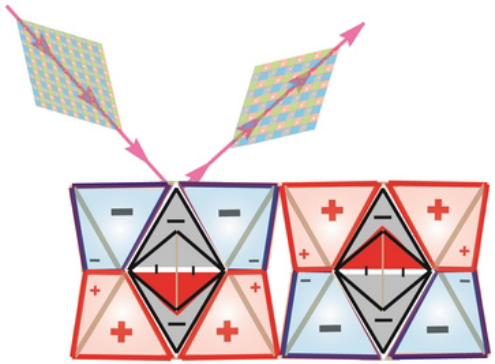
Atomic orbitals are typically described as "hydrogen-like" (meaning one-electron) wave functions over space, categorized by n, l, and m quantum numbers, [as covered in Tetryonic Chemistry] which correspond to the electron's energy, angular momentum, and an angular momentum vector component, respectively

Using Tetryonics as a EM field model, an electron's
position and velocity CAN be modelled simultaneously
(but any attempt to measure or interact with it, will affect its energy levels)

Quantum Mechanics is a statistical mathematical representation
of Tetryonic geometries and EM energy interactions

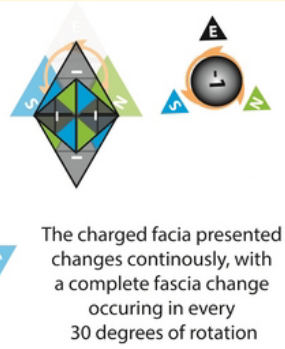
Erwin Schrödinger

(12 August 1887 – 4 January 1961)



**Lepton's are Spin 1 particles
that can easily be misinterpreted
as having different spin numbers
without the correct physical models
to base observations on**

Leptons are
12 loop Quantum
Inductive Rotors

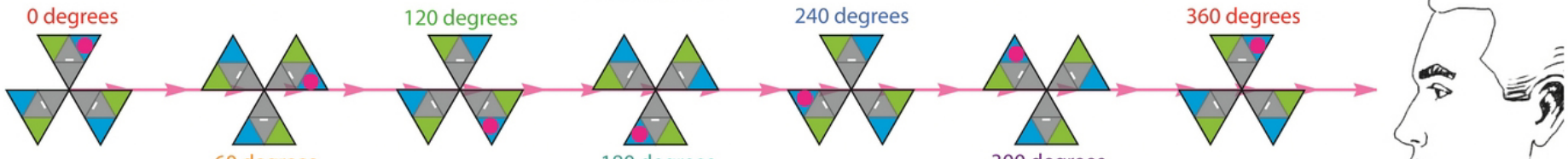


The charged facia presented
changes continously, with
a complete fascia change
occuring in every
30 degrees of rotation

The unique 12 facet geometry
of Leptons results in the same geometry
being presented every 120° rotation of the particle

Leading to the interpretation that
the Lepton disappears and re-appears
when being measured

Making accurate measurement of
its rotational dynamics incorrect
without correct models



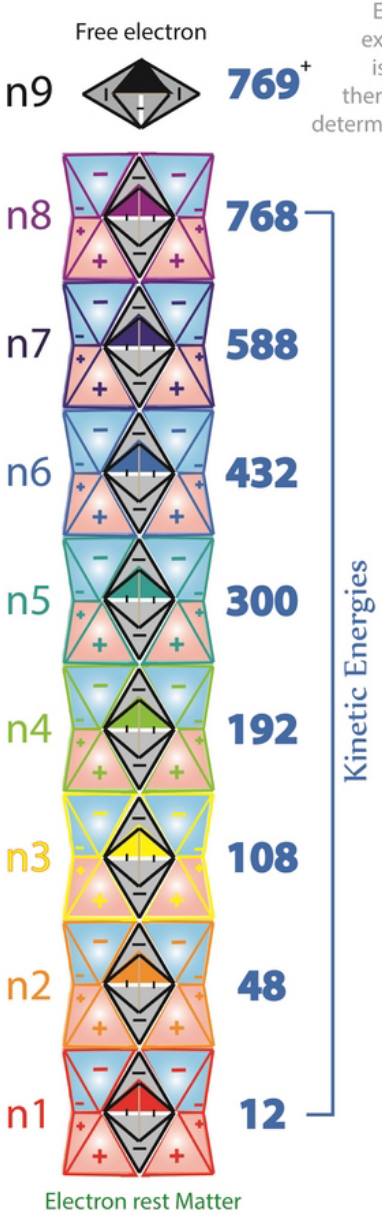
Additionally, every radial arm
of the Lepton geometry is
identical to every other

Including Electric fields and
Magnetic dipole orientations

Tetryonics resolves
these issues with
an accurate 3D model
of Leptons

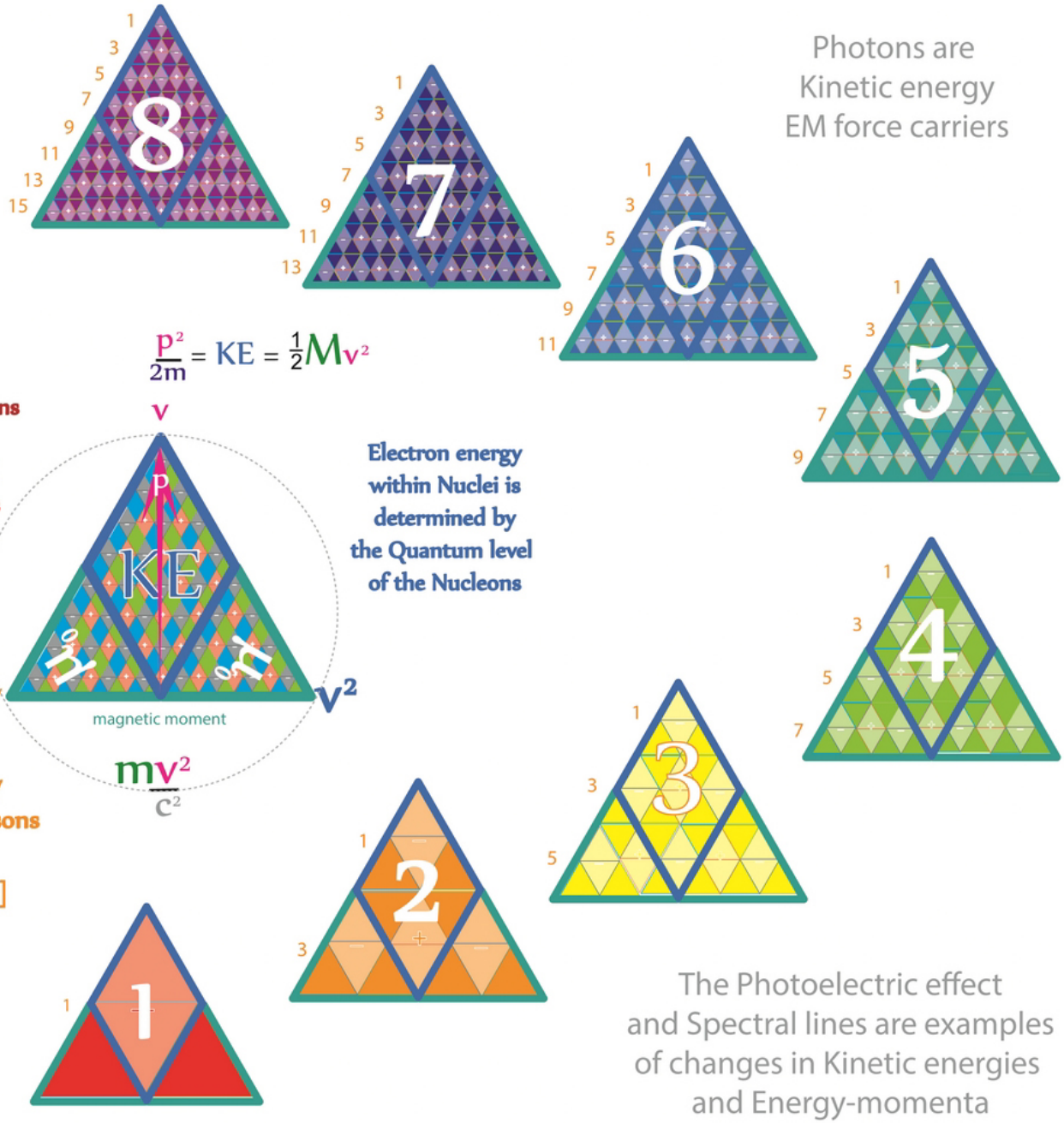
And Quantum Levels
thus providing a solid
foundation for explaining
Electro-Dynamics

KEM Quantum levels



Electron energy external to Nuclei is continuous as there are no Nuclei to determine Electron energies

Photons are Kinetic energy EM force carriers



Quantum levels are the result of Nucleons and Electrons interacting as Quantum Electrical Rotating Convertors

$$\frac{p^2}{2m} = KE = \frac{1}{2}Mv^2$$

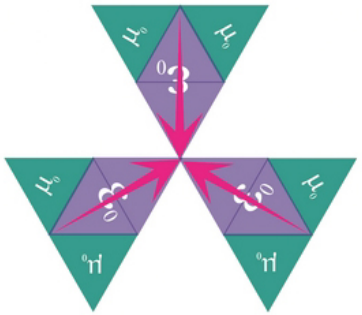
Electron energy within Nuclei is determined by the Quantum level of the Nucleons

EM mass-Energy is exchanged via Bosons [with varying energy momenta]

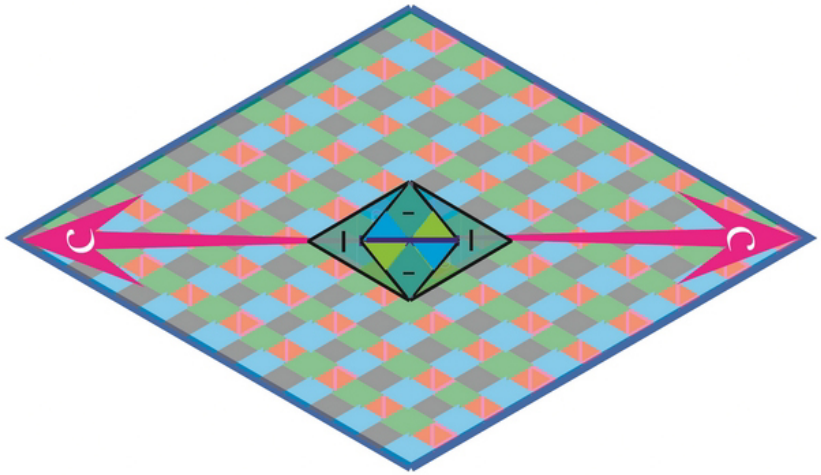
The Photoelectric effect and Spectral lines are examples of changes in Kinetic energies and Energy-momenta

Resonant EM fields

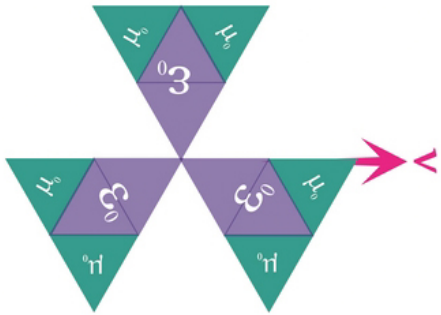
The source of Electron self-Energy



Electron's rest Matter stores EM energy in a Standing wave



All EM waves have v² geometries

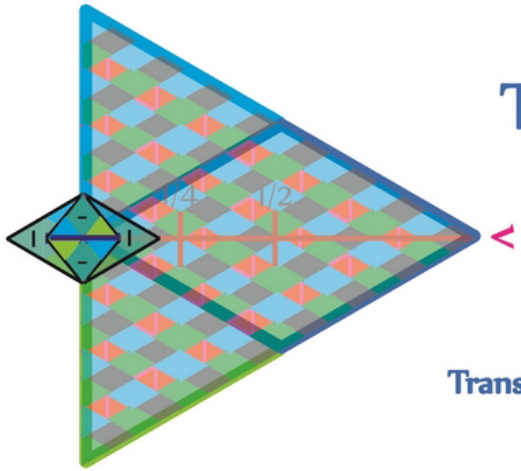


Electrons in motion have KEM Energy fields generated from resonant fields

Historically, the antennas have been physically tuned to match the sought EM wavelength

But if power is applied to a small wavelength standing wave geometry it creates a KEM field that produces a larger virtual antenna field

Tuning KEM waves

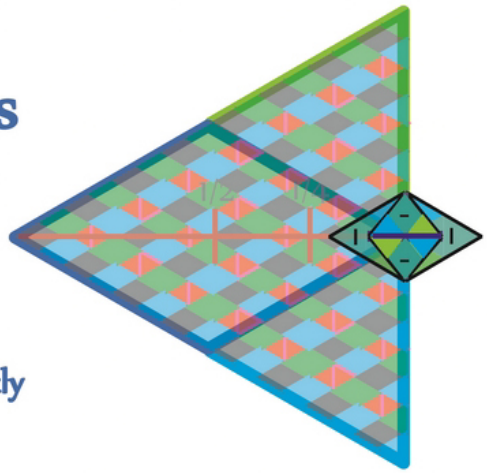


<

1:1

[or other harmonics]

>



Transmitting in order to recieve efficiently

Leptronic Self-energies

a particle's self-energy represents the contribution to the particle's energy,
or effective mass, due to interactions between the particle and the system it is part of.

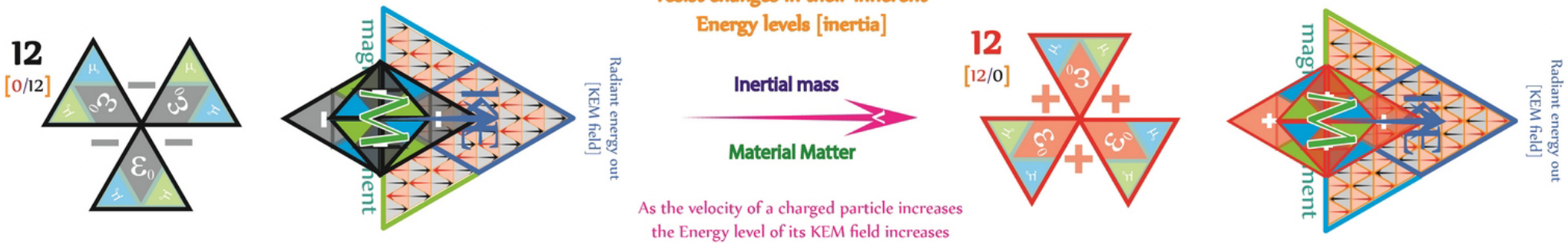
$E = Mc^4$

All Matter contains EM energy propagating in a standing wave geometry at the speed of light (which forms the basis of mass)

The Energy momenta of an electron's KEM field polarises the region surrounding its Matter and creates fields of interaction through the super-positioning of these fields

$KEM = Mv^2$

All Matter geometries are made up of quantum inductive loops which extract Energy from any EM field they move through



As the velocity of a charged particle increases
the Energy level of its KEM field increases
due to increasing Vacuum energy impinging on it

c^4

rest Matter is not affect by changes in velocity [Matter is Lorentz invariant]

$$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

Matter · EM Field · ElectroMagnetic · Planck quanta · mass · velocity

Matter stores energy in its 3D planar facsia as charged masses

additional to creating the familiar laws of interaction
[opposite attract - similars repel]
the KEM fields of leptons can act as tuned antennas
extracting energy from their environment

KEM fields store energy in their 2D planar EM field as neutral divergent masses

c^2

KEM fields generated as a product of Matter in motion are Lorentz variant

$$4\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

KEM field · EM Field · ElectroMagnetic · Planck quanta · mass · velocity

Matter is a probabilistic wave of EM particles

Bosons

All Light is made of
transverse EM energy Quanta

$$1\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[mAv^2 \right] \right]$$

Bosons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Louis de Broglie

Werner Heisenberg

Photons

All Light consists of
longitudinal harmonic oscillators

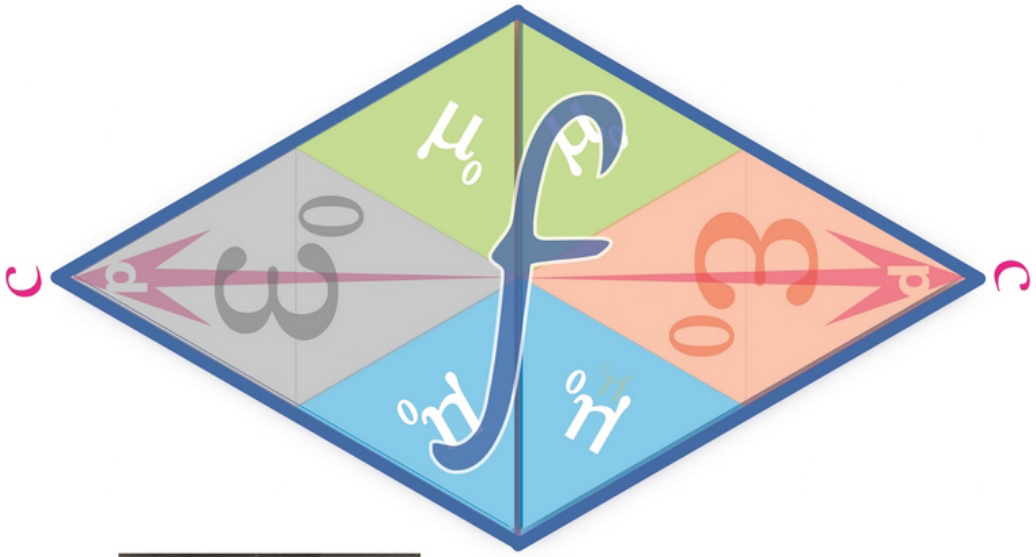
$$2\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[mAv^2 \right] \right]$$

Photons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

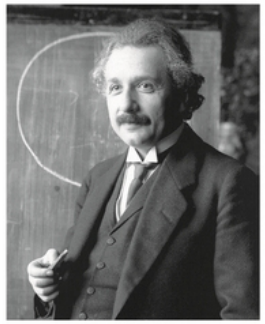
Light is quantised

Max Planck

$$E = nhv$$



Photons are particles

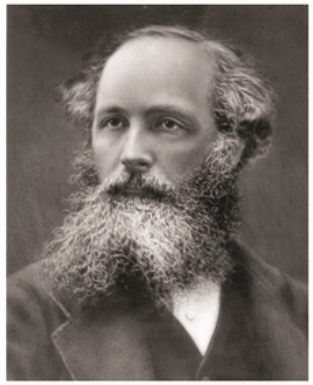


Albert Einstein

$$E = hf$$

All Photons have
mass-Energy and Momentum

$$\lambda = \frac{h}{p} = \frac{h}{mv}\sqrt{1 - \frac{v^2}{c^2}}$$



James Clerk Maxwell

$$\nabla \cdot \mathbf{D} = 4\pi\rho$$

$$\nabla \times \mathbf{H} = \frac{4\pi}{c}\mathbf{J} + \frac{1}{c}\frac{\partial \mathbf{D}}{\partial t}$$

$$\nabla \times \mathbf{E} + \frac{1}{c}\frac{\partial \mathbf{B}}{\partial t} = 0$$

$$\nabla \cdot \mathbf{B} = 0$$

All EM waves and Matter
exhibit a
Wave-Particle duality

$$i\hbar\frac{\partial}{\partial t}\Psi = \hat{H}\Psi$$

Transverse EM waveforms propagate at c

Bosons in a EM wave

EM waves are comprised of transverse W Bosons

Odd numbers totaling to a Square number

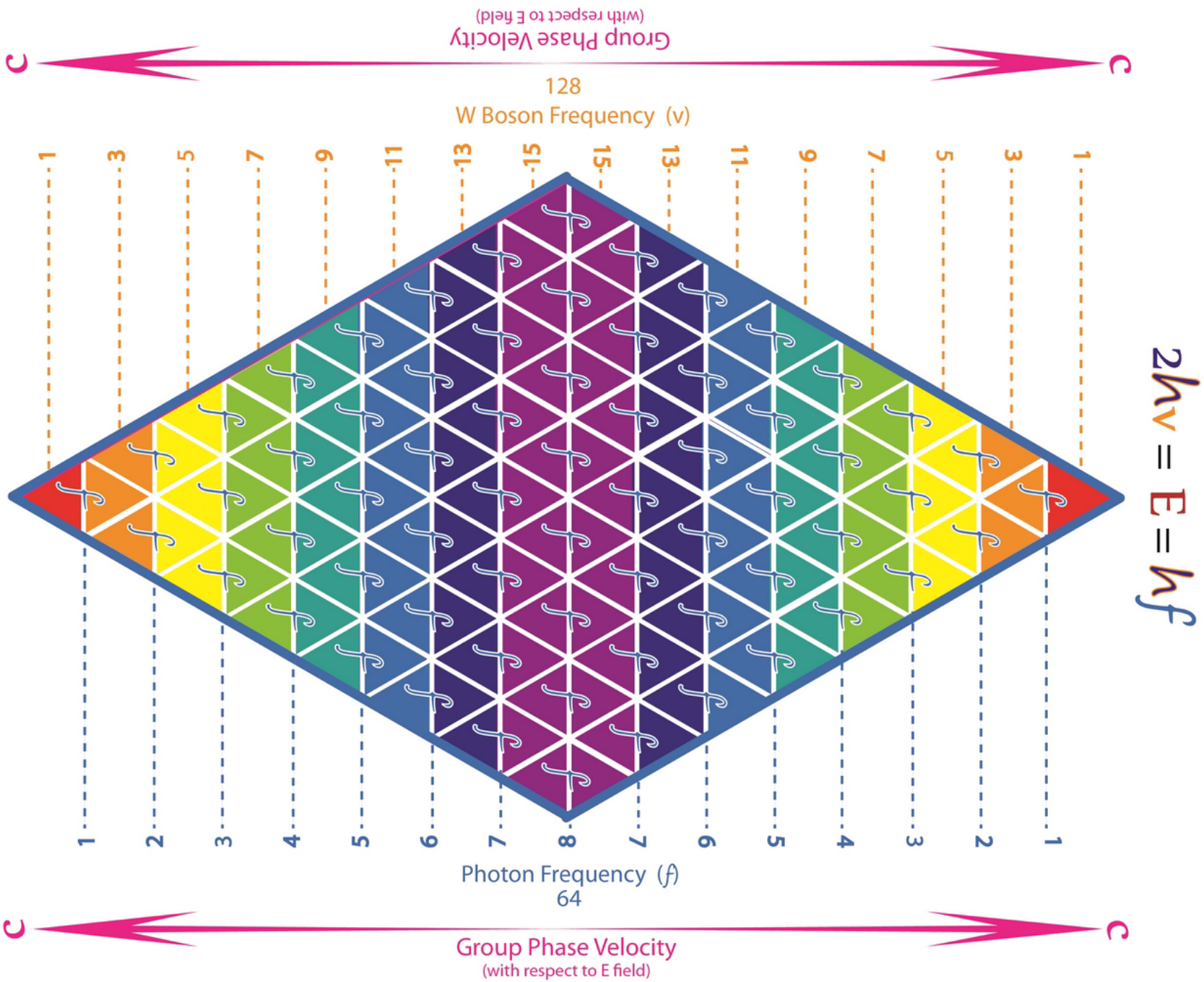
$E = h\nu$

$2\nu = f$

$E = hf$

Even numbers totaling to a Square number

EM waves are comprised of longitudinal Photons



[Bosons]
ODD π
(1,3,5,7,9, ...)

Z BOSONS are comprised of 1/2 wavelength quantum levels

$E = h\nu$

vs.

1:1

PHOTONS are comprised of integer wavelength frequencies

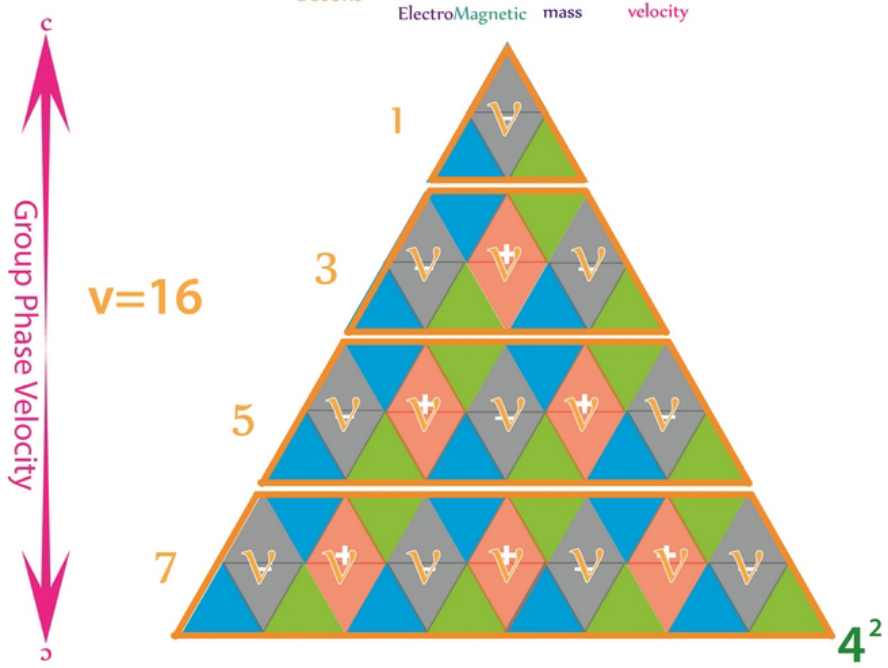
$E = hf$

[Photons]
EVEN π
(2,4,6,8,10, ...)

ZPFs are Boson quantums

$$\underset{\text{Bosons}}{\text{ODD}\pi}\left[\left[\varepsilon_0\mu_0\right].\left[m\mathbb{A}v^2\right]\right]$$

EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\mathbb{A}v^2$ (mass, velocity)



$$\underset{\text{Matter}}{4n\pi}\left[\left[\varepsilon_0\mu_0\right].\left[m\mathbb{A}v^2\right]\right]$$

EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\mathbb{A}v^2$ (mass, velocity)

Matter is comprised of transverse Bosons

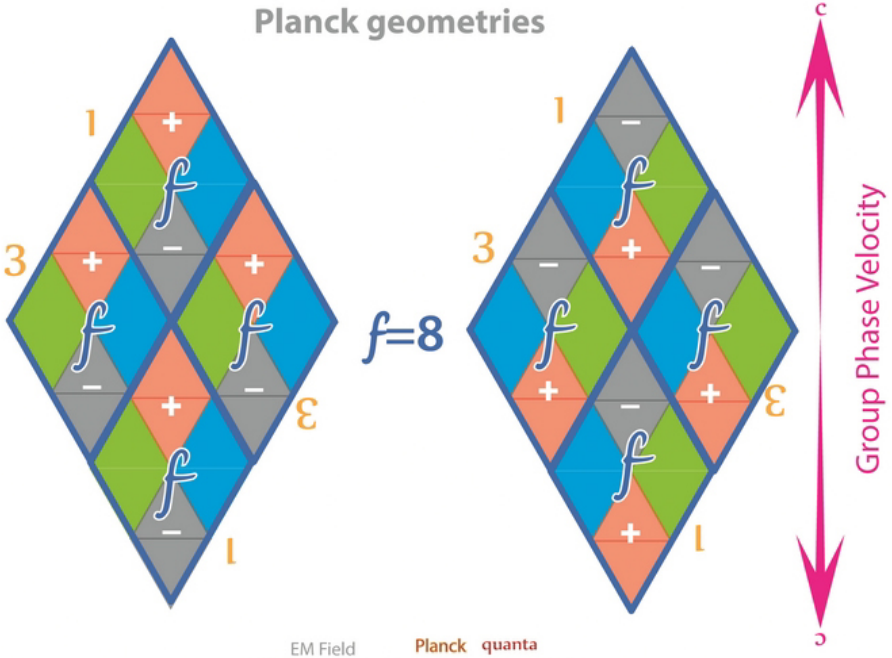
Bosons and Photons have differing EM geometries

Photons are comprised of Bosons

$$\underset{\text{Photons}}{2\pi}\left[\left[\varepsilon_0\mu_0\right].\left[m\mathbb{A}v^2\right]\right]$$

EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\mathbb{A}v^2$ (mass, velocity)

Photons are EVEN number Planck geometries



$$\underset{\text{EM waves}}{\text{EVEN}\pi}\left[\left[\varepsilon_0\mu_0\right].\left[m\mathbb{A}v^2\right]\right]$$

EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\mathbb{A}v^2$ (mass, velocity)

EM waves are comprised of longitudinal Photons

Photons and Charge bosons

Bosons are transverse Charge carriers
they combine to create ElectroMagnetic
Photons which are longitudinal charge carriers

Photons are made of
neutral charge quanta

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[m_{\text{mass}}A_{\text{Planck quanta}}v^2_{\text{velocity}}\right]\right]$$

(EM Field)

Their Electric and Magnetic
fields are perpendicular to each other

They propagate in free space
at c along their Electric fields

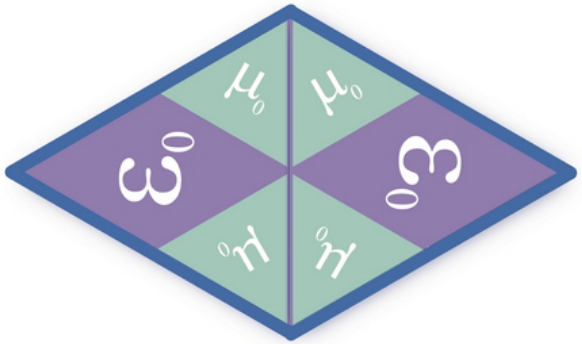
$$\text{EVEN}\,\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[m_{\text{mass}}A_{\text{Planck quanta}}v^2_{\text{velocity}}\right]\right]$$

(EM Field)

EM waves are constituted
by numerous photons
of the same wavelength
(save when superpositioned - White light)

Photons are
Dual Bosons

$$E = 2h\nu$$



$$E = hf$$

A moving charge creates a magnetic field throughout space
that is perpendicular to the direction of motion.

Photons require NO ether to propagate
they are discrete bundles of transverse EM energy-momenta

Similarly, a magnet has an intrinsic neutral electric field
that is perpendicular to its Magnetic Dipole.

James Clerk Maxwell

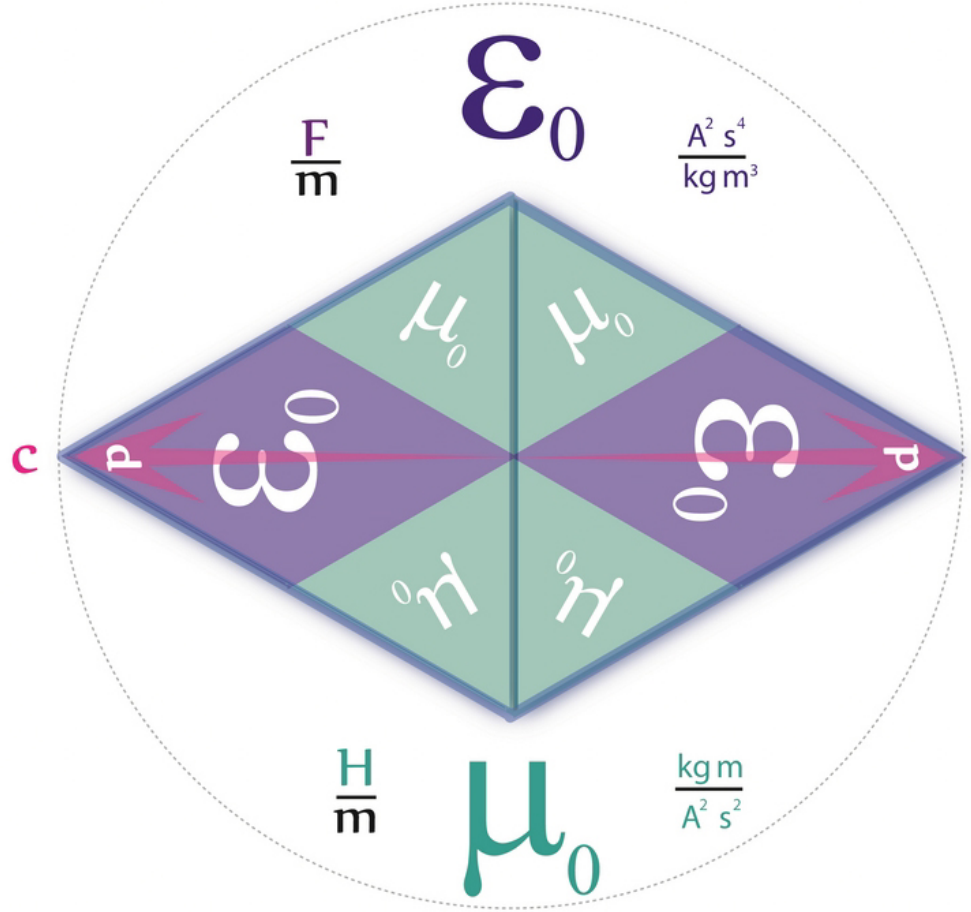
(13 June 1831 – 5 November 1879)

Photonic EM fields

In 1865, James Clerk Maxwell's prediction that light was an electromagnetic wave, which was confirmed experimentally in 1888 by Heinrich Hertz's detection of radio waves, seemed to be the final blow to particle models of light.

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[mAv^2\right]_{\substack{\text{mass}\\ \text{velocity}}}\right]_{\substack{\text{EM Field}\\ \text{Planck quanta}}}$$

$$8.8541e\text{-}12$$



$$E = \frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}$$

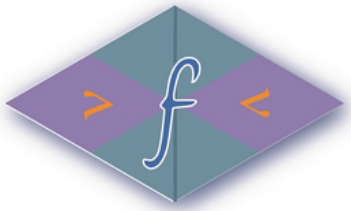
The strength of Electric fields is determined by the Electrical Permittivity Constant

$$\varepsilon_0\mu_0 = \frac{1}{c^2}$$

The strength of Magnetic fields is determined by the Magnetic Permeability Constant

$$B = \mu_0 H$$

ALL
EM mass-ENERGY
waveforms
propagate at c



The speed of light can be calculated using permittivity of free space

$$\frac{K_E}{K_M} = 9e16\ \frac{\frac{N\,m^2}{C^2}}{\frac{N\,s^2}{C^2}}$$

$$c^2 = 9e16\ \frac{m^2}{s^2}$$

$$c = 299{,}792{,}458\ \frac{m}{s}$$

Photons

ElectroMagnetic Field geometry

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[m_{\text{mass}}A_{\text{velocity}}v^2\right]\right]$$ (EM Field; Planck quanta)

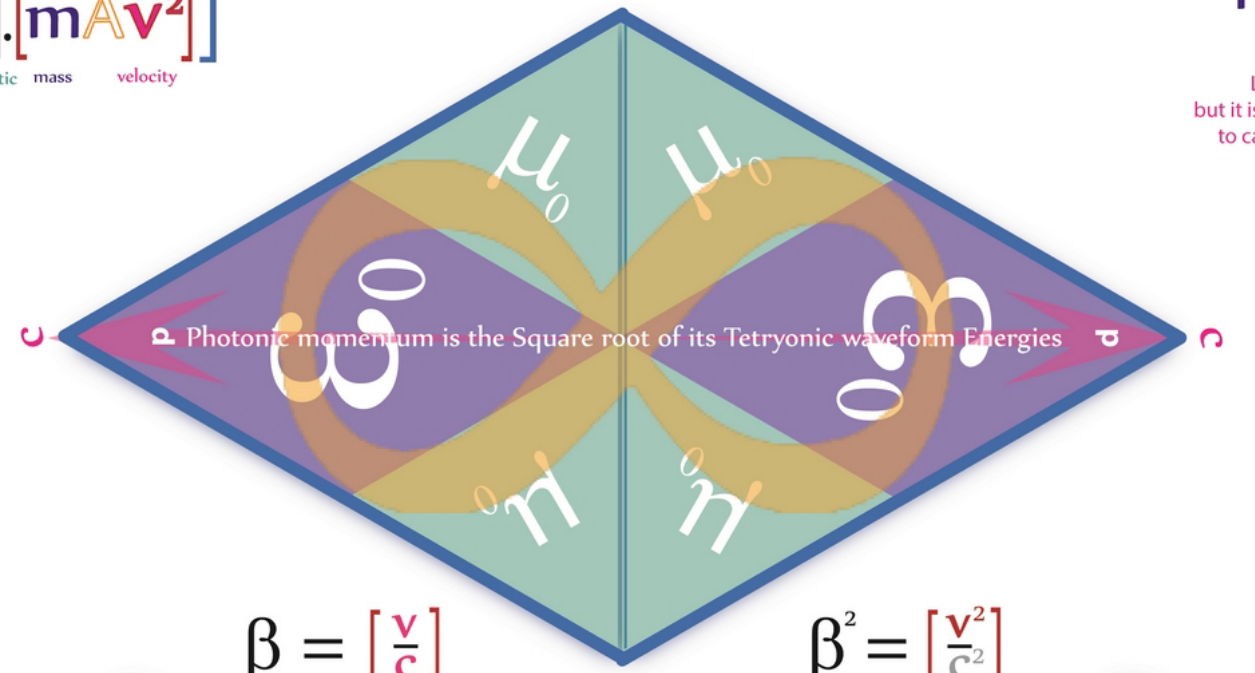
The Speed of Light is the 'natural' speed of Energy propagation and remains a Universal constant (but it is not a Limit)

$$mv^2 = KE = hv^2$$

Light cannot have zero velocity [stand still] but it is possible (against Einstein's though experiment) to catch up to a photon and observe its waveform

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[m_{\text{mass}}A_{\text{velocity}}0^2\right]\right]$$ (EM Field; Planck quanta)

Photons are velocity dependent ElectroMagnetic masses

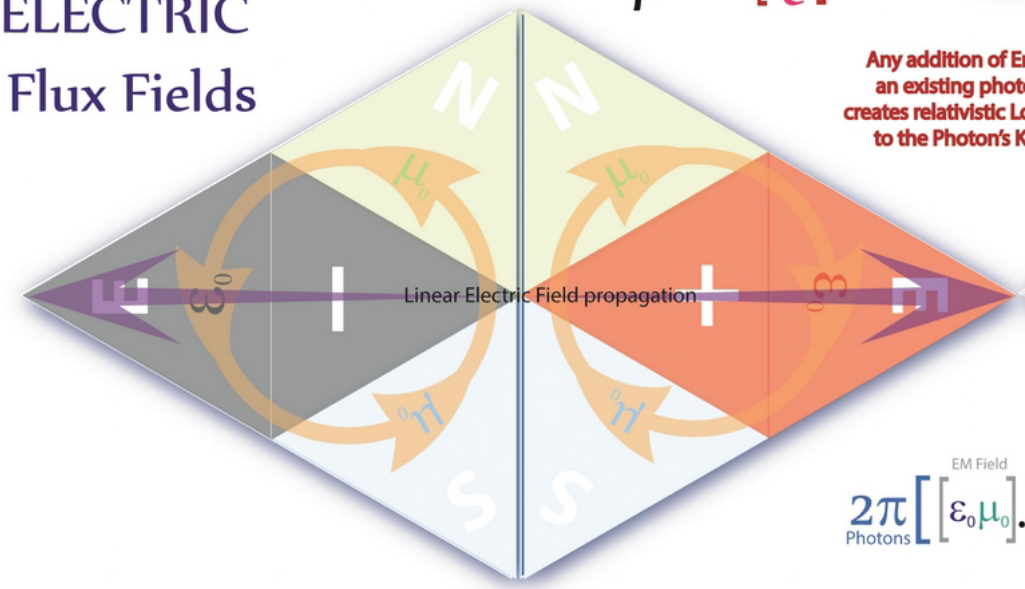


$$4n\pi_{\text{Matter}}\left[\left[\varepsilon_0\mu_0\right]_{\text{ElectroMagnetic}}.\left[m_{\text{mass}}A_{\text{velocity}}v^2\right]\right]$$ (EM Field; Planck quanta)

Matter contains standing EM wave energy moving at the speed of light

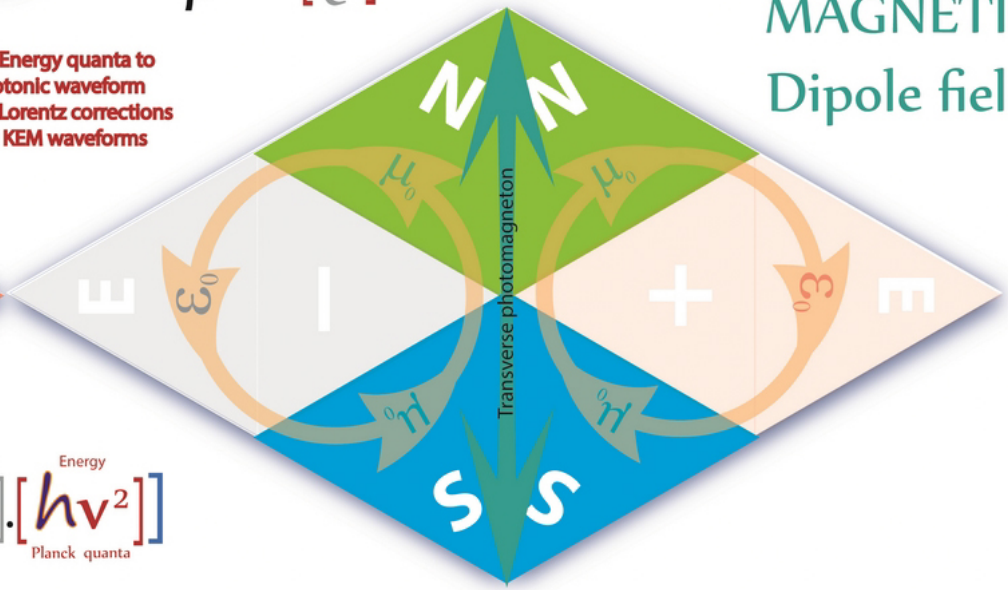
$$\beta = \left[\frac{v}{c}\right] \qquad \beta^2 = \left[\frac{v^2}{c^2}\right]$$

ELECTRIC Flux Fields



Any addition of Energy quanta to an existing photonic waveform creates relativistic Lorentz corrections to the Photon's KEM waveforms

MAGNETIC Dipole fields

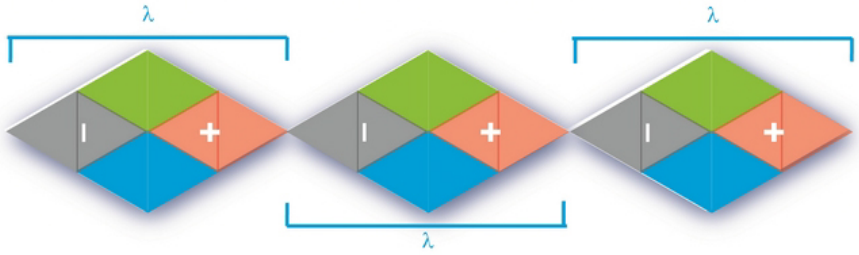


$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{Planck quanta}}.\left[h_{\text{Energy}}v^2\right]\right]$$ (EM Field)

λ

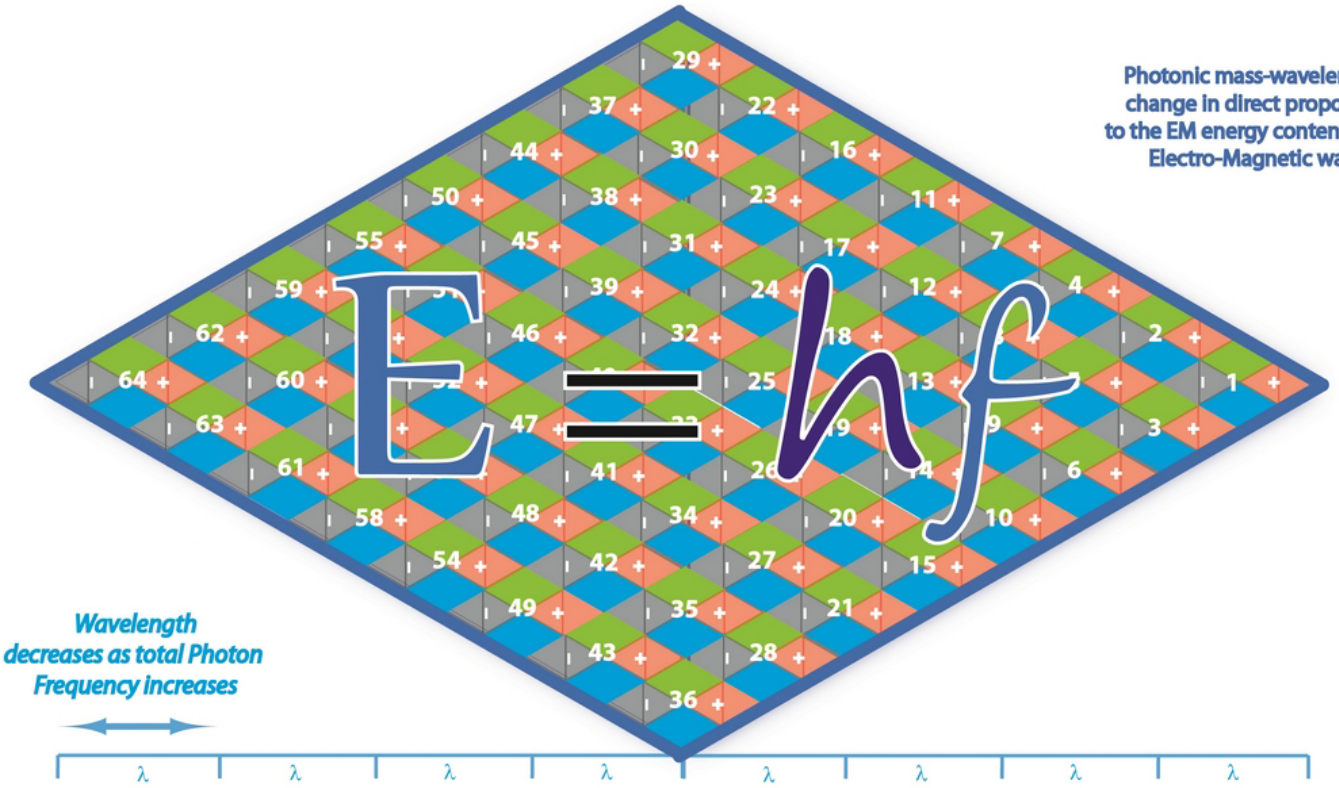
Wavelength

Wavelength is a measure of the distance between repetitions of geometric features such as maximums, minimums, or zero-points



In physics, the wavelength of a sinusoidal wave is the spatial period of the wave – the distance over which the wave's shape repeats. It is usually determined by considering the distance between consecutive corresponding points of the same phase, such as crests, troughs, or zero crossings, and is a characteristic of both traveling waves and standing waves, as well as other spatial wave patterns.

The concept can also be applied to periodic waves of non-sinusoidal geometry



Photonic mass-wavelengths change in direct proportion to the EM energy content of any Electro-Magnetic wave

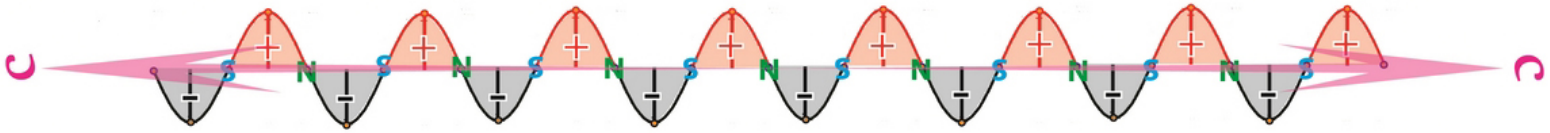
Wavelength decreases as total Photon Frequency increases

$$\lambda \left[\frac{A}{c} \right]$$

Wavelength

Wavelength is the inverse of Wavenumber

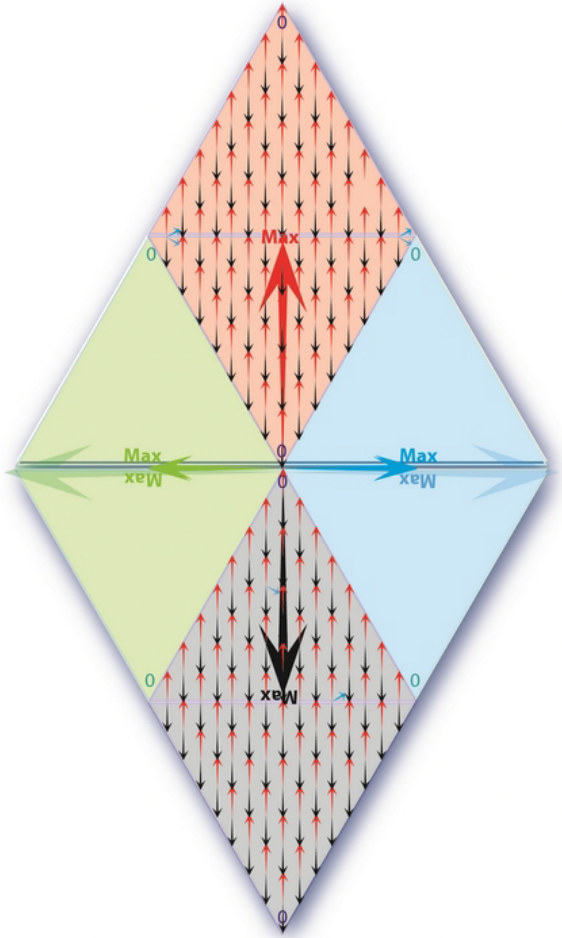
$$\left[\frac{c}{A} \right] \tilde{\nu} = 1/\lambda$$



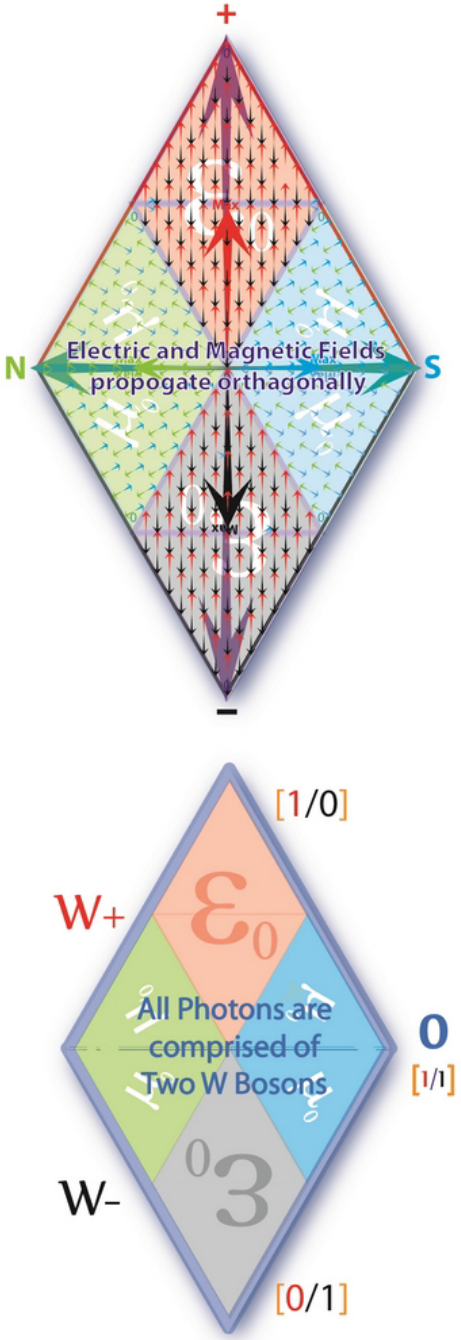
299,792,458 metres
Linear measure of Distance per second

Photon EM strength vectors

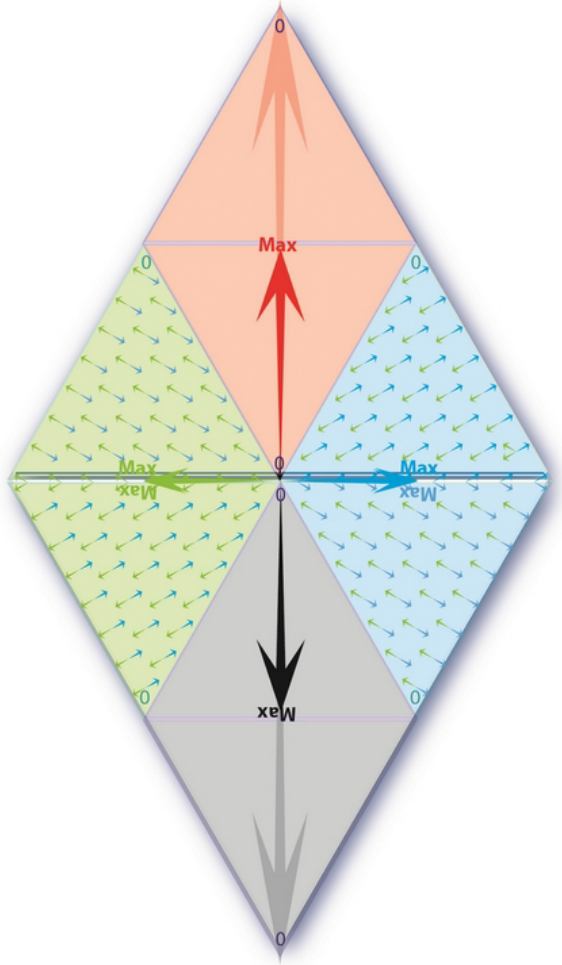
Electric field force vectors



When E field flux is at Maximum
B field flux is at Minimum



Magnetic field force vectors



When B field flux is at Maximum
E field flux is at Minimum

Celeritas

[Frequency and Wavelength]

EM waves are typically described by any of the following three physical properties:

frequency *f*;
wavelength λ, or
photon energy E

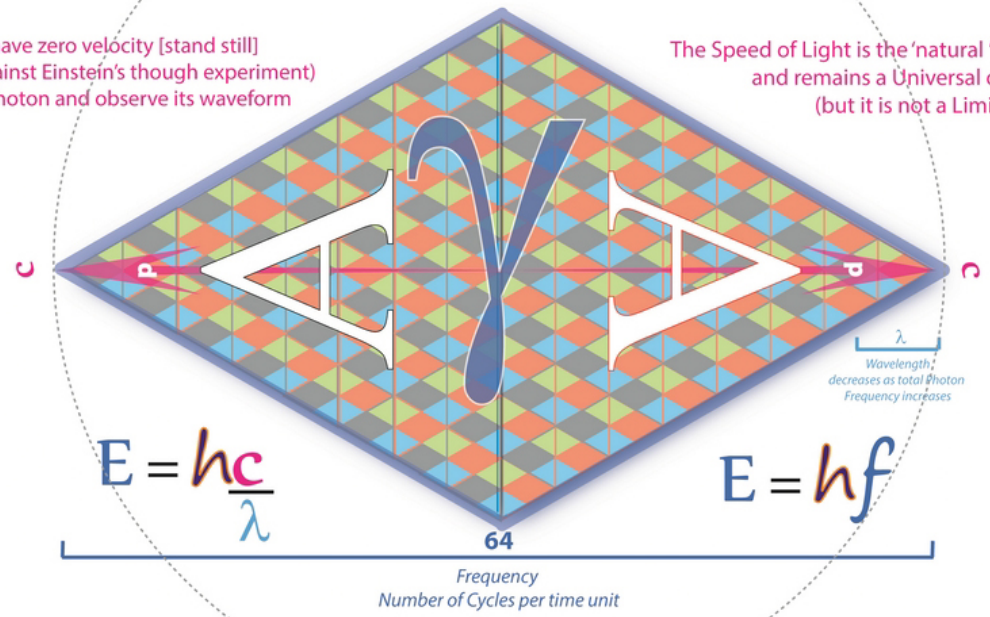
$$mv^2 = KE = hv^2$$

$$c^2$$

All Photons contain Energy momenta and therefore have electromagnetic mass but they are 'Matterless' geometries

Light cannot have zero velocity [stand still] but it is possible (against Einstein's though experiment) to catch up to a photon and observe its waveform

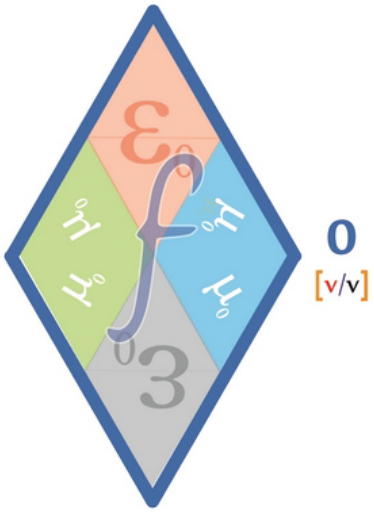
The Speed of Light is the 'natural ' speed of Energy and remains a Universal constant (but it is not a Limit)



$$E = \frac{hc}{\lambda}$$

$$E = hf$$

Momentum, Frequency and Wavelength are all related through c & c² geometries



0
[v/v]

Wavenumber

$$\frac{m}{s}\cdot\frac{s}{m^2}\left[\frac{c}{A}\right]\frac{1}{m}$$

$$\tilde{\nu} = 1/\lambda$$

ElectroMagnetic Fields

$$\varepsilon_0\mu_0 = \frac{1}{c^2}$$

1.112650056e-17

$$\lambda$$

$$m\left[\frac{A}{c}\right]\frac{m^2}{s}\cdot\frac{s}{m}$$

Wavelength

Velocity of Light

$$c = \left[\left[\frac{c^2}{A}\right]\cdot\left[\frac{A}{c}\right]\right]$$

$$c_0 = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$$

Frequency (*f*) Wavelength (λ)

$$f$$

$$\frac{m^2}{s^2}\cdot\frac{s}{m^2}\left[\frac{c^2}{A}\right]\frac{1}{s}$$

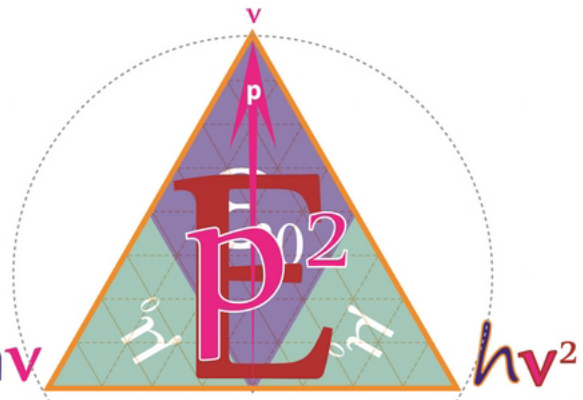
Frequency

mass-Energy momenta

$$n\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[m A v^2 \right] \right]$$

mass — EM Field — Planck quanta — ElectroMagnetic — mass — velocity

Throughout history Physicists have sought relationships between EM mass-Energy and momenta in an attempt to discern the true Nature of these physical properties



In Physics, the energy-momentum relation is a relation between the energy, momentum and the mass of a body:

$$E = mv \qquad E = mv^2 \qquad c = \frac{1}{\sqrt{\varepsilon_0 \mu_0}}$$

Newton **Leibnitz** **Maxwell**

Linear momentum

$$kg\,\frac{m}{s}$$

$$E$$

Energy

$$kg\,\frac{m^2}{s^2}$$

Velocity of Light

$$v = \left[\left[\frac{c^2}{A} \right] \cdot \left[\frac{A}{v} \right] \right]$$

f — Scalar Frequency

λ — Linear Wavelength

Planck **Einstein** **de Broglie**

$$E = hv \qquad E = hf \qquad \frac{h}{p}$$

de Broglie wavelength

$$\left[\frac{h}{p} \right] \; m$$

Wavelength

Compton Frequency

$$\frac{1}{s} \left[\frac{E}{h} \right]$$

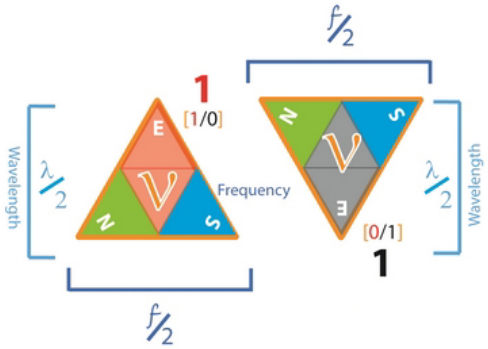
Planck's Constant

$$kg\,\frac{m^2}{s}$$

de Broglie wavenumber

$$\left[\frac{p}{h} \right] \; \frac{1}{m}$$

ZPF
Wavelet

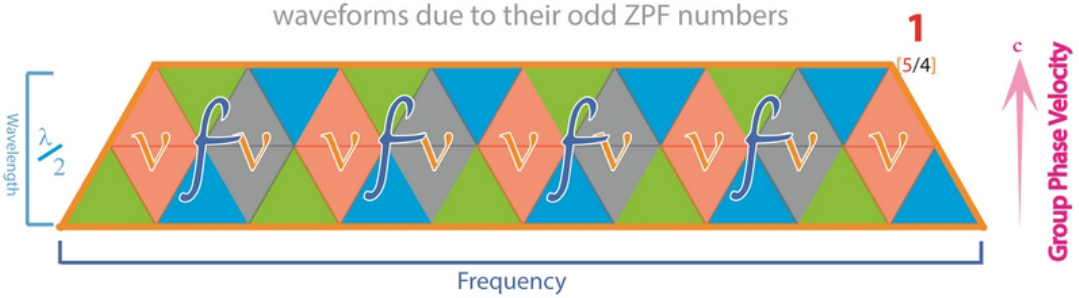


Bosons

Charge Carriers
$E = h\nu$

W+ boson

Bosons are half wavelength - non-Integer frequency waveforms due to their odd ZPF numbers



$$mv^2 = E = hv^2$$

All Bosons are transverse ODD quanta EM masses

The interchanging of Quantum number [ν]

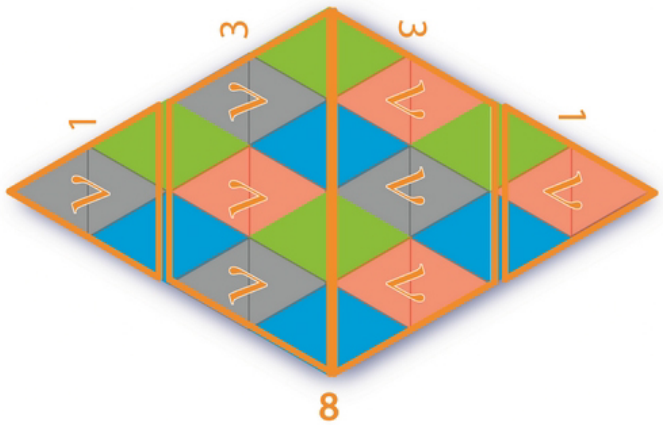
$$2\nu = f$$

with Photon Frequency [f] is a cause of confusion

All Photons are longitudinal EVEN quanta EM masses

$$2h\nu = E = hf$$

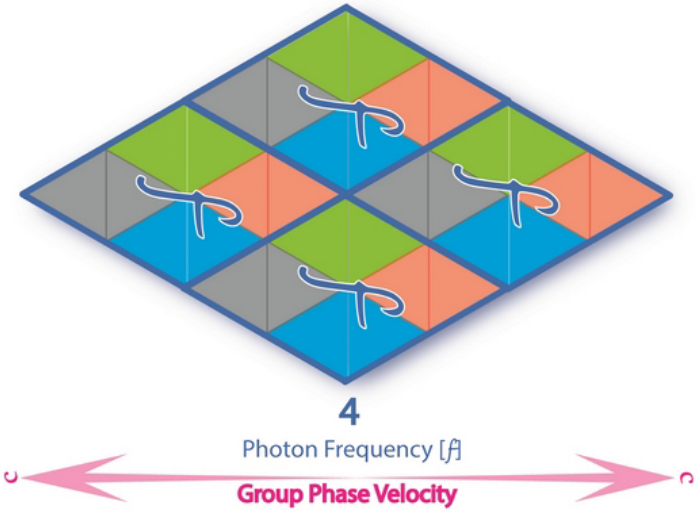
Transverse Bosons



EM Force Carriers
$E = hf$

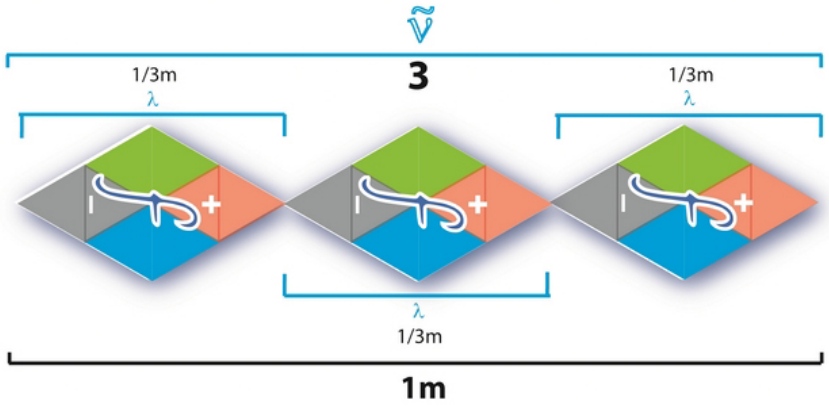
Photons

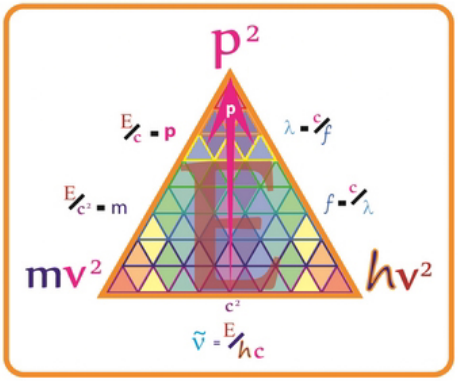
Longitudinal Photons



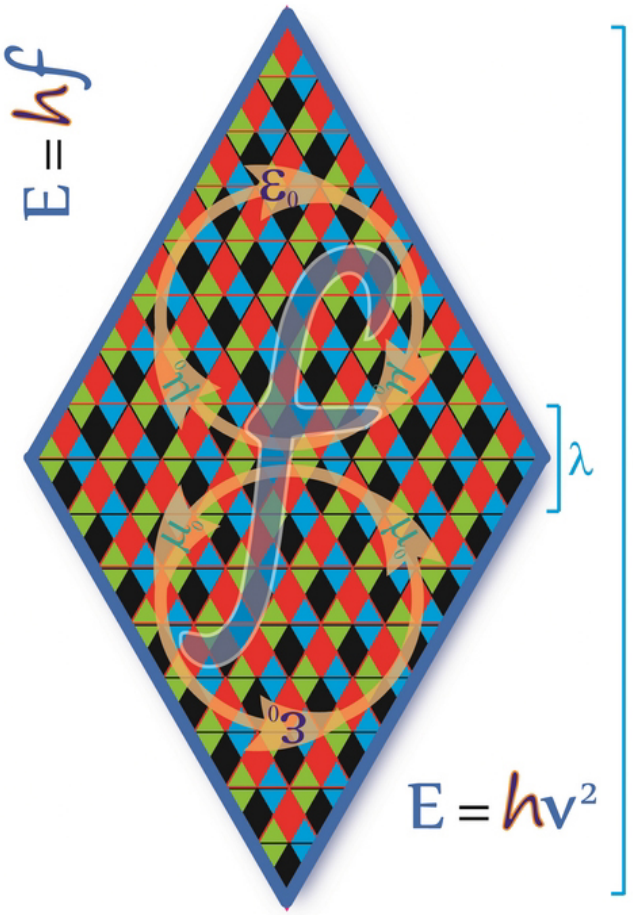
Wavenumbers

Wavenumbers are the spatial equivalent of Frequency



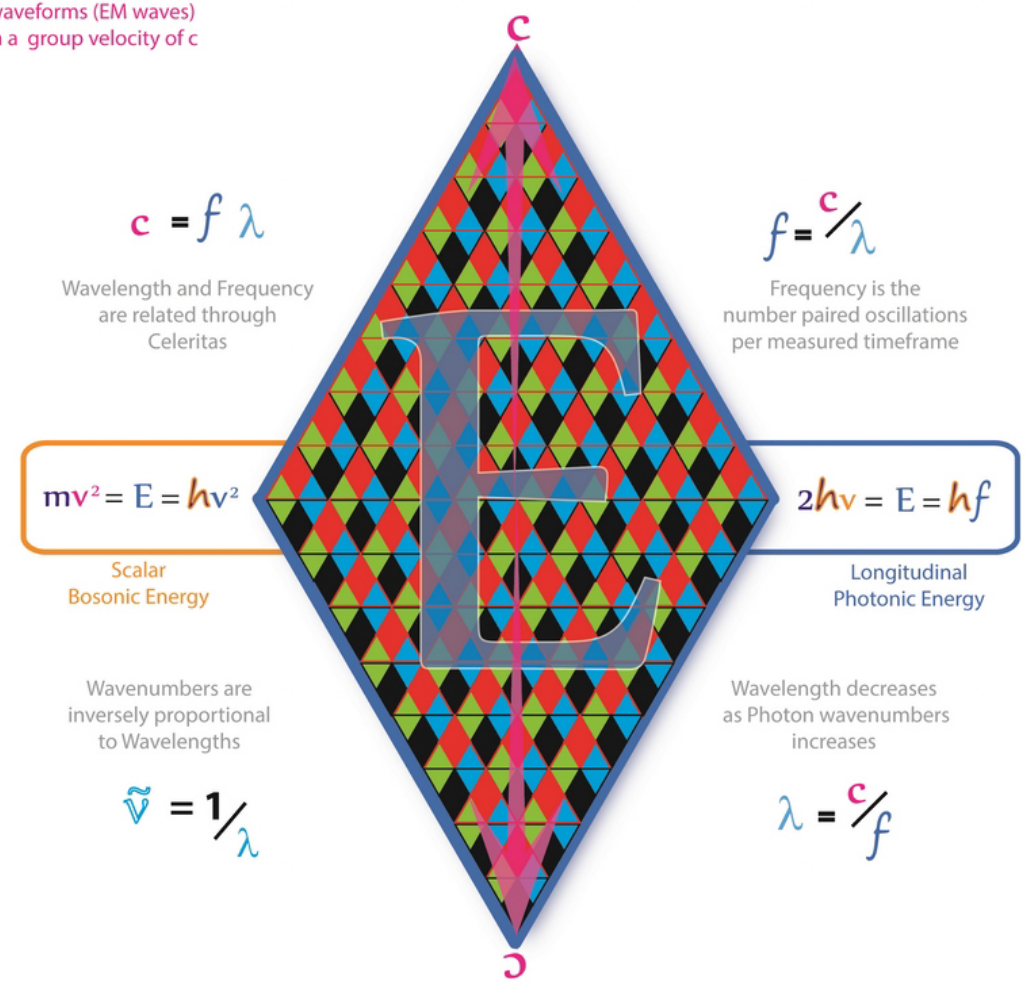


All 2D Energy waveforms (EM waves) propagate with a group velocity of c



Wavelength and Frequency are related to the group velocity of quanta in an EM wave

Frequency-Wavelength geometry



Energy-Momentum geometry

Photons

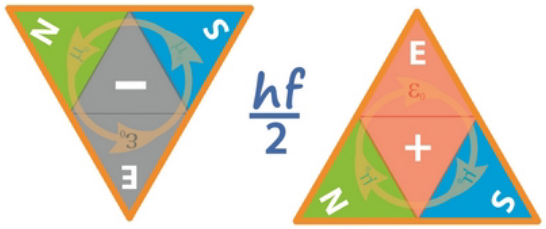
Photons are 2π EM masses that have:

Frequency
Wavelength
Energy
Momentum
Kinetic Energy
Magnetic Moment
Probabilistic Properties

and can

Refract
Deflect and
Disperse

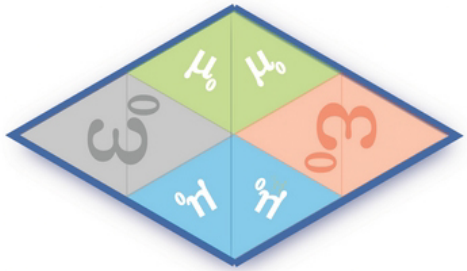
ZPFs [Bosons] are
1/2 wavelength photons



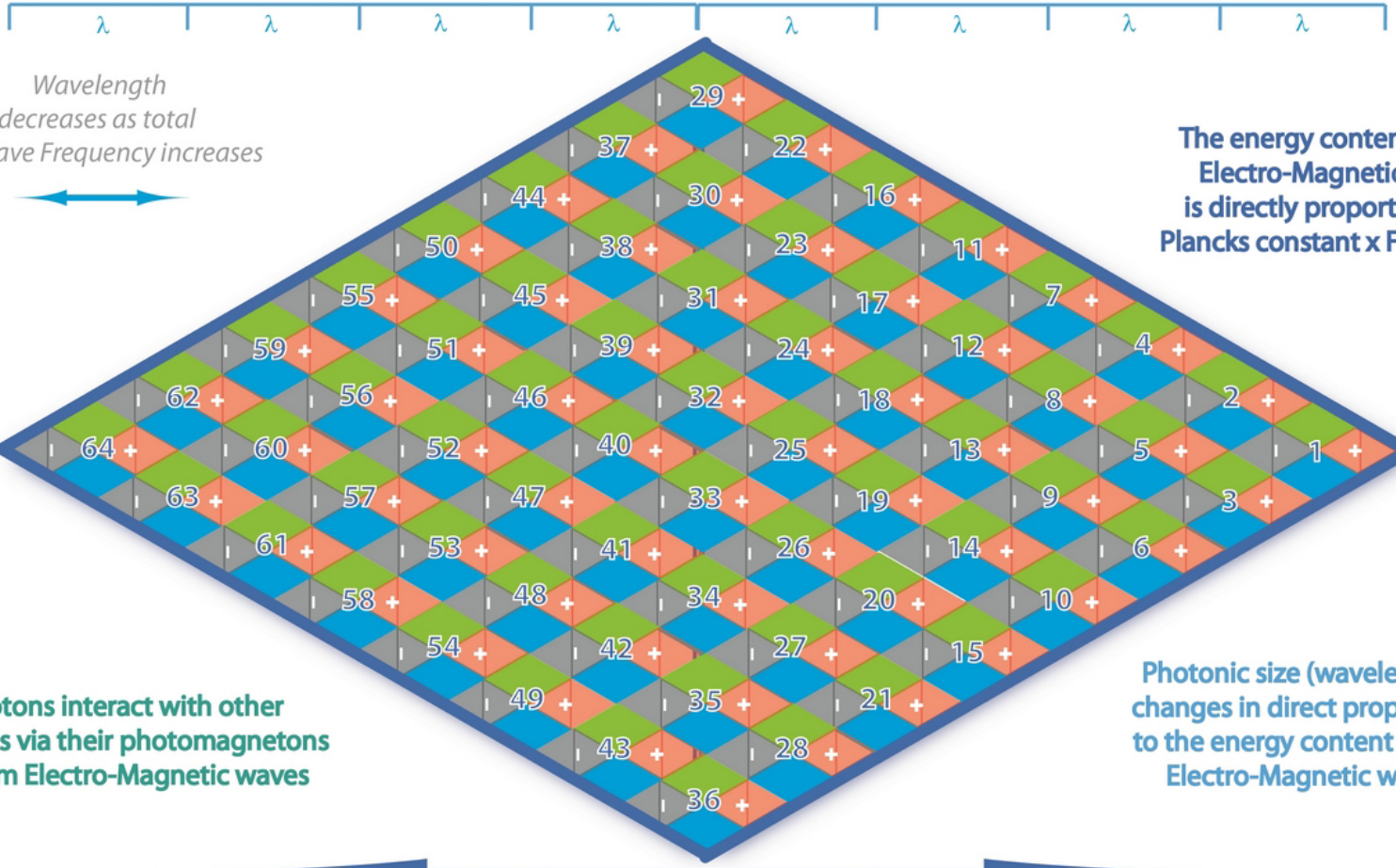
$\frac{hf}{2}$

$2v = f$

2π Planck Constants
Photon energy density



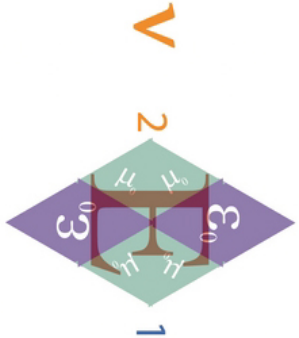
hf



Wavelength decreases as total EM wave Frequency increases

The energy content of any Electro-Magnetic wave is directly proportional to Plancks constant x Frequency

$E = hf$



Photons interact with other photons via their photomagnetons to form Electro-Magnetic waves

Photonic size (wavelength) changes in direct proportion to the energy content of any Electro-Magnetic wave

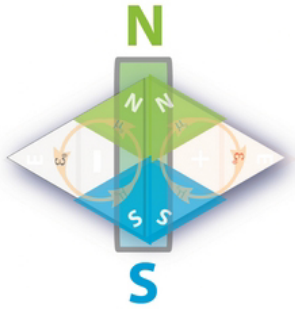
64
Frequency
Number of Cycles per time unit

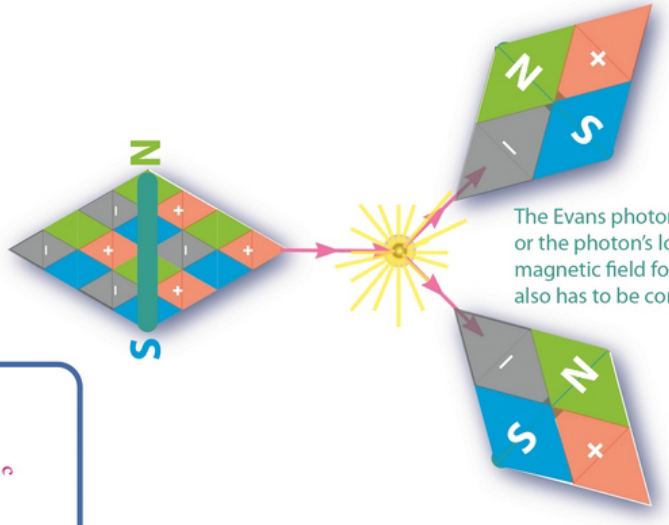
Photonic Properties

The photon has several properties that distinguish it from all other subatomic particles.

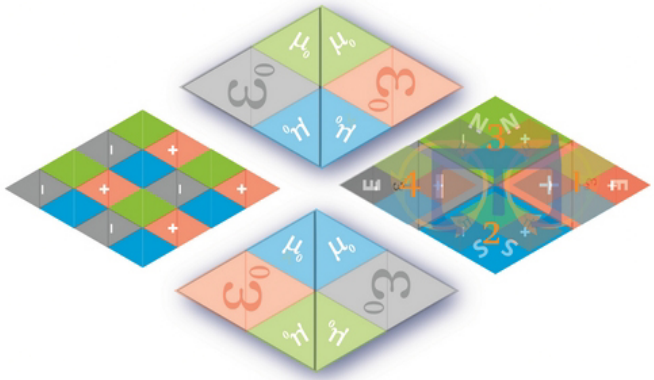
It is the only elementary particle wherein a high-energy photon can transform/split into two or more low-energy photons.

A photon is a magnetic dipole. It is an elementary magnet. Evans discovery of the photon's longitudinal magnetic field in 1992 is considered as significant as Einstein's discovery of Relativity.

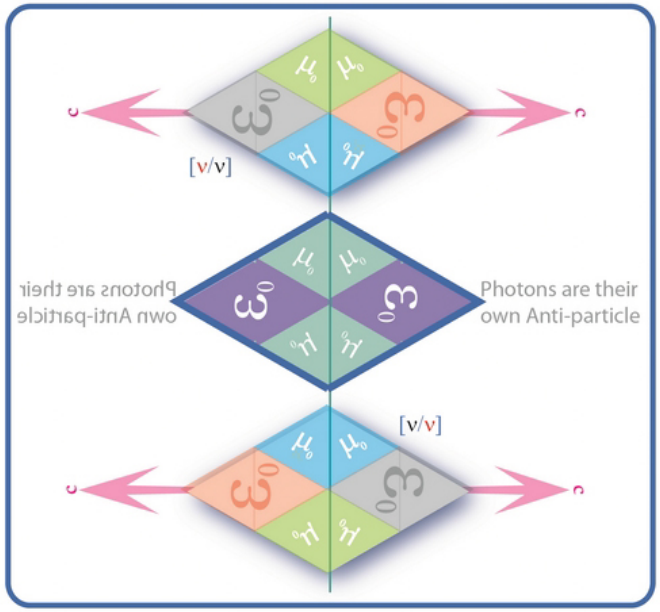




The Evans photomagneton or the photon's longitudinal magnetic field for a photon also has to be conserved.



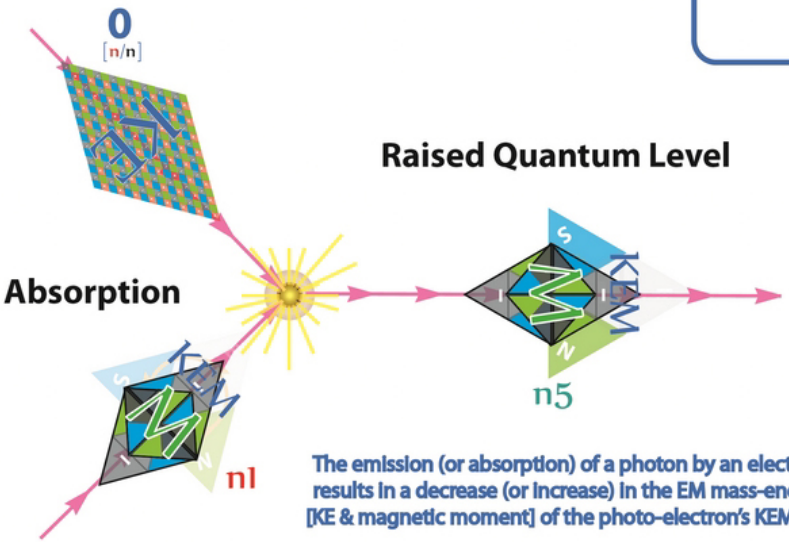
Photons can form super-position EM waves



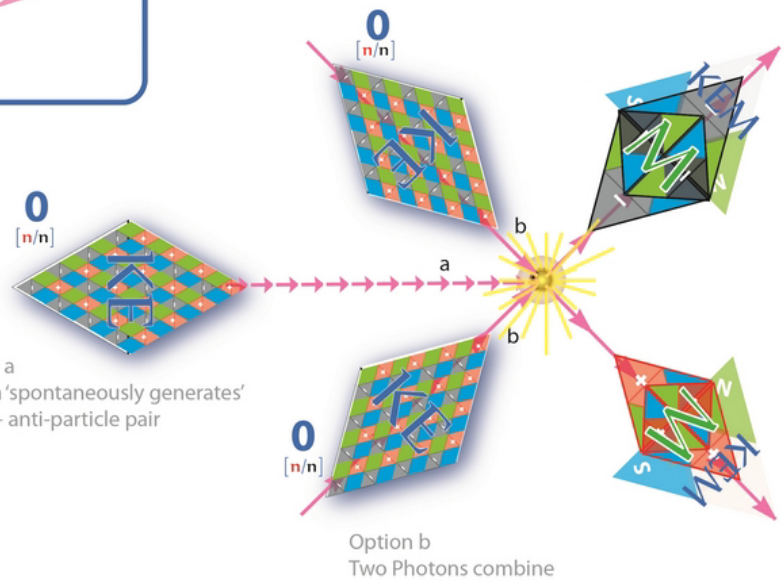
PAIR PRODUCTION
A photon with sufficient energy can be transformed into a real electron-positron pair.

The EM mass-energy is conserved as per Einstein's equivalence of mass and energy.

The photon's magnetic charge is conserved in the magnetic moments of the created electron-positron pair.



The emission (or absorption) of a photon by an electron, results in a decrease (or increase) in the EM mass-energy [KE & magnetic moment] of the photo-electron's KEM field



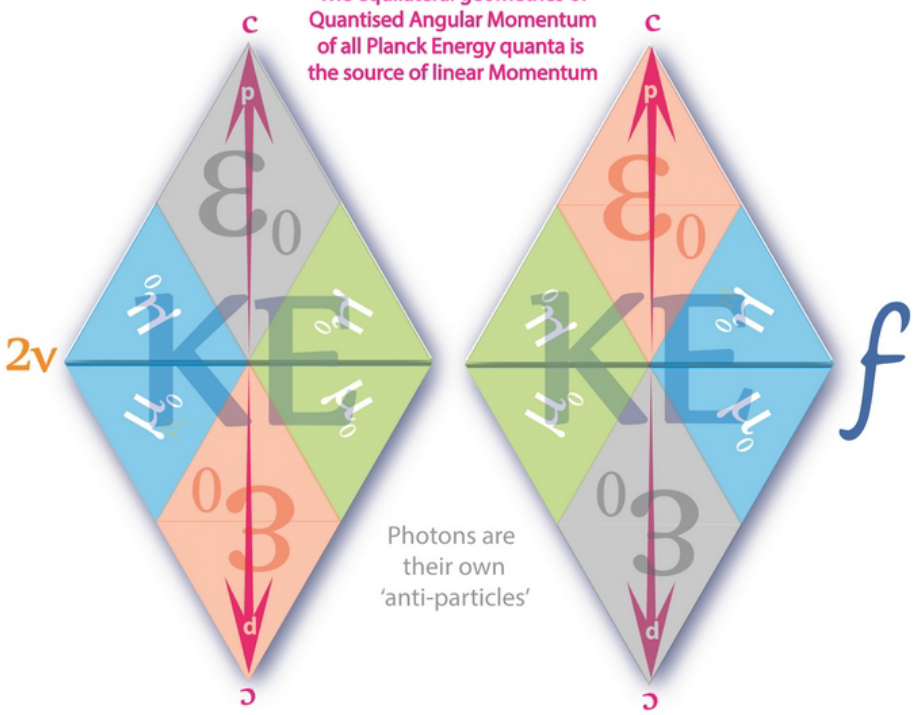
Option a
Photon 'spontaneously generates' a pair + anti-particle pair

Option b
Two Photons combine

Photonic Energy

$$2p^2 = KE = 2mv^2$$

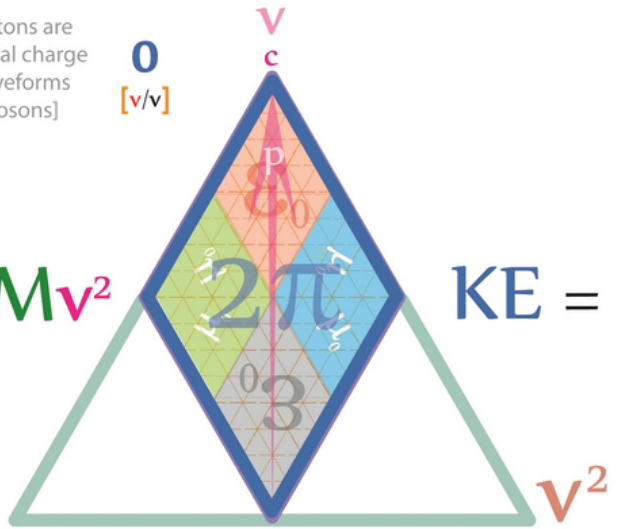
The equilateral geometries of Quantised Angular Momentum of all Planck Energy quanta is the source of linear Momentum



Photons are their own 'anti-particles'

Photons are neutral charge waveforms [Bosons]

$$\frac{0}{[v/v]}$$



$$KE = \frac{1}{2}Mv^2 \qquad KE = \frac{E}{2}$$

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field (ElectroMagnetic) — Planck quanta (mass, velocity)

$$KE$$

$$2\pi\left[mAv^2\right]$$

Planck quanta: mass, velocity

$$m$$

Photons are kinetic energy "KE" wave packets:

$KE = (1/2) * m_p * v2$

$= 1/2 * (E/c2) * c2$

$= E/2$

They have momentum "p":

$p = m_p * v$

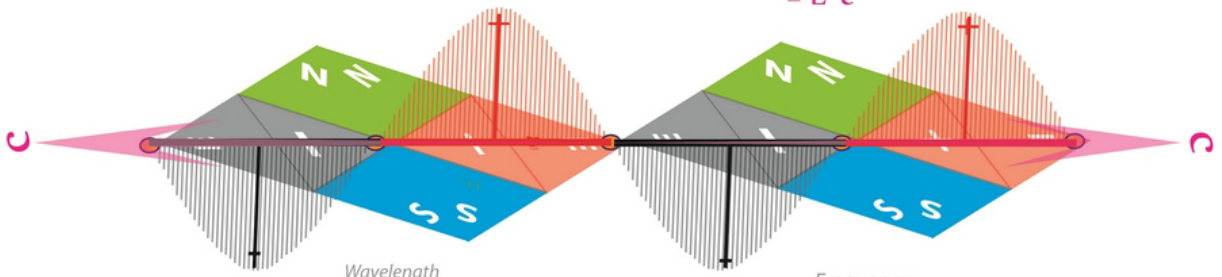
$= (E/c2) * c$

$= E * c$

$$2hv = E = hf$$

As Photons are 2D EM energy waveforms they should always be referred to as having EM mass-Energy equivalence

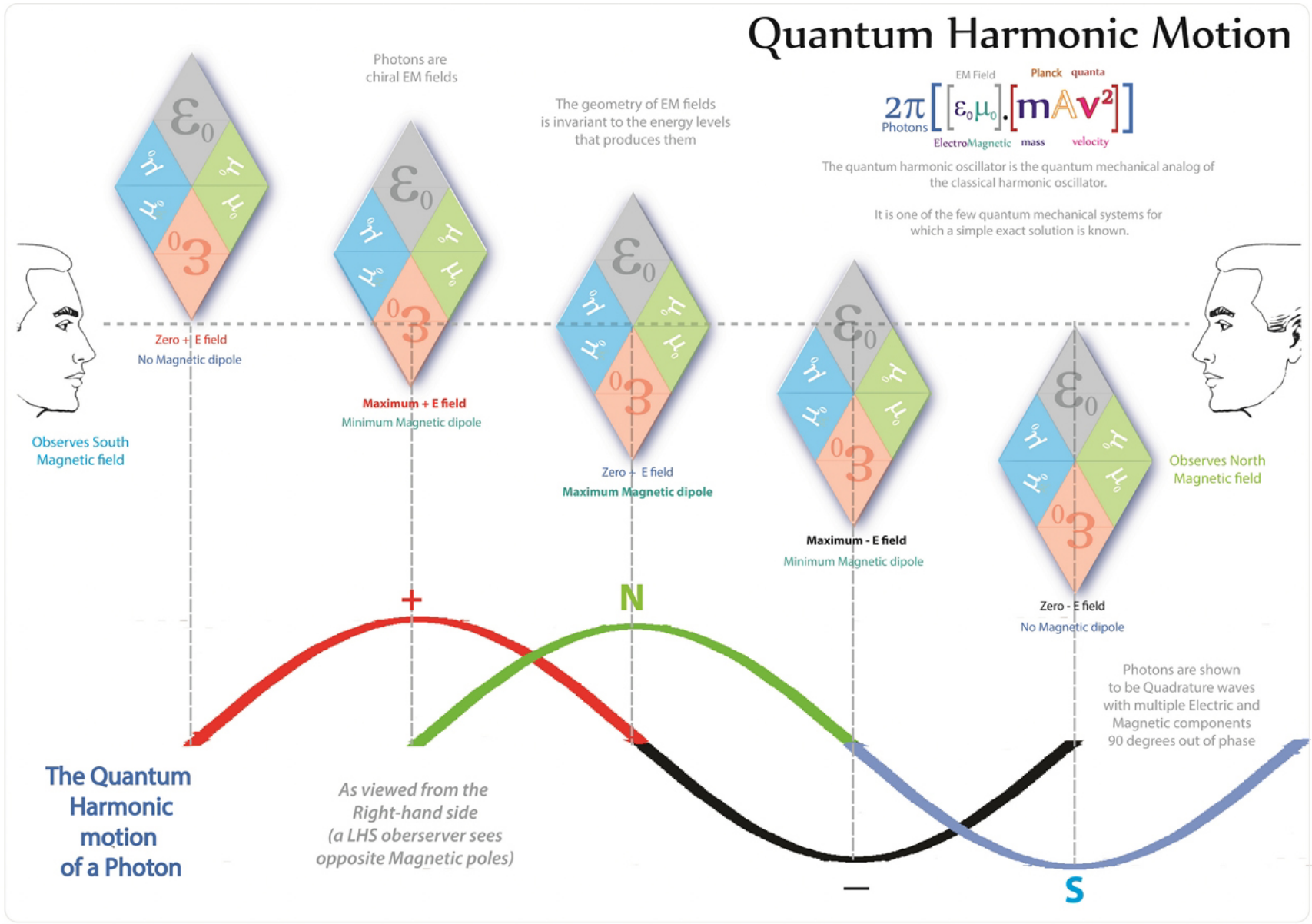
$$E_\gamma = 2mc^2$$



Wavelength decreases as Photon internal Frequency increases

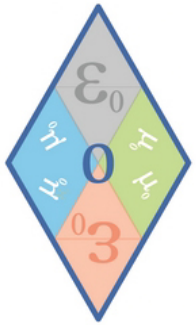
Frequency Number of Cycles per time unit

Quantum Harmonic Motion



Euler's Formula

$e^{i\pi} = -1$



$e^{i\pi} + 1 = 0$

Euler's formula is often considered to be the basis of the complex number system. In deriving this formula, Euler established a relationship between the trigonometric functions, sine and cosine, and e raised to a power

$$e^{ix} = \cos(x) + i\sin(x)$$

a mathematical description of EM-Energy waveforms

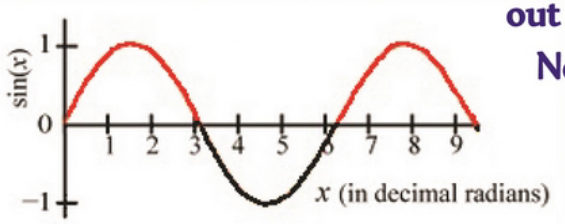
Leonhard Euler

(15 April 1707 – 18 September 1783)

Transverse EM fields are 180° out of phase

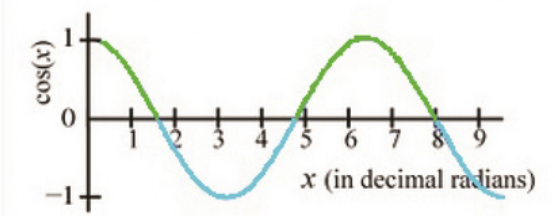
Positive fields are out of phase with Negative fields

Magnetic fields are out of phase with Electric fields



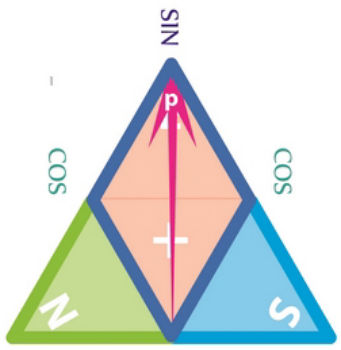
$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

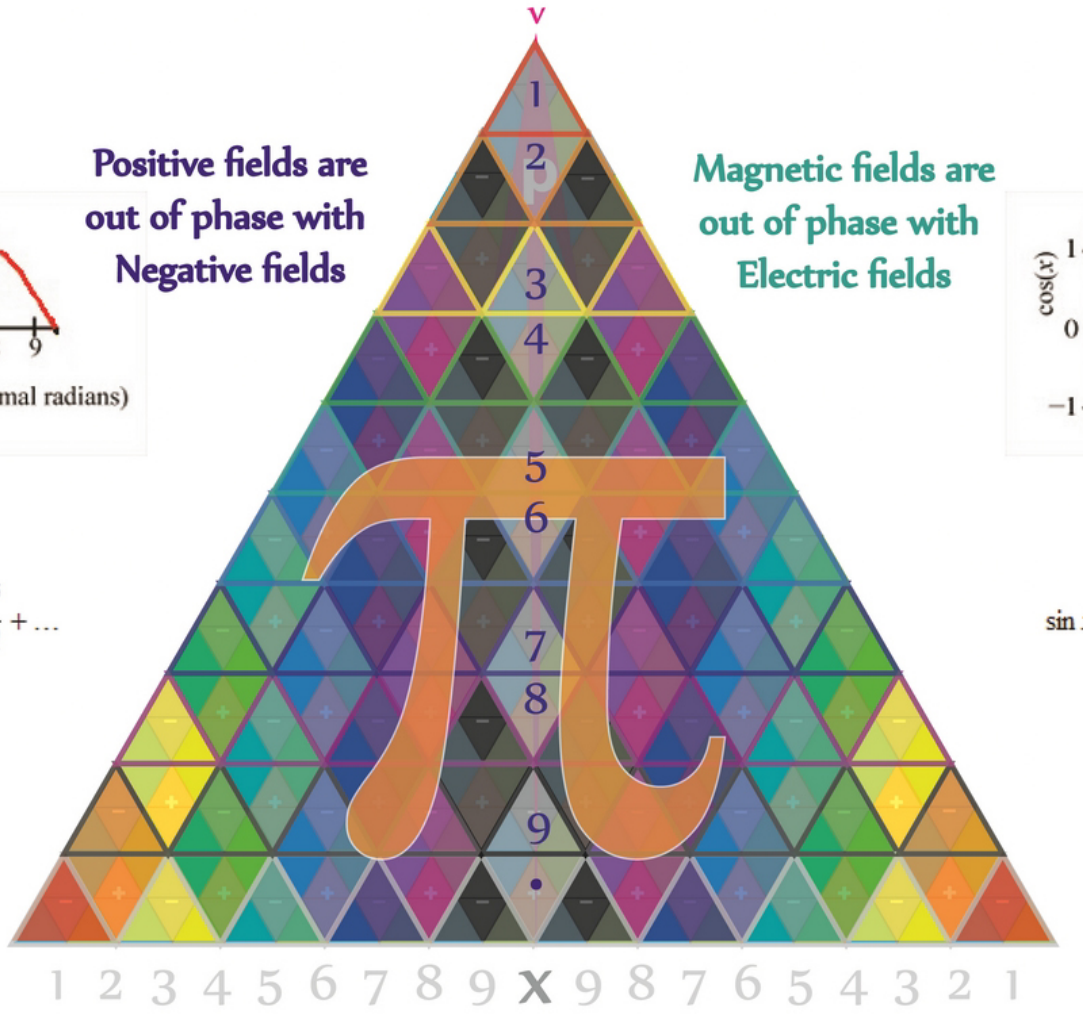
$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

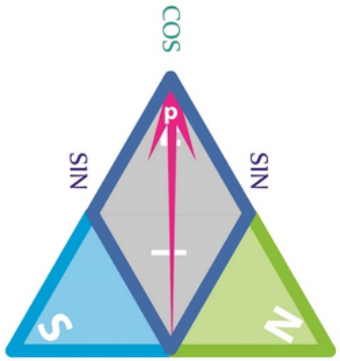


$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots$$

$$\sin x + \cos x = 1 + x - \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

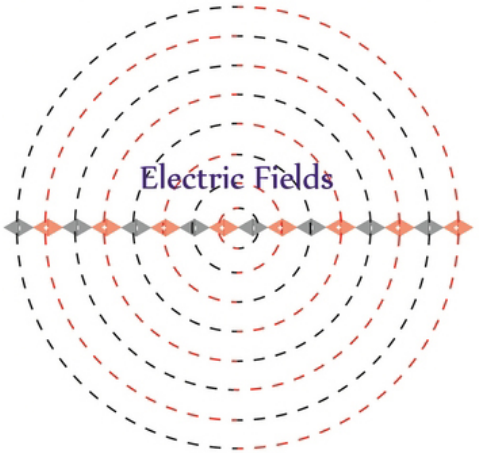


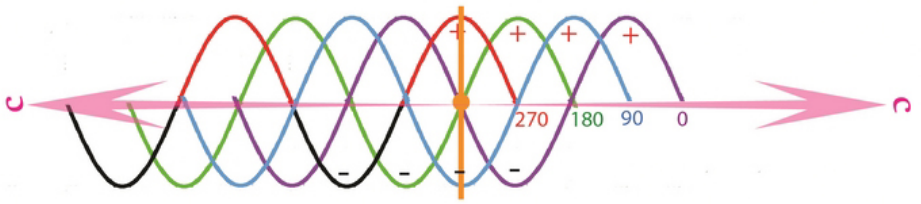


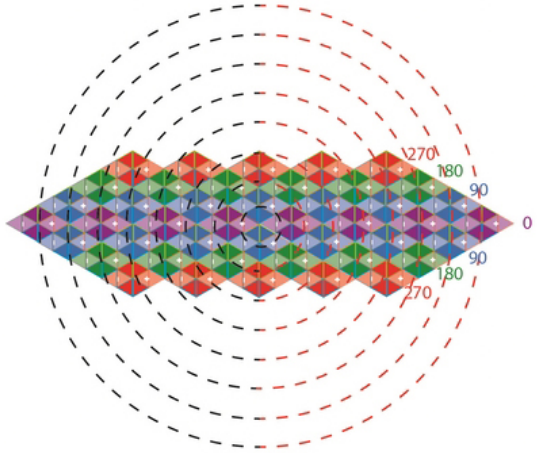


The above geometry is reflective of Negative Charge geometry
the momentum of the nett charged geometry is the Square root of Negative 1

Photonic E fields



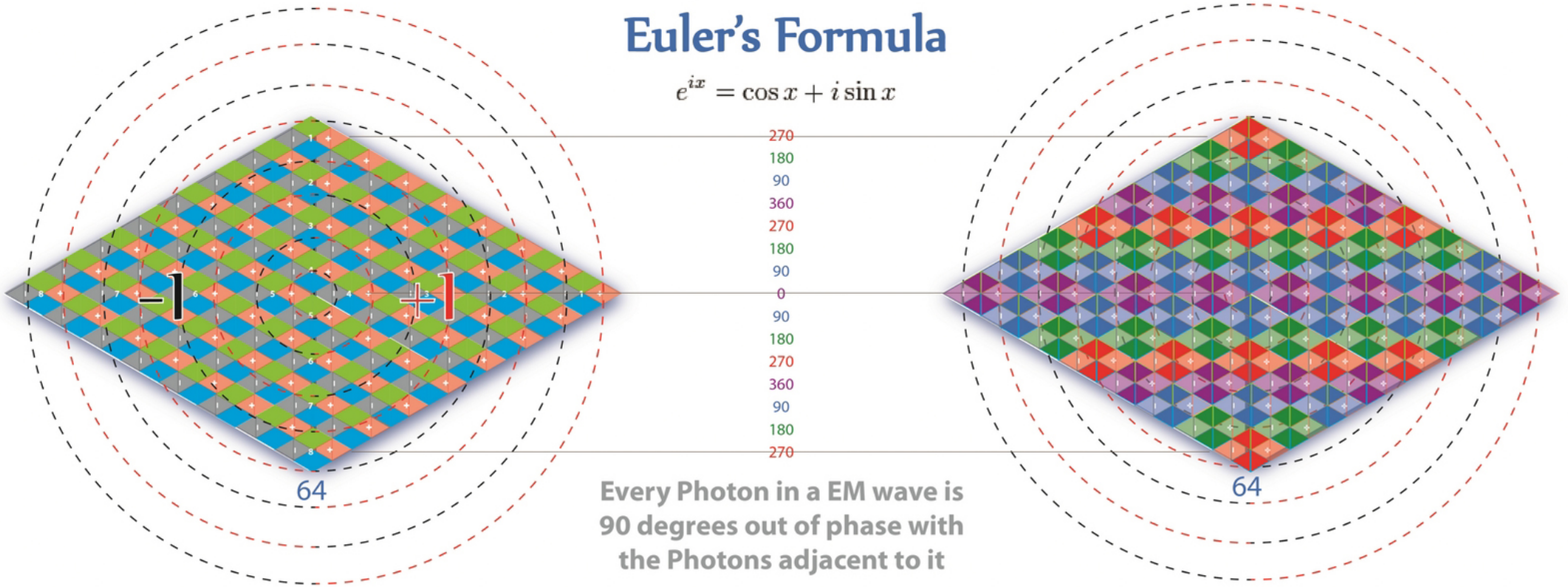




$$e^{i\pi} = -1$$

EM waves are a Natural expression of Euler's Formula

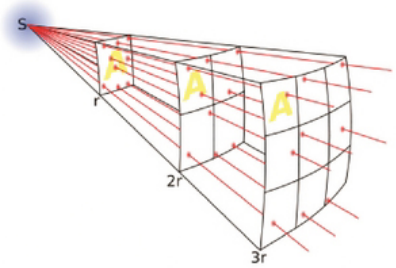
$$e^{ix} = \cos x + i \sin x$$

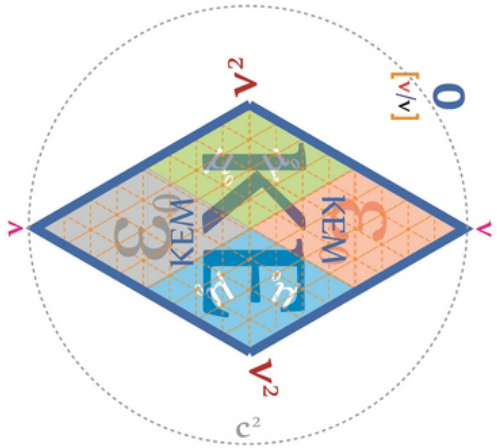


Every Photon in a EM wave is 90 degrees out of phase with the Photons adjacent to it

Inverse Square Law

Any point source which spreads its influence equally in all directions without a limit to its range will obey the inverse square law

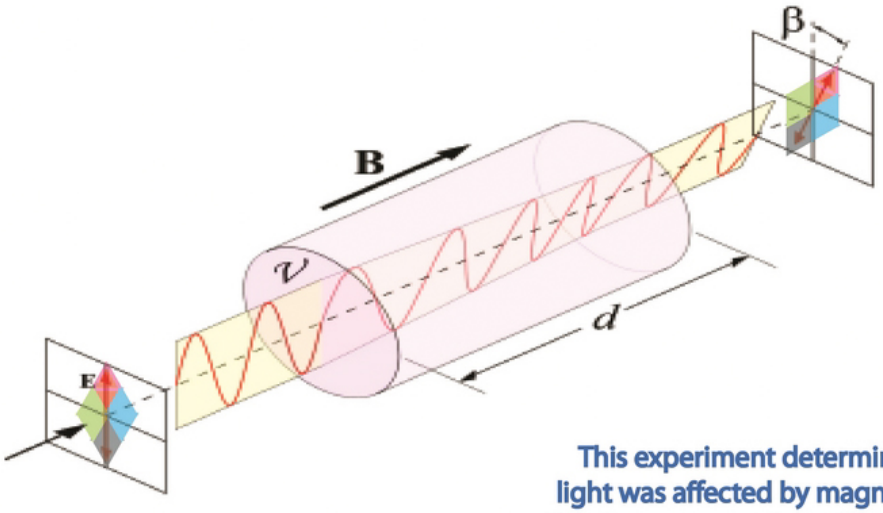




The Inverse Sqaure Law applies equally to Transverse and Longitudinal waveforms

Faraday Rotation

The Faraday effect or Faraday rotation is a Magneto-optical phenomenon, that is, an interaction between light and a magnetic field in a medium. The Faraday effect causes a rotation of the plane of polarization which is linearly proportional to the component of the magnetic field in the direction of propagation.



Evan's Photomagneton

A photon has a magnetic dipole.
It is an elementary magnet.
Evans discovery of the photon's longitudinal magnetic field in 1992 is as significant, as Einstein's discovery of relativity.

It helps in giving a physical interpretation of wave mechanics, two-slit interference and the Faraday effect, and is fully explained using Tetryonic Theory.

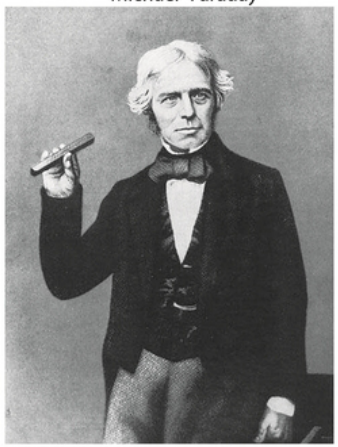
Discovered by Michael Faraday in 1845, the Faraday effect was the first experimental evidence that light and electromagnetism are related

Faraday summarized the entire effect as follows:

"Magnetic lines, then, in passing through silicated borate of lead, and a great number of other substances, cause these bodies to act upon a polarized ray of light when the lines are parallel to the ray, or in proportion as they are parallel to it: if they are perpendicular to the ray, they have no action upon it.

They give the diamagnetic the power of rotating the ray; and the law of this action on light is, that if a magnetic line of force be going from a north pole, or coming from a south pole, along the path of a polarized ray coming to the observer, it will rotate that ray to the right-hand; or, that if such a line of force be coming from a north pole, or going from a south pole, it will rotate such a ray to the left hand."

Michael Faraday



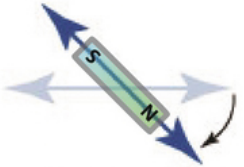
(22 September 1791 – 25 August 1867)

This experiment determined that light was affected by magnetic force. This "magneto-optical effect" was later termed the Faraday effect.

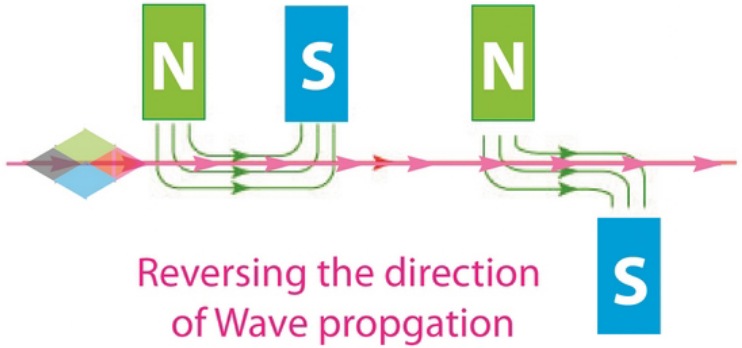
Faraday experimented with other substances that yielded similar results.

The resultant effect he termed "diamagnetism". Concluding that magnetism was an inherent property of all EM mass-ENERGY-Matter

Before the Magnetic field



After the Magnetic field



Reversing the direction of Wave propgation reverses the rotation effected by the external magnetic field

Every Photon and EM wave has polarised magnetic apexes as a result of the Planck quanta constituing them (creating Magnetic moments)

These Photo-Magnetic Moments allow for the interaction of Photons with external magnetic fields resulting in Faraday rotation of Photons and EM fields

Compton Scattering

The inelastic scattering of photons in matter results in a decrease in energy (increase in wavelength) of an X-ray or gamma ray photon, called the Compton effect.

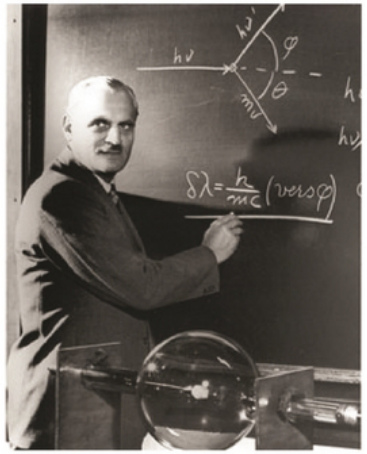
Part of the energy of the X/gamma ray is transferred to a scattering electron, which recoils and is ejected from its atom (which becomes ionized), and the rest of the energy is taken by the scattered, "degraded" photon.

$$\lambda = \frac{h}{mc}$$

Compton Effect Formula

$$\lambda' - \lambda = \frac{h}{m_e c}(1 - \cos\theta),$$

Arthur Compton



(September 10, 1892 – March 15, 1962)

Compton scattering

Gamma Ray

γ

X-ray

Incident photon λ_i

Target electron at rest

Recoil electron

ϕ

θ

$$p_e = \frac{\sqrt{E^2 - (m_e c^2)^2}}{c}$$

$$p_i = \frac{E_i}{c} = \frac{h\upsilon_i}{c} = \frac{h}{\lambda_i}$$

$$p_f = \frac{E_f}{c} = \frac{h\upsilon_f}{c} = \frac{h}{\lambda_f}$$

Scattered photon

λ_f

$$\lambda_f - \lambda_i = \Delta\lambda = \frac{h}{m_0 c}(1 - \cos\theta)$$

$$E = hf = \frac{hc}{\lambda} = mc^2$$

Compton frequency

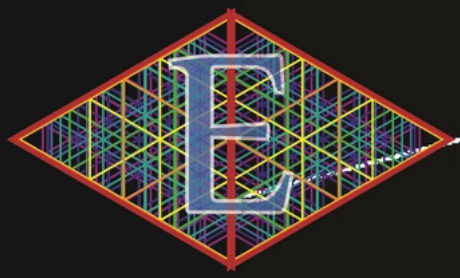
Degraded Photon

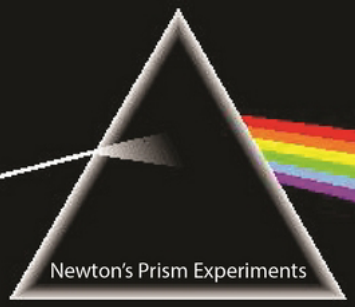
1666
Isaac Newton allowed sunlight from a small, circular hole to fall on a prism, producing a rainbow of color. Although the production of a rainbow by a clear crystal was known to the ancients, it was Newton who showed that the colors did not originate in the crystal, but rather were components of sunlight.

This array of colors he called a spectrum.

Refracting Prism

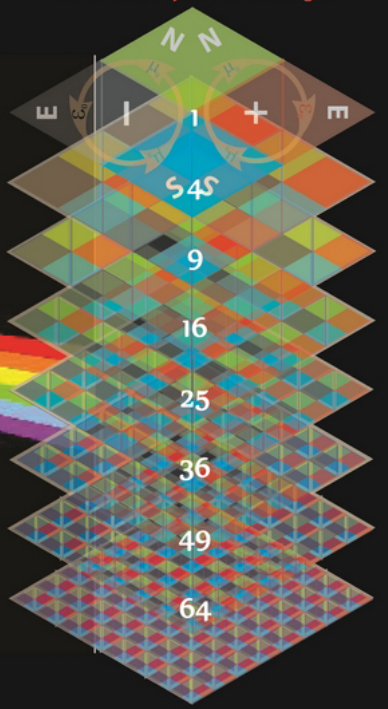
White Light





White Light is the result of superpositioned EM waves of differing wavelength Photons

William Herschel:
The Discovery of Infrared Light



Red
Orange
Yellow
Green
Aqua
Blue
Indigo
Violet

Johann Ritter:
The Discovery of Ultraviolet Ligh

1801
Saw the discovery (by Thomas Young) of interference patterns caused by light passing through a narrow slit. Up until this point, the wave theory of light (Huygens) had had nothing convincing to offer in opposition to the particle theory of light (Newton). Now it did, because you cannot explain interference using particles.

The term "light" is often extended to wavelength ranges that the eye cannot detect - to infrared radiation, which has a frequency less than that of visible light, and to ultraviolet radiation, which have a frequency greater than that of visible light.

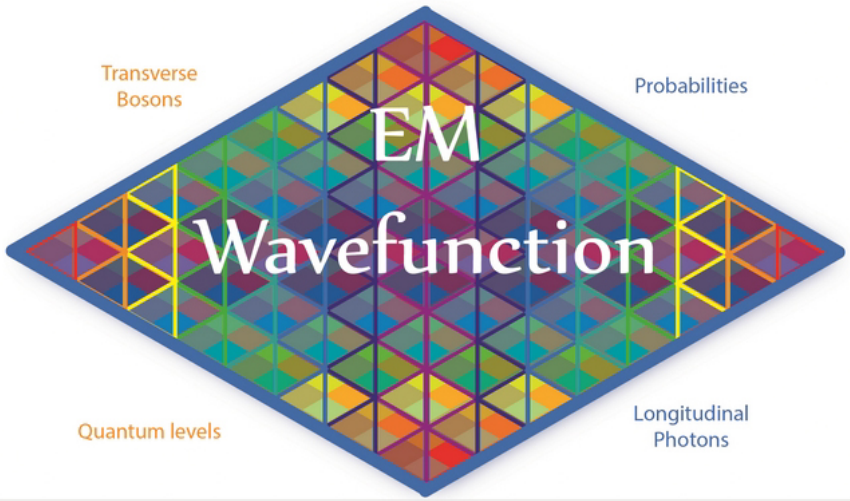
γ

Light has:

Velocity
Angular momenta
Frequency
Wavelength
Relatvistic Energy
Linear momentum
Kinetic Energies
Magnetic Moment

and can

Refract
Reflect
Defract
and
Disperse

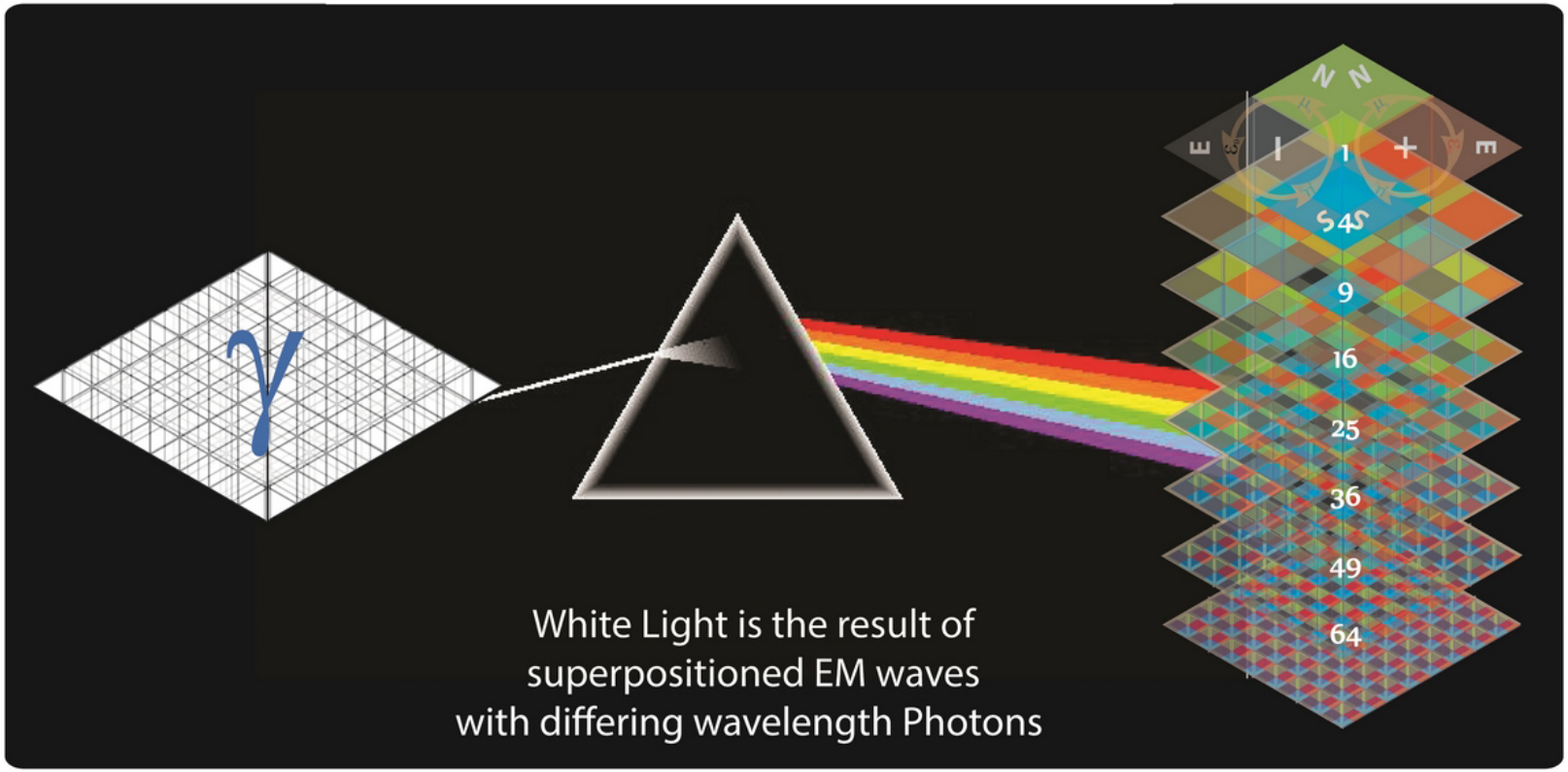


All EM waves possess Wavefunctions describing their probabilistic energy properties

ψ

White Light

White Light



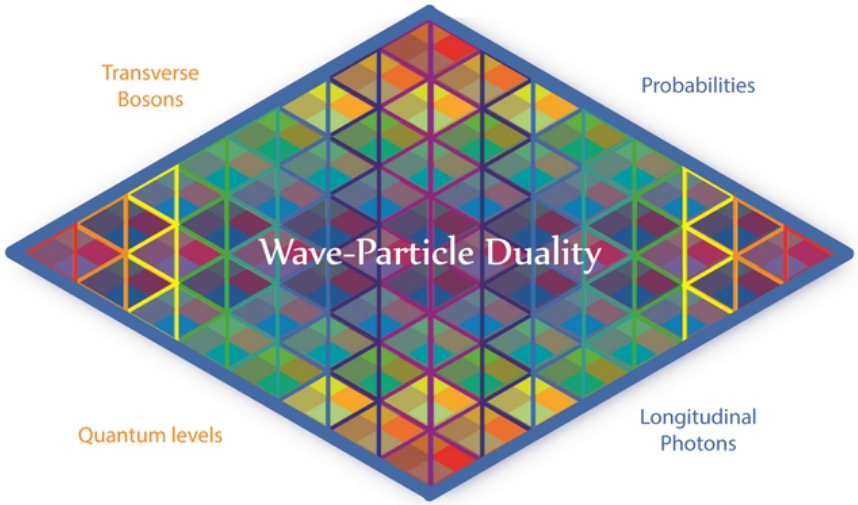
Red
Orange
Yellow
Green
Aqua
Blue
Indigo
Violet

Light has:

Velocity
Angular momenta
Frequency
Wavelength
Relatvistic Energy
Linear momentum
Kinetic Energies
Magnetic Moment

and can

Refract
Reflect
Defract
and
Disperse



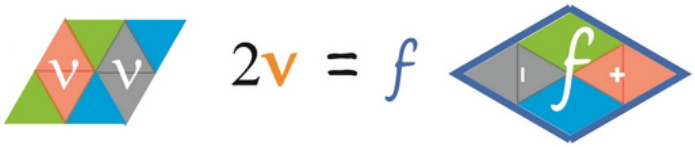
All EM waves
exhibit
Wave-Particle duality

Pair Production

$$mv^2 = E = hv^2$$

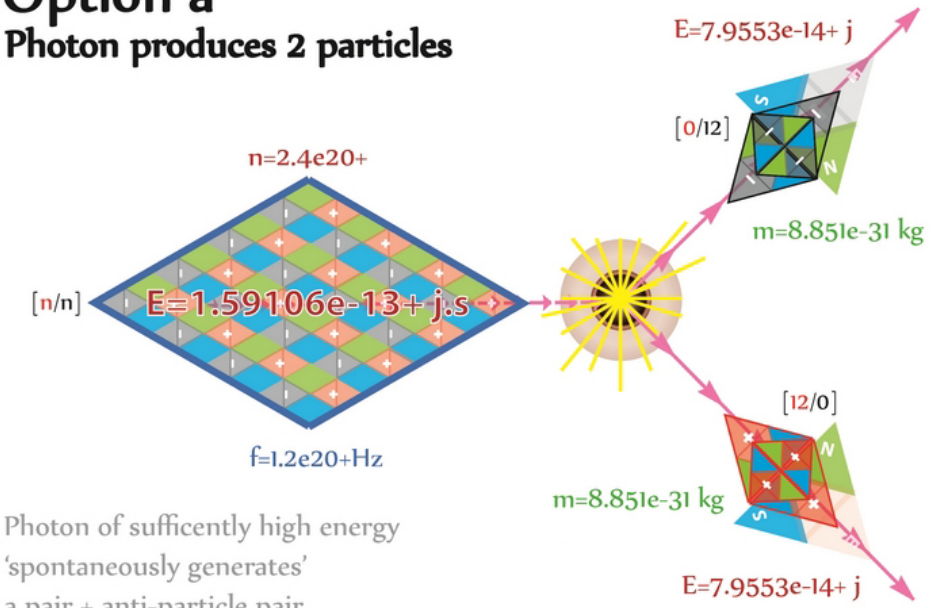
A photon with sufficient energy can be transformed into a real electron-positron pair.

The EM mass-Energy of the system is conserved as per Einstein's law of equivalence of mass and Energy.



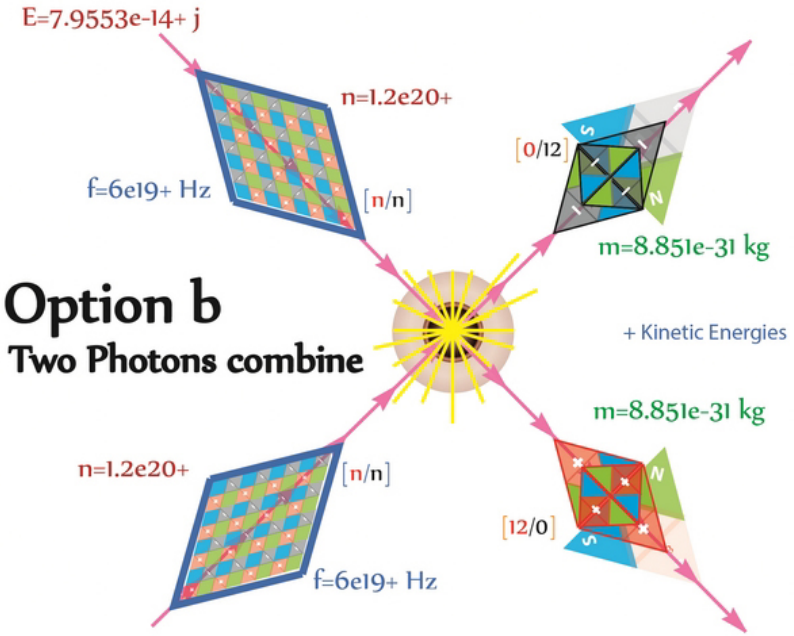
The photon's magnetic dipole and charges are also conserved (but in differing geometries)

Option a
Photon produces 2 particles



Photon of sufficently high energy 'spontaneously generates' a pair + anti-particle pair

Option b
Two Photons combine



c^4 c^2

Electron rest Matter	Energy	Photon frequency
8.8514860 e-31 kg	7.9553 e-14 j	6 e19

$$[mAv^2] = E = hf$$

Planck quanta; mass; velocity

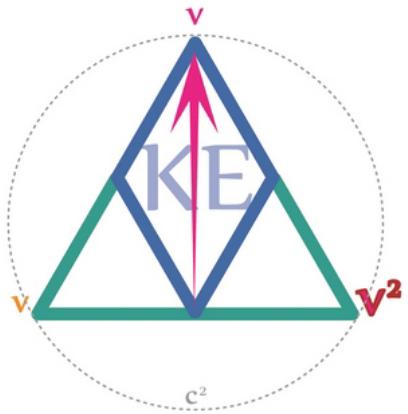
1.2 e20
Compton frequency

All pair production - annihilations follow the mass-Energy-Matter equivalency formula

Kinetic Energy

$$KE = \frac{1}{2}Mv^2$$

As velocity increases so does the number of energy momenta quanta



Photons contain
Kinetic Energy and Momentum

Photonic Energy

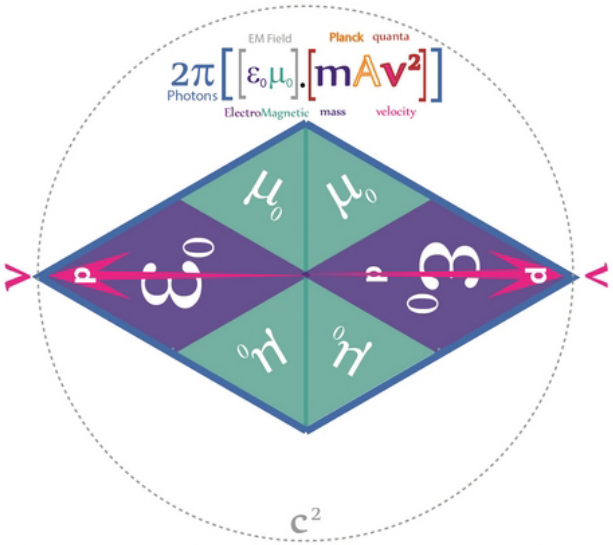
$$E_\gamma = 2\pi\left[\left[mAv^2\right]\right]$$

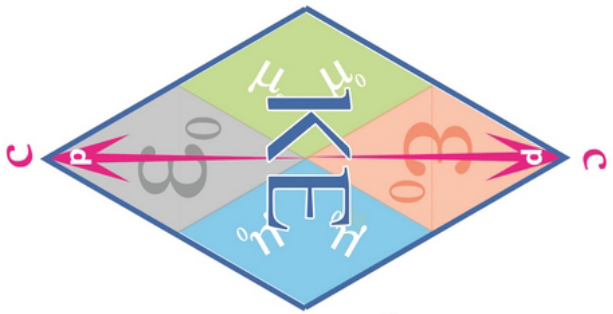
Planck quanta
mass velocity

Kinetic Energy and Momentum
are related through
Tetryonic geometry

Photons

$$p = \frac{h}{\lambda} = \frac{E}{c}$$





$$E = hf$$

Momentum

$$\frac{p^2}{2m} = KE = \frac{1}{2}Mv^2$$

As the number of Photons
increases so does the Momentum

$$p = n\pi\left[\left[mAv^2\right]\right] = E/v$$

Planck quanta
mass velocity
v

All Photons travel
at the 'speed of light'
in their medium of transmission

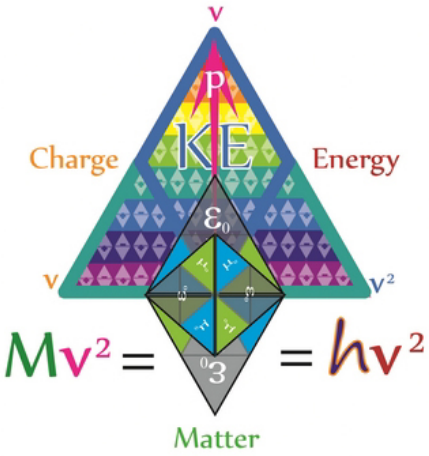
$$p = \frac{E}{c} = \frac{hv}{c} = \frac{h}{\lambda}$$

$$p = n\pi\left[\left[mAv\right]\right]$$

Planck quanta
mass velocity

Tetryonic energy-momenta

Photonic energy
from Tetryonic masses

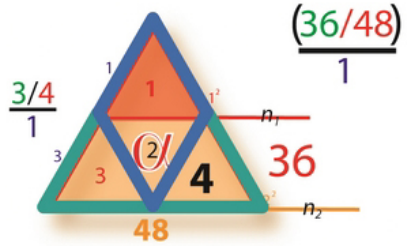


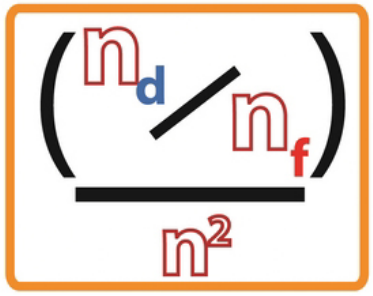
$$Mv^2 = {}^{0}3 = hv^2$$

Rydberg's formula is a re-expression of Lorentz's formula as it applies to the Quantised Energy momenta of Photo-electrons bound in atomic nuclei

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

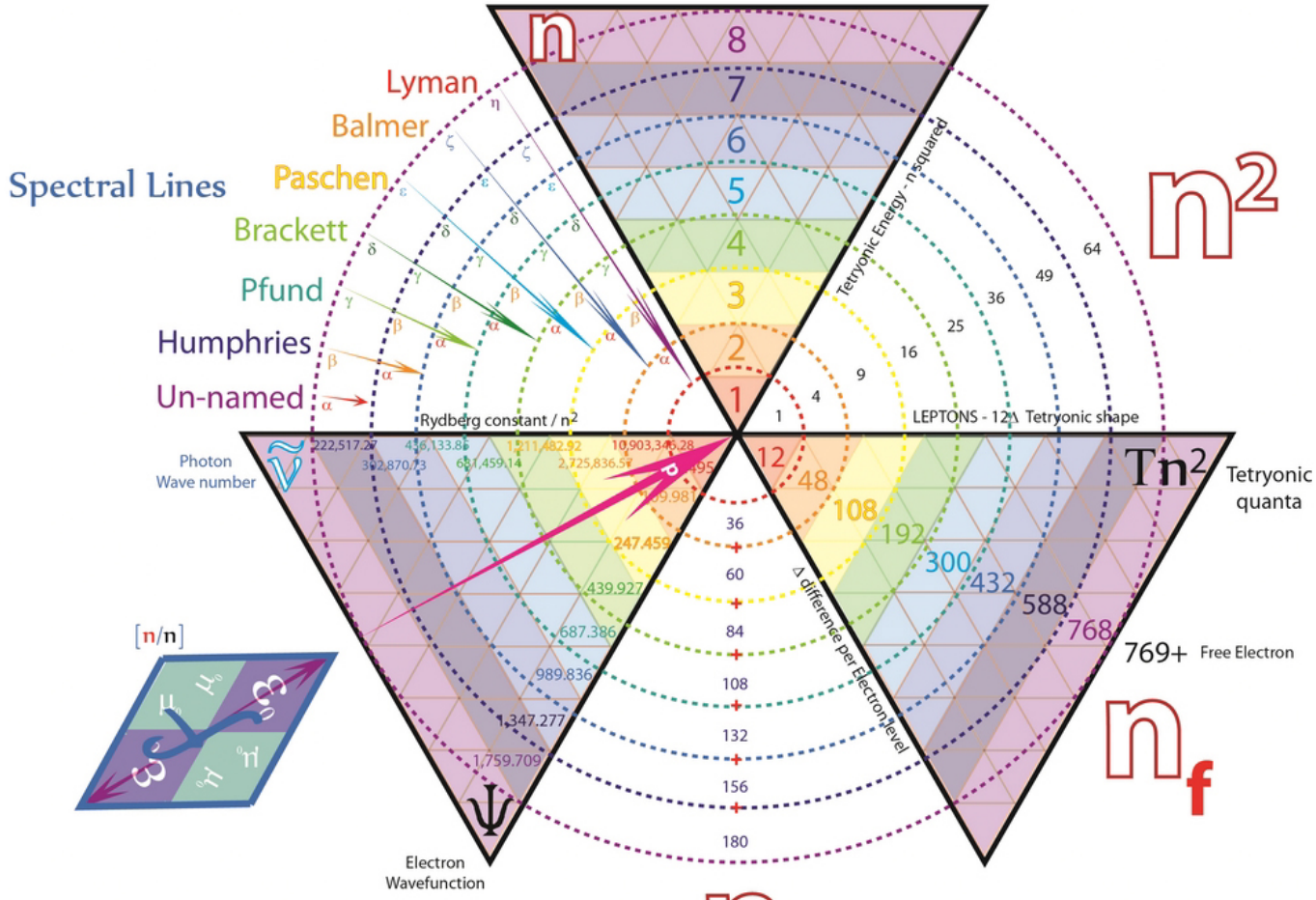
Rydberg: $R\left(\frac{1}{1} - \frac{1}{4}\right)_{.75}$ = LCD: $R\left(\frac{4}{4} - \frac{1}{4}\right)_{.75}$ = Tetryonic: $R\left(\frac{36/48}{1}\right)_{.75}$





Dividing the quantum level differential by the Final (or Inital) quantum state and again dividing the answer by the related emission/absorption spectral quantum level gives the Rydberg Constant multiplier.

This is the wavenumber of the emitted photon (inverse wavelength)



$$n_d = T\pi * (n_1^2 - n_2^2)$$

Photons

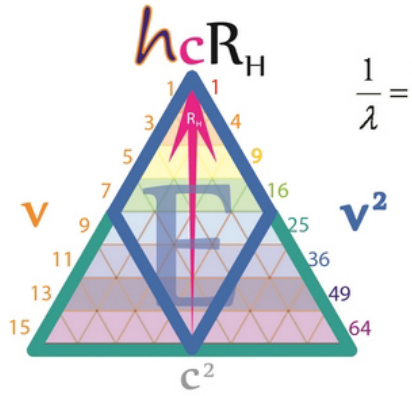
$$\frac{1}{2}Mv^2 = KE = hcR_H$$

Any changes to the Energy momenta of the electron's KEM field must be reflected in the Energy momenta of the Photo-electrons emitted [absorbed]

Quantum Level Differential

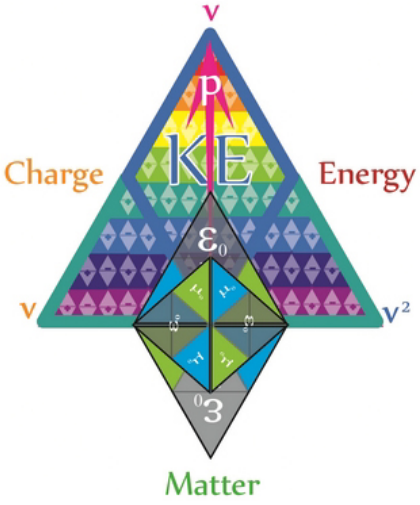
The exact number of Kinetic energy quanta (ZPFs) required for each electron transition within a Nucleus [Bosons]

$$n_d = (T\pi n^2) * (n_1^2 - n_2^2)$$



$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

Rydberg's Constant is a LINEAR measurement of the of the Lepton's KEM energies required (or released) in order to transistion between Electronic Quantum levels

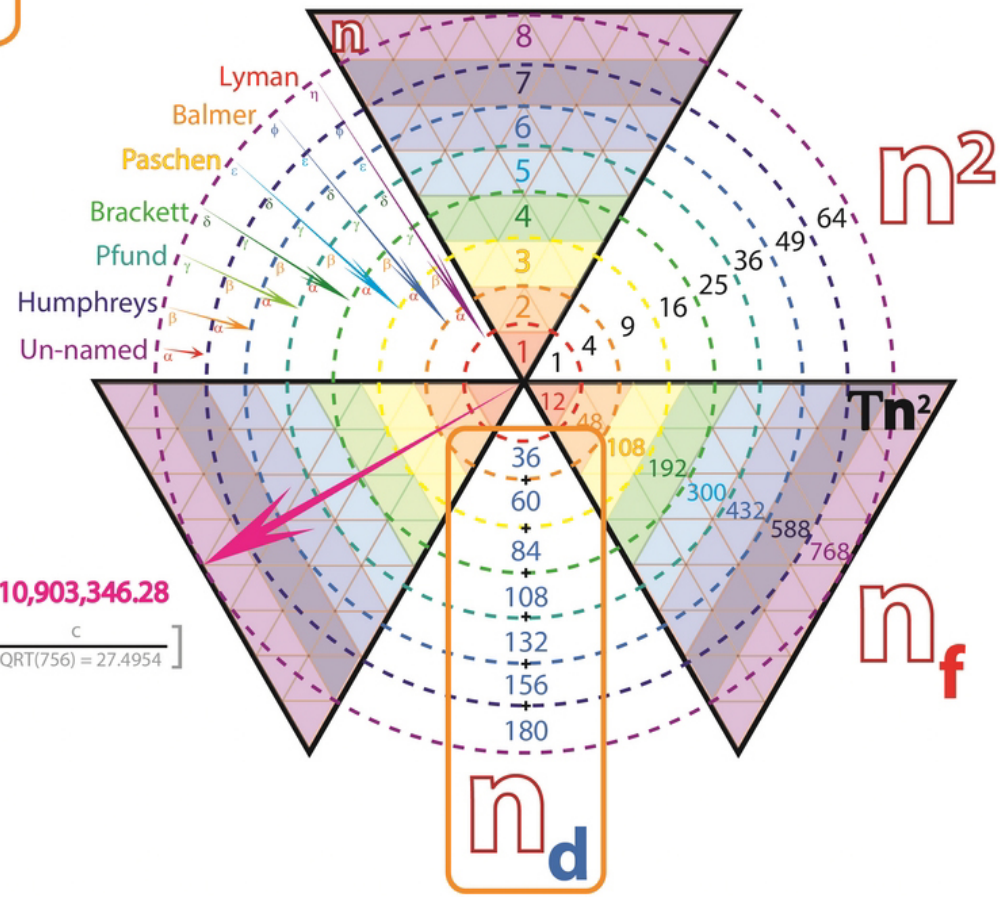


n_f

Each Quantum level jump within an Atomic Nuclei is discrete and requires an exact number of EM mass-Energy quanta

The calculation of the quanta required is historically done utilising Rydberg's Constant and its associated formula

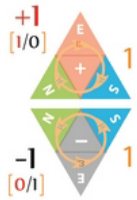
The Quantum level differential equates to the Tetryonic geometry [Matter] multiplied by the difference in Quantum levels n[Bosons]



Quantum Level Differentials

ZPF

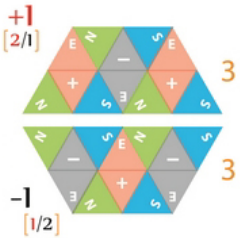
ZPF



Bosons are
Odd number
Charge carriers

W+

W-



$$1\pi \text{ Charge } \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$
EM Field · Planck quanta · ElectroMagnetic · mass · velocity

$$n.hv$$

$$\text{ODD}\pi \text{ Bosons } \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$
EM Field · Planck quanta · ElectroMagnetic · mass · velocity

All Leptons have
12 charge geometries

Each Quantum level change requires
Kinetic energy with an ODD number of
EM mass-Energy quanta
[Bosons - charge carriers]

In order to transistion between levels
for Emission and Absorption
each Lepton must release or absorb
W+ & W- Bosons (Z Bosons - Photons)
for each level change per fascia

Pairs of W Bosons combine to form
Photons / Z Bosons
[EM induction]

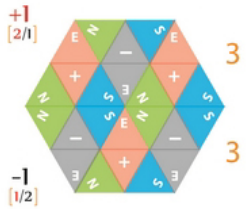
$$2\pi \text{ Photons } \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$
EM Field · Planck quanta · ElectroMagnetic · mass · velocity

$$n.hf$$

$$\text{EVEN}\pi \text{ EM waves } \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$
EM Field · Planck quanta · ElectroMagnetic · mass · velocity

γ

Photons are
Even number
EM force carriers

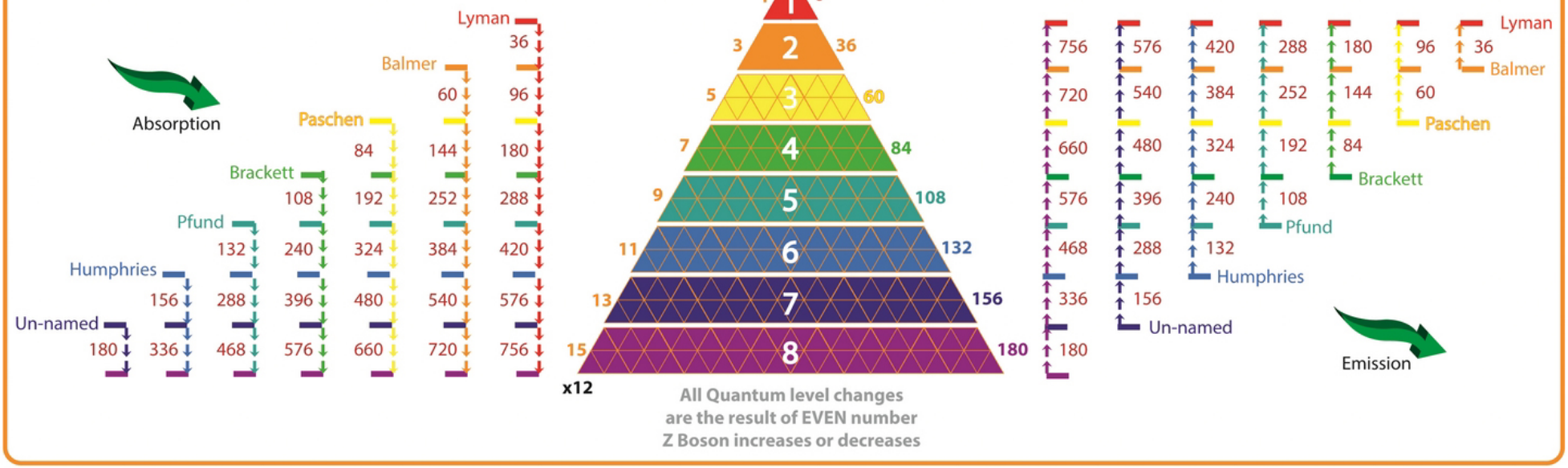


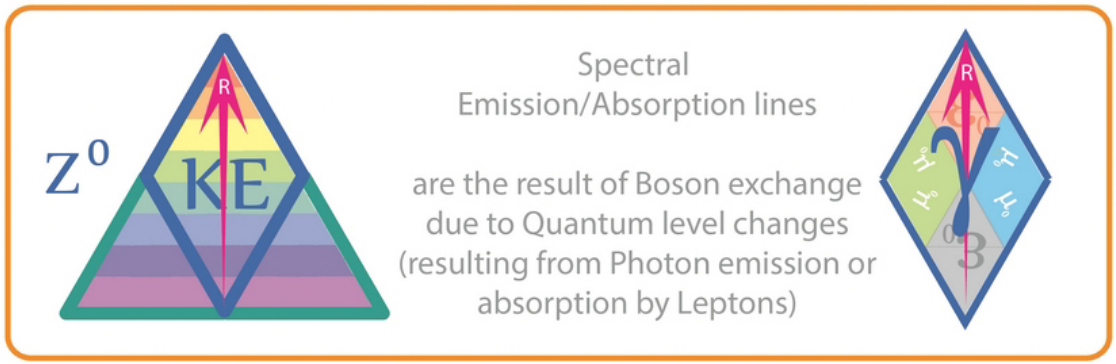
0
[3/3]

Z^0

Quantum Level Differentials

Bosonic Quantum levels in Leptons





The differing kinetic energies between each Spectral line series is determined by Rydberg's Constant

Quanta Differential	n1 [12]	n2 [48]	n3 [108]	n4 [192]	n5 [300]	n6 [432]	n7 [588]
36	α 36						
±							
60	β 96	α 60					
±							
84	γ 180	β 144	α 84				
±							
108	δ 288	γ 252	β 192	α 108			
±							
132	ε 420	δ 384	γ 324	β 312	α 132		
±							
156	ζ 576	ε 540	δ 480	γ 468	β 288	α 156	
±							
180	η 756	ζ 720	ε 660	δ 648	γ 468	β 336	α 180
	Lyman	Balmer	Paschen	Brackett	Pfund	Humphreys	Un-named

Kinetic Energies of Photoelectrons

rest Matter is invariant

Electron KEM Quantum levels

$$KEM = Mv^2$$

$$4\pi_{\text{KEM field}}\left[\left[\varepsilon_0\mu_0\right].\left[\underset{\text{mass}}{m}\underset{\text{velocity}}{Av^2}\right]\right]$$

EM Field (ElectroMagnetic) — Planck quanta

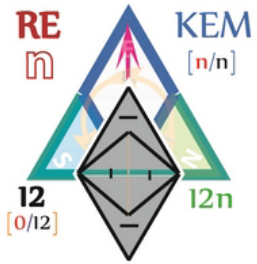
Kinetic Energy Levels

$$E = hf$$

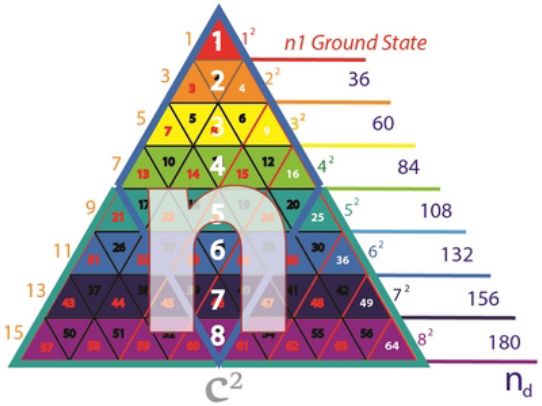
13.5252 eV
2.1669 e -18 J

6.62943 e -34 J.s

3.26874 e15 quanta



$1el9v = n$

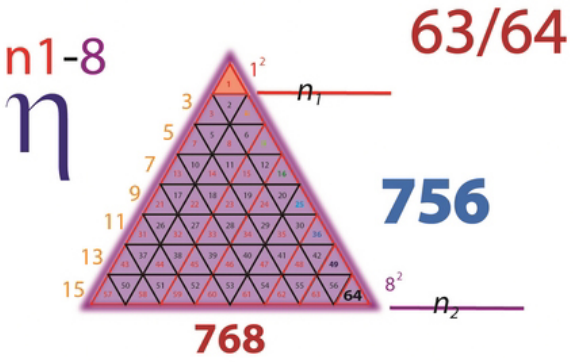


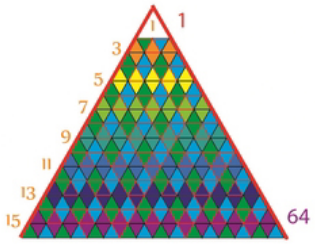
Electron	n total
1^2	12
α	48
β	108
γ	192
δ	300
ε	432
ζ	588
η	768
	n

Rydberg: $\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{64}\right)$ .984375

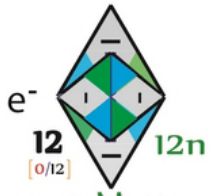
LCD: $= R\left(\frac{1}{1} - \frac{1}{64}\right)$ .984375

Tetryonic: $= R\left(\frac{63/64}{1}\right)$ .984375



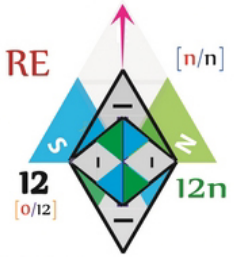


$2v = f$



rest Matter

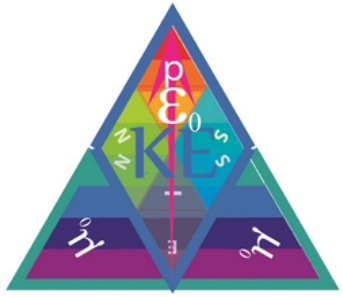
Kinetic energies are extended from Leptonic geometries



Relativistic mass-energies

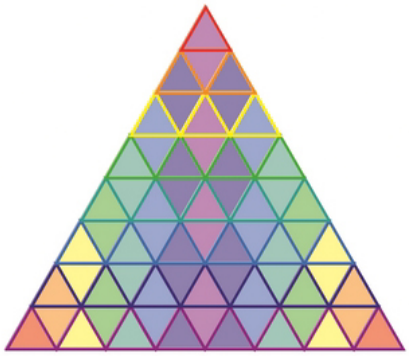
rest Matter + Kinetic Energies

The total energy of a photon is absorbed into the electron's KEM field



Increasing it's mass-Energy momenta [and its velocity]

EM waveforms



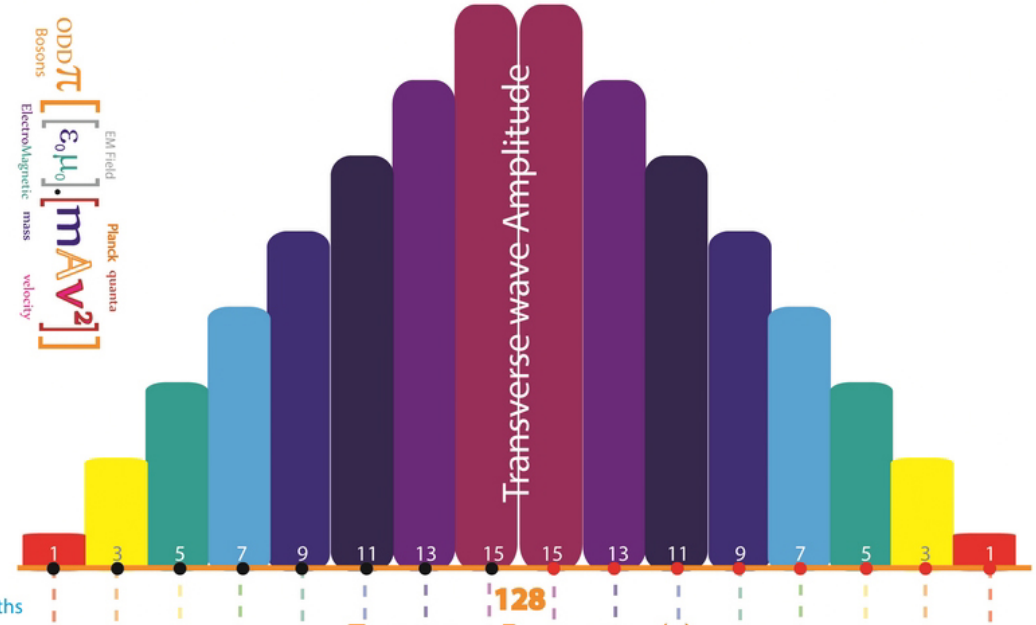
All EM waveforms can be measured
by either their Transverse EM masses [Bosons]
or their Longitudinal EM masses [Photons]

BOSONS

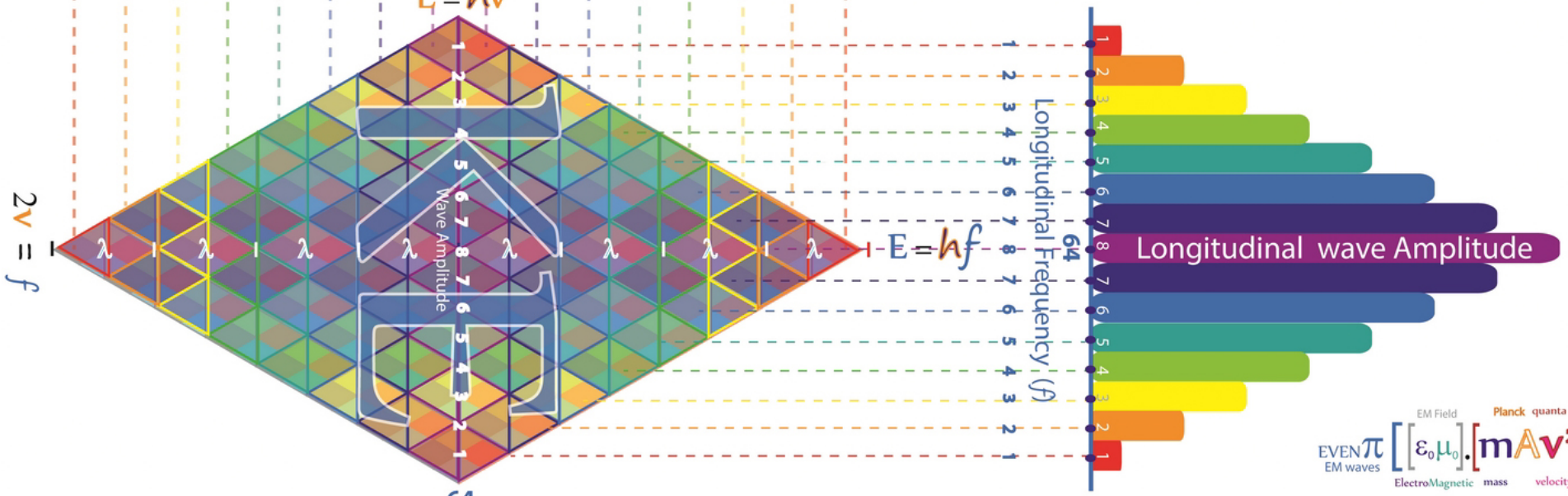
Bosons are transverse quanta

$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

Bosons · EM Field · ElectroMagnetic · mass · Planck quanta · velocity



PHOTONS



$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM waves · EM Field · ElectroMagnetic · mass · Planck quanta · velocity

Photons are longitudinal quanta

c ← Group Phase Velocity → c

$$E = mv^2$$

EM wavefunction

Probability of finding a Particle is the Square of the Amplitudes

In his 1926 paper, Max Born suggested that the wave function of Schrödinger's wave equation represents the probability density of finding a particle

The de Broglie-Schrodinger wave fields were not to be interpreted as a mathematical description of how an event actually takes place in time and space, though, of course, they have reference to such an event.

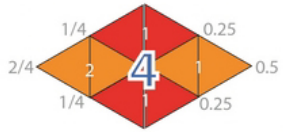
Rather they are a mathematical description of what we can actually know about the system. They serve only to make statistical statements and predictions of the results of all measurements which we can carry out upon the system.

(Albert Einstein, on Quantum Physics, 1940)

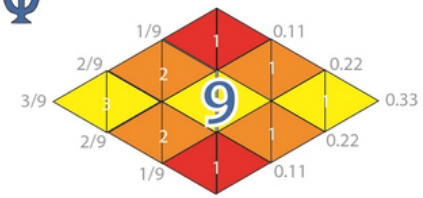
Probability = [Amplitude]^2

1 ψ 1/1

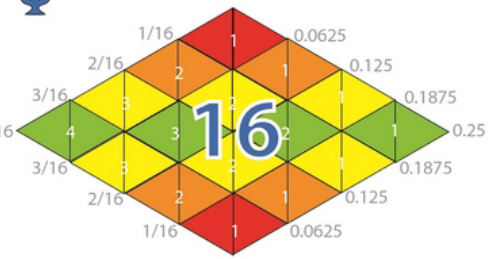
2 ψ 1/4



3 ψ 1/9



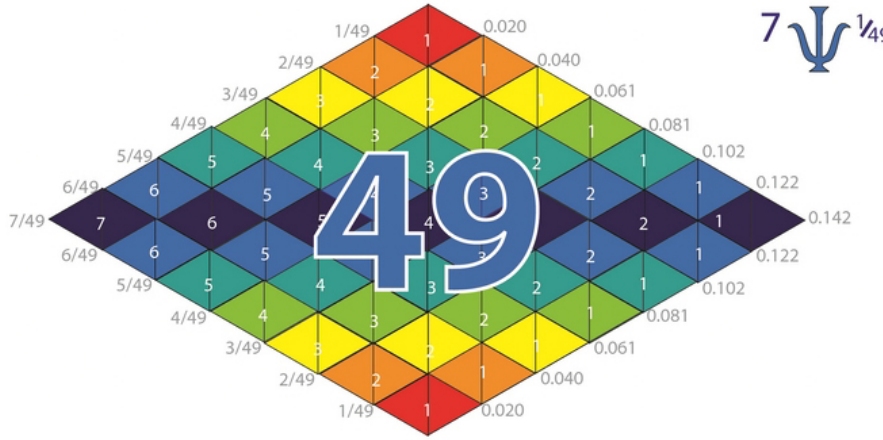
4 ψ 1/16



5 ψ 1/25

6 ψ 1/36

7 ψ 1/49



8 ψ 1/64

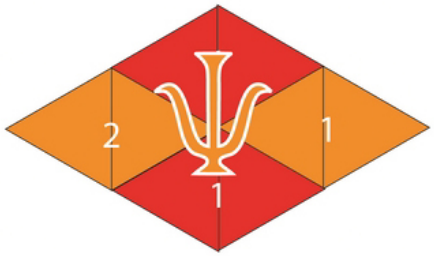
EM radiation patterns

The Wavefunction of EM waves predicts the distibution of EM mass-Energy within the wave

n1

1

n2

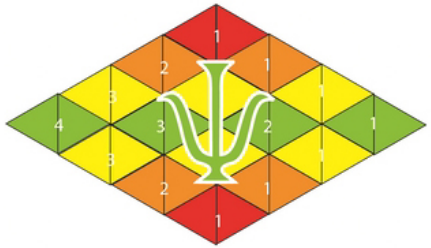


4

n3

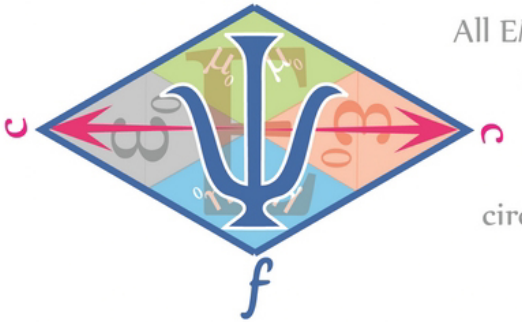
9

n4

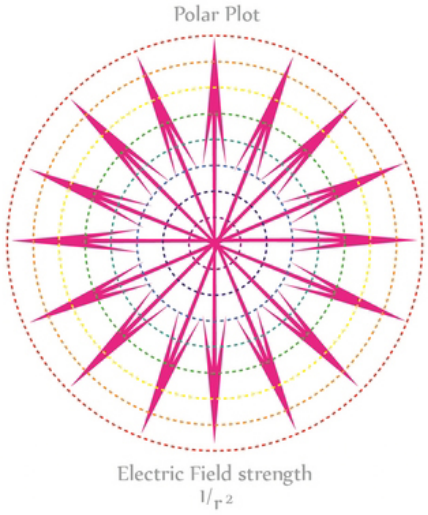


16

2v



All EM waves radiate outward at the speed of light along their E fields producing circular radiation patterns



$E = h\nu$

As the Energy of an EM wave increases so does the frequency

$E = hf$

n5

25

n8

64

n7

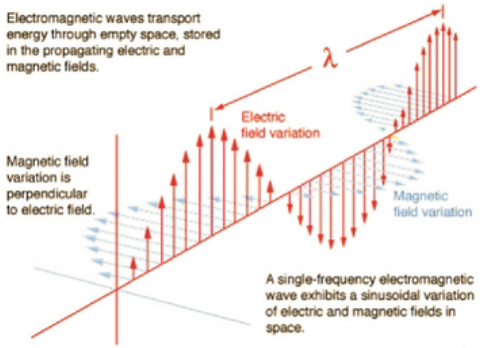
49

n6

36

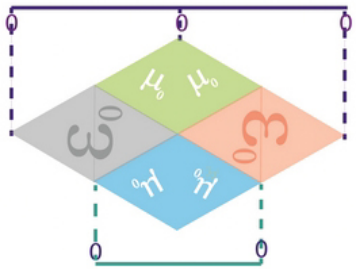
As the Energy and frequency increase, the Wavelengths of the Photons in a EM wave decreases

EM wave geometry

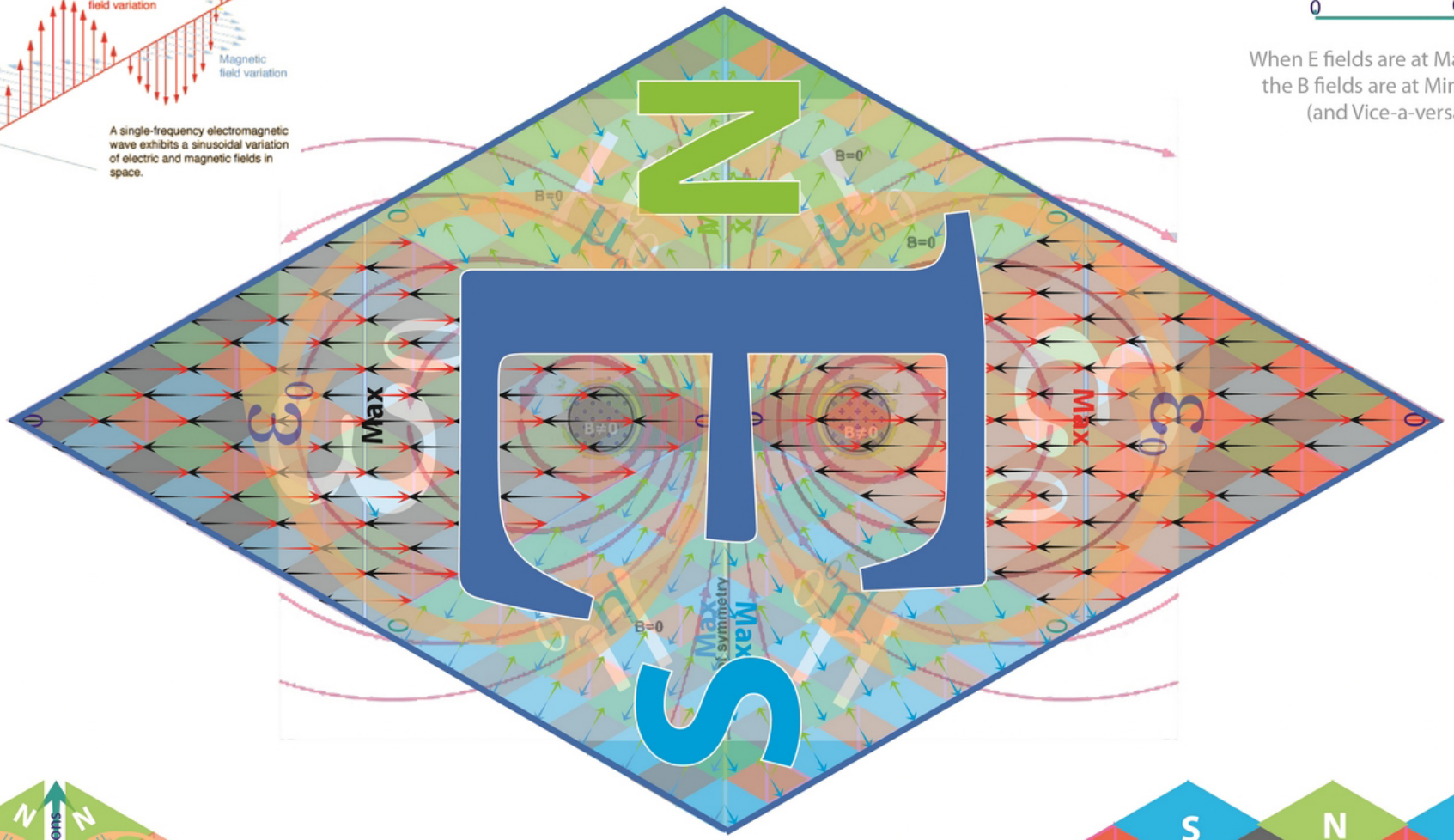


$E = h\nu$

Bosons



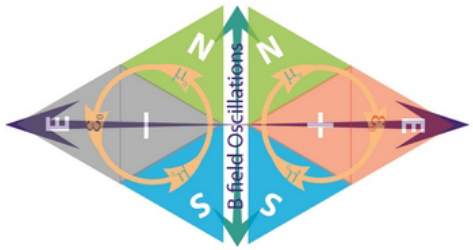
When E fields are at Maximum
the B fields are at Minimum
(and Vice-a-versa)



$2v = f$

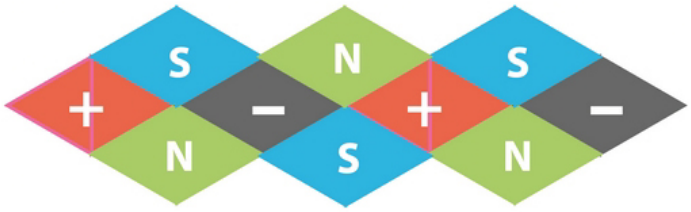
$E = hf$

Photons

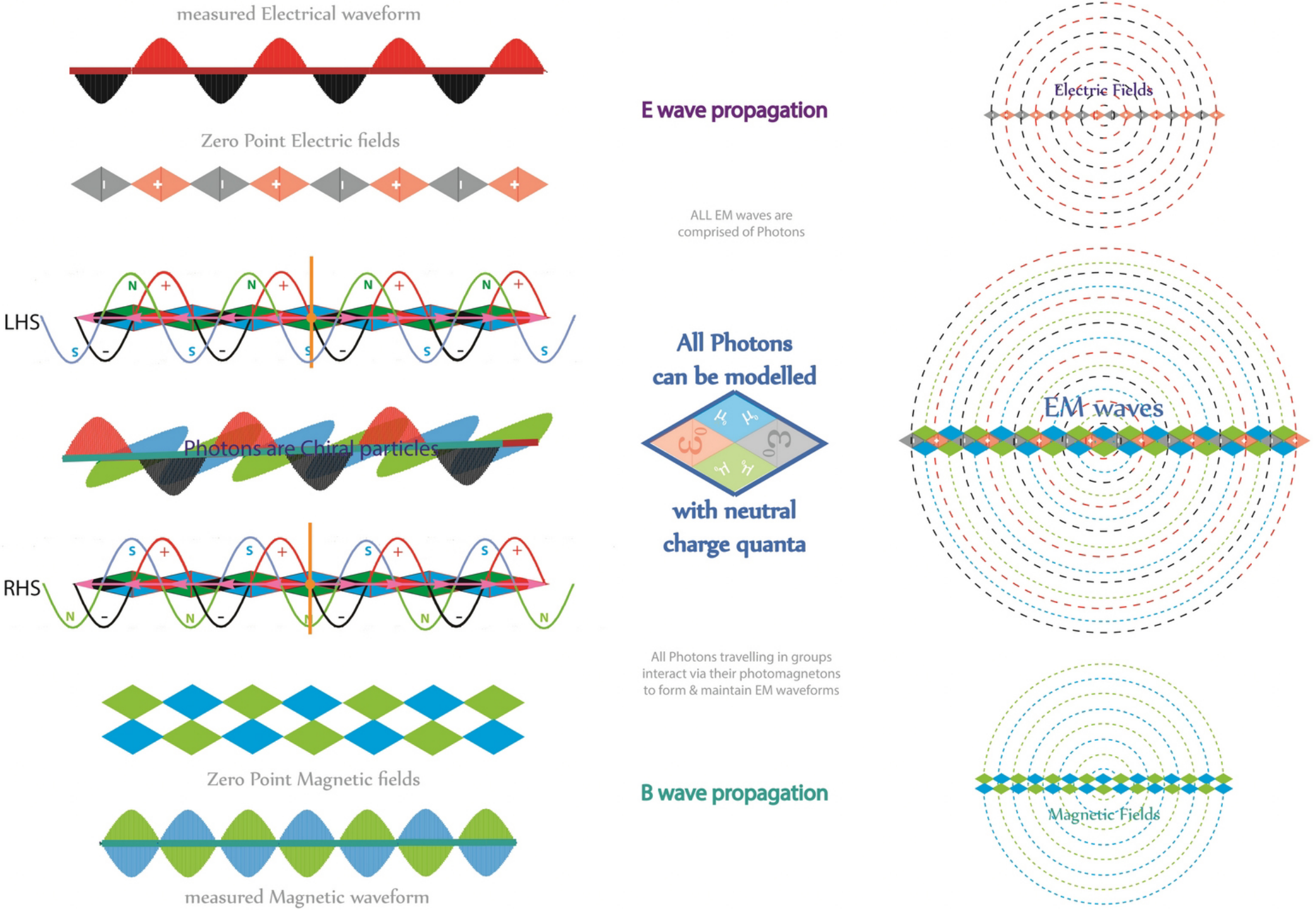


E Field oscillations

$E = mc^2$



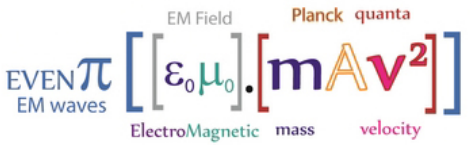
As the E field reverses polarity
the B field reverses its dipole orientation


measured Electrical waveform
Zero Point Electric fields
LHS
Photons are Chiral particles
RHS
Zero Point Magnetic fields
measured Magnetic waveform
E wave propagation
ALL EM waves are
comprised of Photons
All Photons
can be modelled
with neutral
charge quanta
All Photons travelling in groups
interact via their photomagnetons
to form & maintain EM waveforms
B wave propagation
Electric Fields
EM waves
Magnetic Fields

ElectroMagnetic waveforms

are the geometries form by Electric and Magnetic waves as they move through external fields in a particular direction of propagation

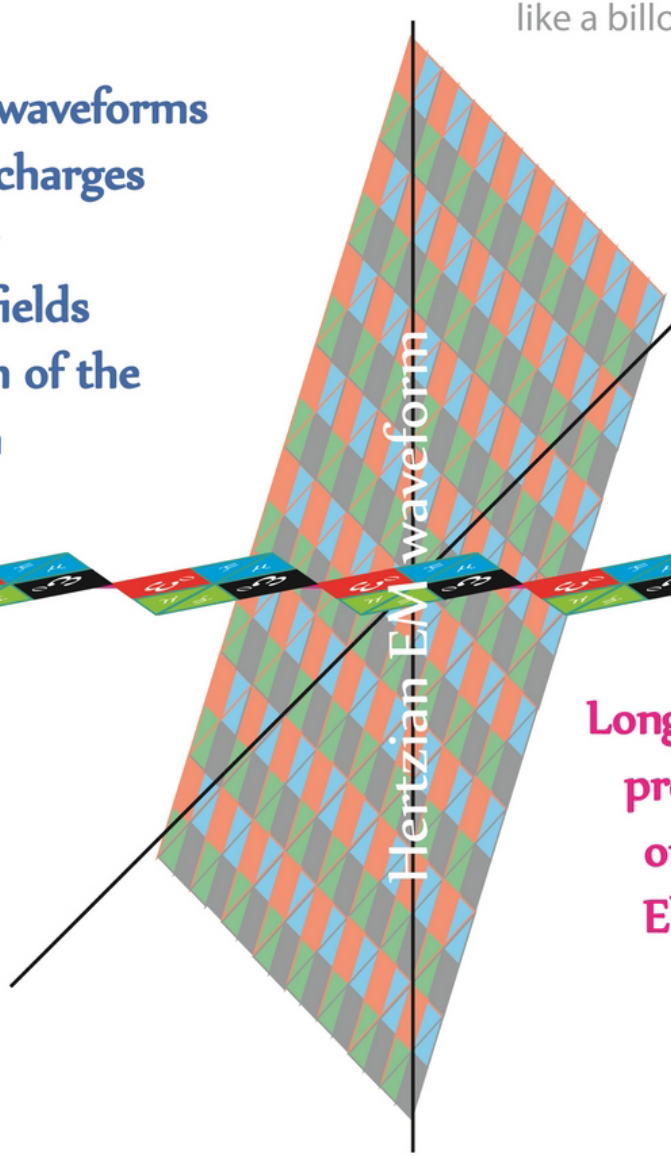
Transverse waves present their full inductive fascia to the external EM fields like a billowing ship's sail



Transverse EM waves are the waveforms produced by accelerating charges and they have their Electric and Magnetic fields orthagonal to the direction of the wave's propagation

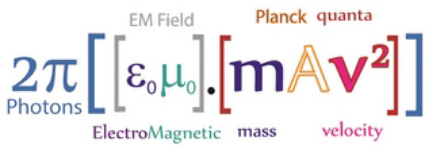
Transverse 'Hertzian' waves should be termed 'bosonic waves' and are limited to the speed of Light due to their presenting the maximum surface area possible

Teslian EM waveform



Longitudinal EM waves are the waveforms produced by spark gaps and they have orthagonal Magnetic fields and their Electric field is in the same direction as the wave's propagation

Longitudinal 'Teslian impulse' waves should be termed 'action-at-a-distance' as their energy momenta line up in the direction of travel to form a stiff rod of momentum



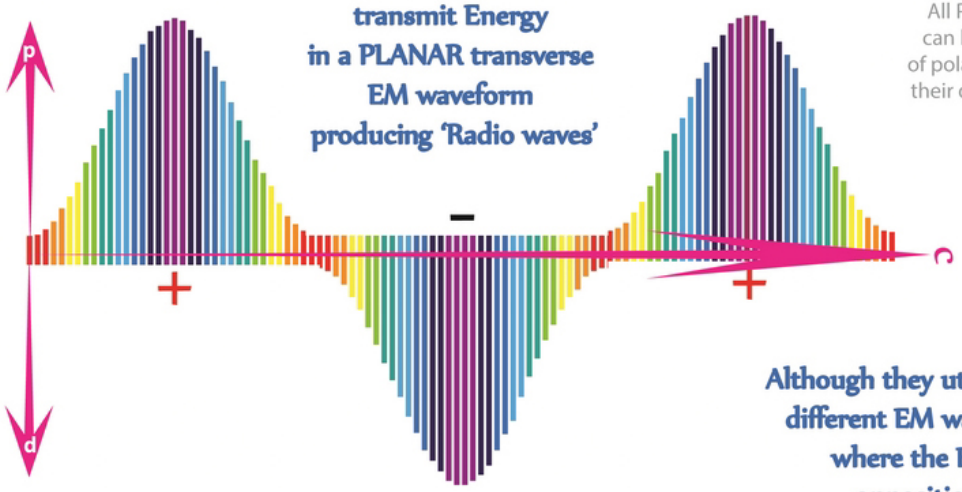
Tesla argued long and hard trying to draw attention to the distinctions between these 2 forms of EM radiation

Longitudinal waves 'slice' through external EM fields with their Energy momenta aligning like a sharp knife

ElectroMagnetic waveforms

The E and H fields are perpendicular to the direction of propagation

Hertzian waves transmit Energy in a PLANAR transverse EM waveform producing 'Radio waves'

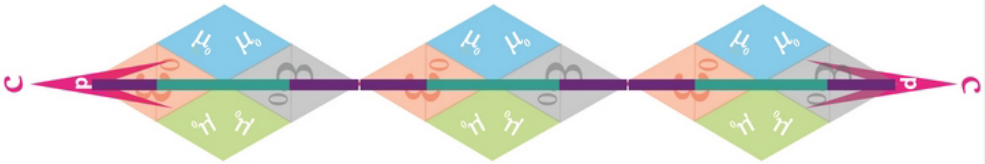


In 1887, Heinrich Hertz demonstrated the reality of Maxwell's electromagnetic waves by experimentally generating radio waves in his laboratory

All Photons and EM waves can have various directions of polarisation with respect to their direction of propagation

Although they utilise the same EM energies, different EM waveforms can be produced where the Electric fields are in 90° opposition to each other thus leading to conflicting theories of EM wave propagation

Teslian waves transmit Energy in a LONGITUDINAL waveform producing 'Action at a Distance'



The E fields are co-linear with the direction of propagation

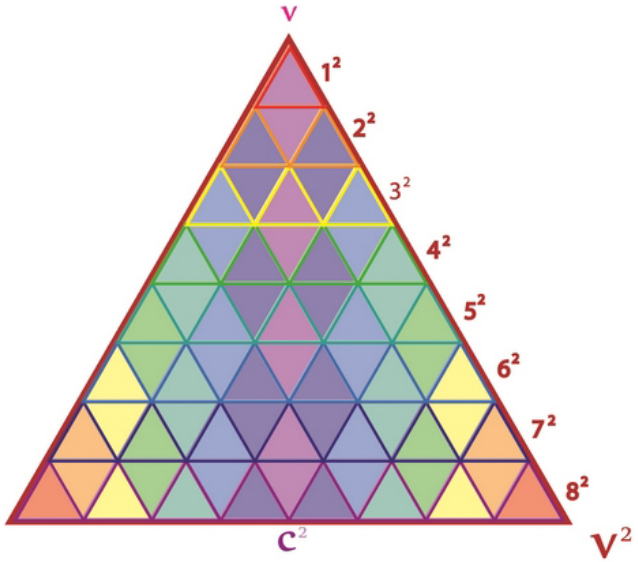
Through longitudinal waves, Tesla transferred energy to receiving devices. He sent electrostatic forces through the air, transferred electrical energies and noted the lethal forces produced by these waves

Heinrich Hertz

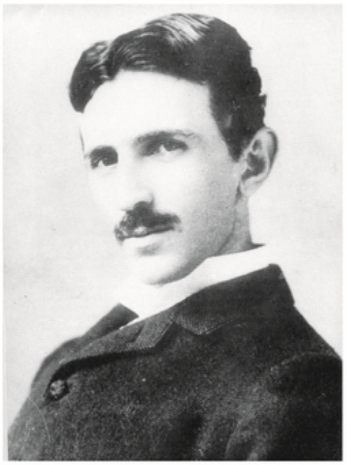
(22 Feburary 1857 - January 1 1894)

f

Cycles per Second



Nikola Tesla



(10 July 1856 – 7 January 1943)

V

Volts per Second

Soon after Hertz's claim of discovering Maxwell's transverse EM waves Tesla visited him and personally demonstrated the experimental error to him. Hertz agreed with Tesla and had planned to withdraw his claim, but varying agendas intervened and set the stage for a major rift in the 'accepted' theories that soon became transformed into the fundamental "laws" of the electric sciences that have held sway in industry and the halls of academia to the present day

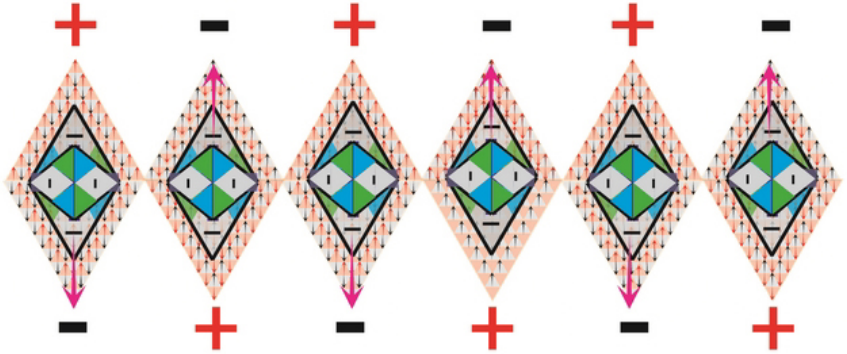
ElectroMagnetic waves

Separated charges produce electromotive forces [voltage]

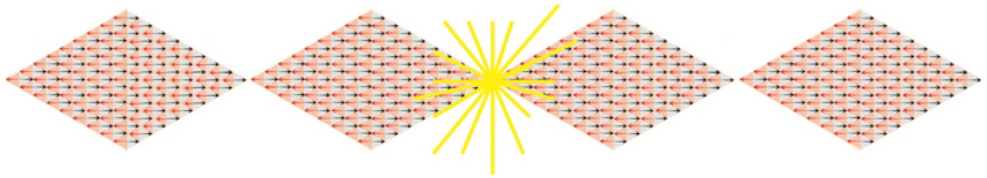
EM waves can be Transverse or Longitudinal with respect to their direction of propagation

It is now clear [using Tetryonic geometry] that both Maxwell and Tesla were correct in their opposing theories of EM waveforms with Maxwell proposing Transverse waves and Tesla proposing Longitudinal waves.

**The differing opinions on the EM waveforms is shown to be a direct result of the sources of EM wave generation employed .
Hertz used oscillating Charges to produce Transverse [planar] waves while Tesla continued used Spark gaps to produce Longitudinal waves**



Maxwell - Hertz



Tesla

Accelerating charges
produce
Transverse EM waves

Spark Gaps & Plasma discharges
produce
Longitudinal EM waves

Transmitter

Hertzian radio waves

Action-at-a-Distance

Reciever

Soon after Hertz's claim of discovering Maxwell's transverse EM waves Tesla visited him and personally demonstrated the experimental error to him.
Hertz agreed with Tesla and had planned to withdraw his claim, but varying agendas intervened and set the stage for a major rift in the 'accepted' theories
that soon became transformed into the fundamental "laws" of the electric sciences that have held sway in industry and the halls of academia to the present day

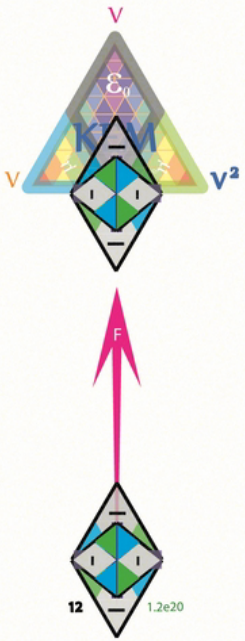
Transverse EM wave production

Alternating the Voltage potentials in an Electrical circuit produces an Alternating Current
of electrons with Kinetic EM energies reflective of the Time-Energy duration of the AC circuit

**Any change to the momentum of a charged particle in motion
requires a corresponding quantum level energy-momentum change through the
emission/absorption of quantised EM mass-ENERGY momenta in the form of bosons**

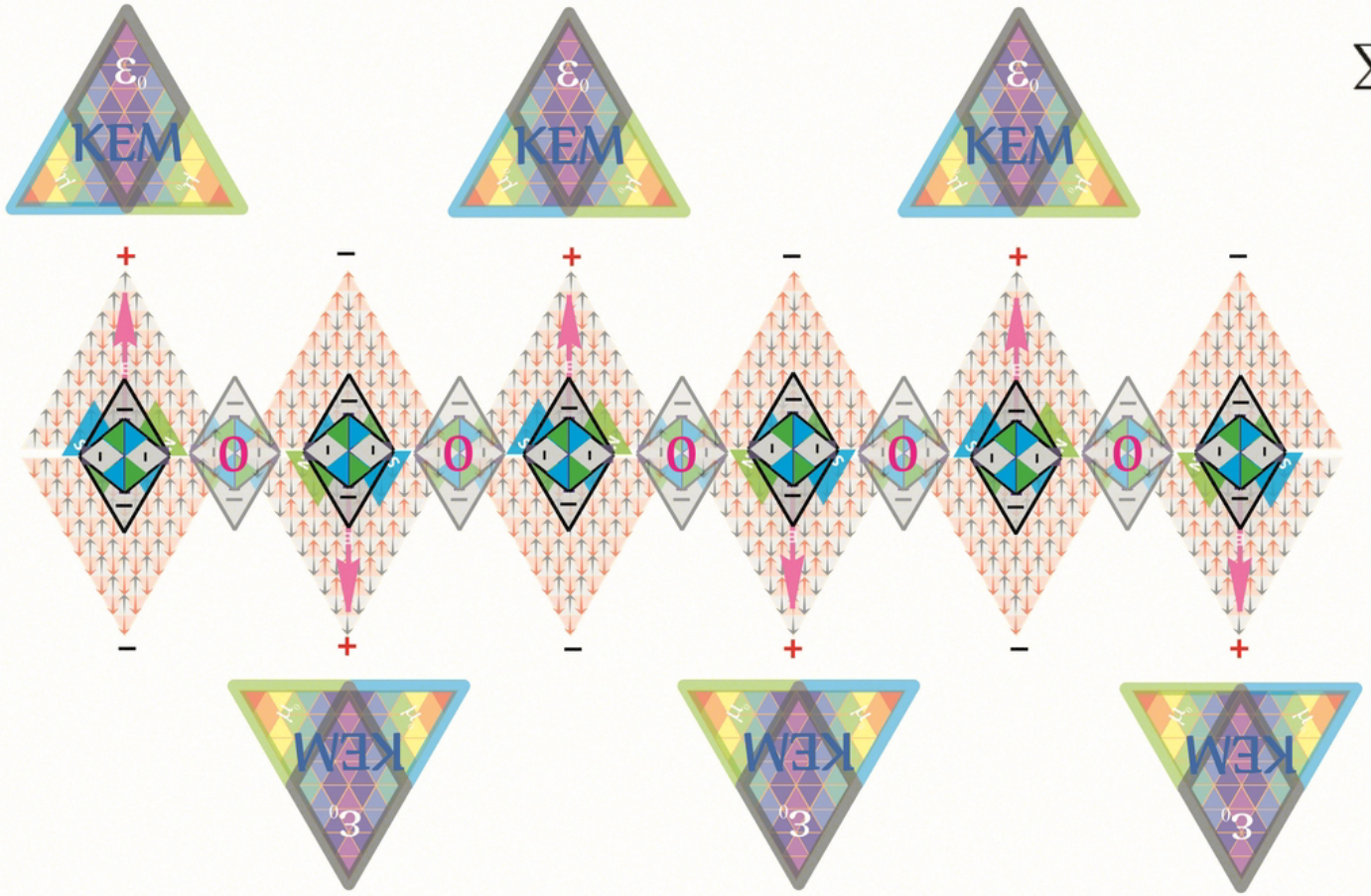
Kinetic Energies from Motion
(Diverge from rest Matter)

Kinetic
Matter



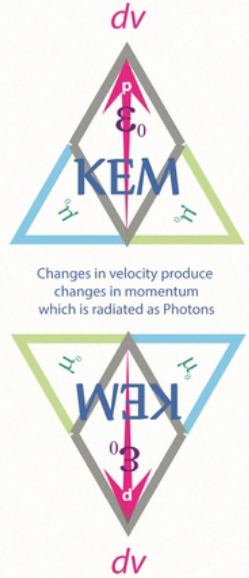
rest
Matter

All Stationary charged particles have
NO Magnetic moments (intrinsic dipoles)
ie. They are Electro-static



$$F=ma$$

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$



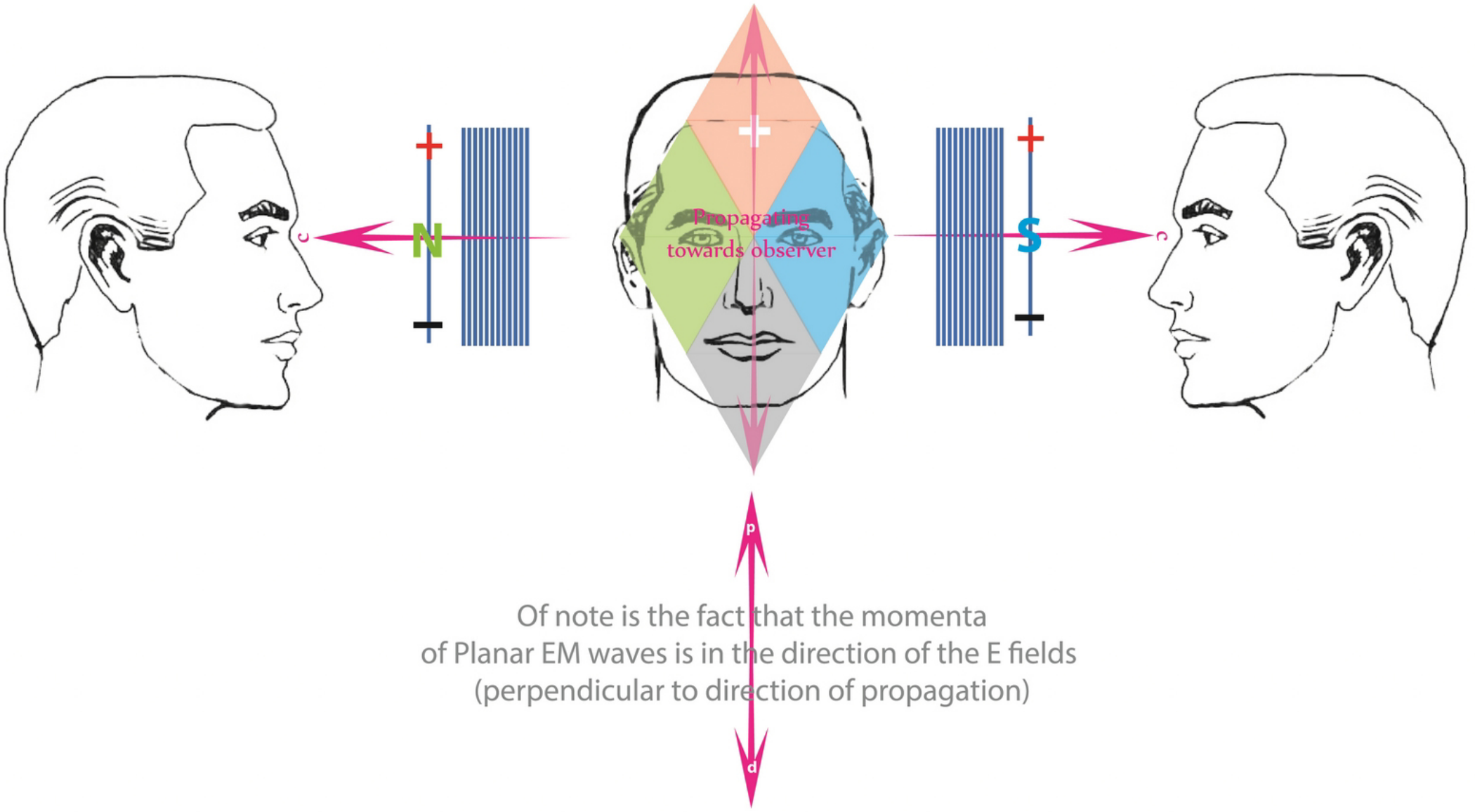
Charges with constant velocities
produce
REACTIVE [K]EM FIELDS

**Alternating Voltages provide an electromotive force to Electrically charged Particles
producing tranverse Kinetic Energy fields with orthagonal Magnetic fields**

Accelerating Charges
produce
RADIANT EM WAVES

Transverse [Planar] EM waves

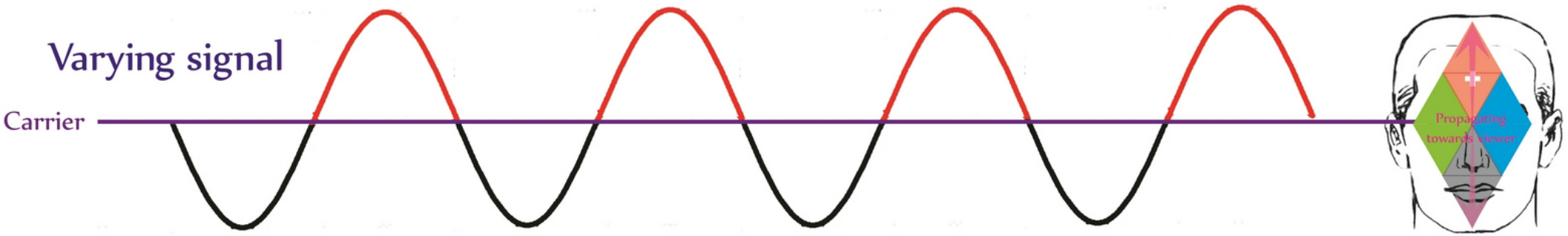
EM waves (whether AM or FM modulated)
are comprised of Planar EM fields propagating
orthagonally to the E & M field directions

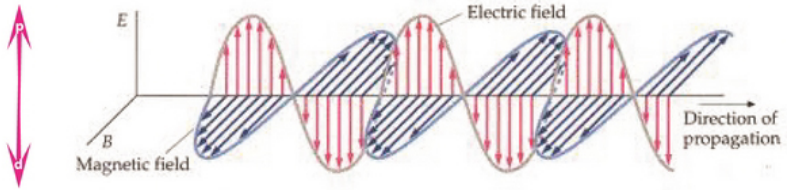


Of note is the fact that the momenta
of Planar EM waves is in the direction of the E fields
(perpendicular to direction of propagation)

AM waveform

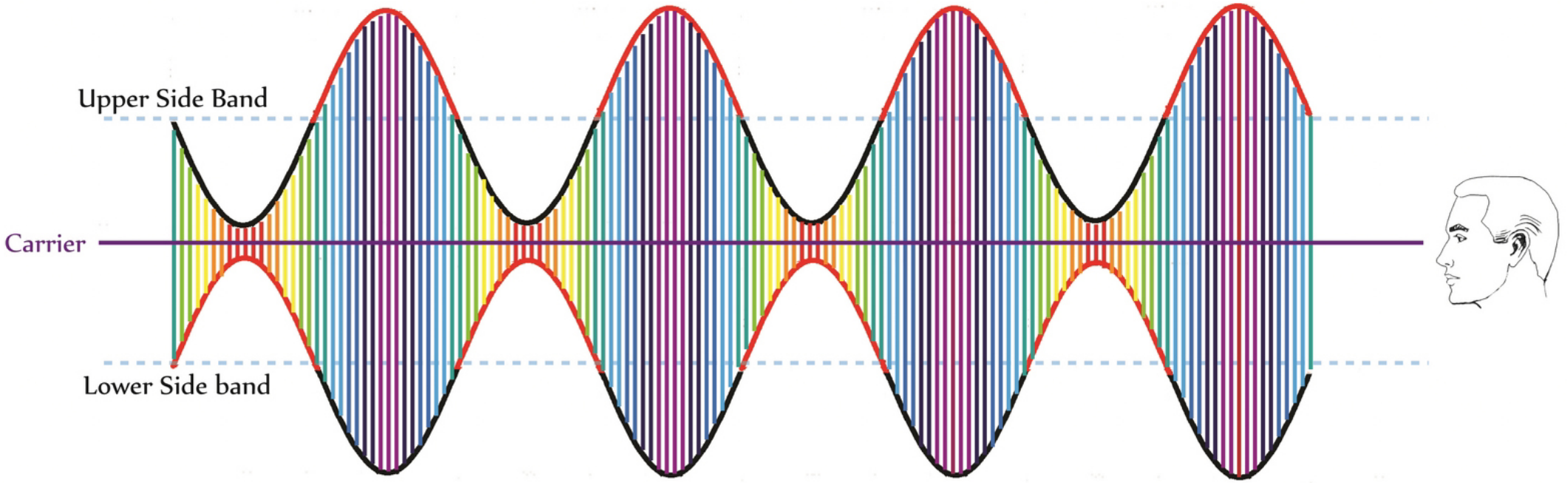
Amplitude Modulation (AM) works by varying the strength of the transmitted signal in relation to the information being sent.





Maxwellian Transverse Planar EM waves

(of varying energy levels)

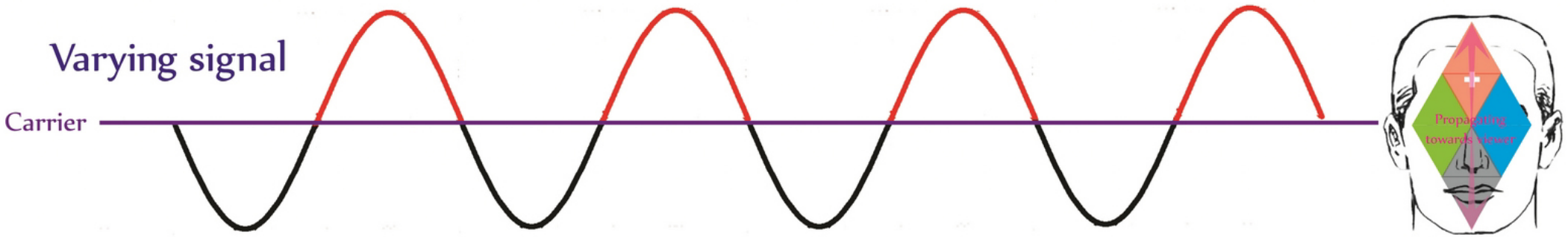


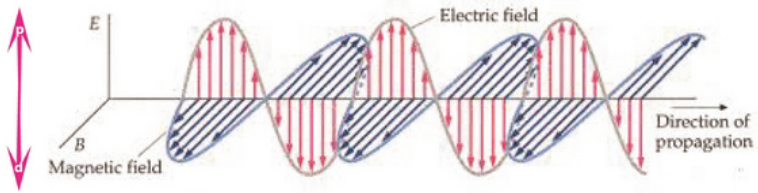
Note: Transverse EM waves have Electric fields perpendicular to direction of proagation

FM waveform

Frequency modulation (FM) is a form of modulation which conveys information over a carrier wave by varying its frequency (in contrast with amplitude modulation, in which the amplitude of the carrier is varied while its frequency remains constant).

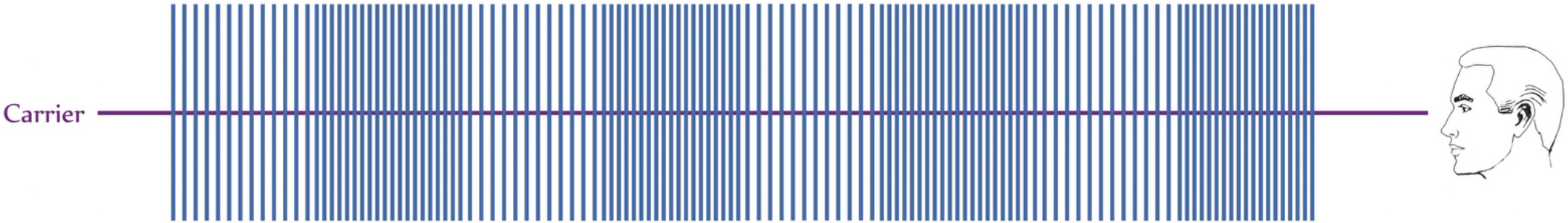
In analog applications, the instantaneous frequency of the carrier is directly proportional to the instantaneous value of the input signal





Maxwellian Transverse Planar EM waves

(of the same frequency levels)



Note: Transverse EM waves have Electric fields perpendicular to direction of propagation

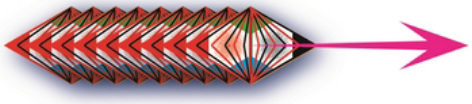
Transverse wave polarisation

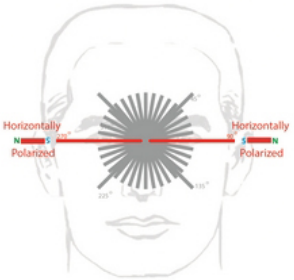
Transverse waves are inefficient propagators of EM energy as they present their full reactive [inductive] fascia geometries to the external EM fields that they move through, this combined with their momenta being directed orthagonally to their direction of propagation means they radiate their EM energies quickly and do not interact like longitudinal waves.

Transverse waveforms

Transverse Photons & EM waves are produced by accelerating/oscillating charges

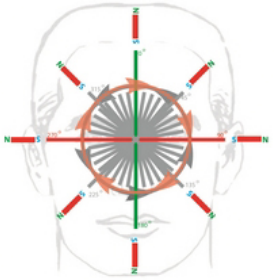
Horizontally polarised





E field is aligned along a Horizontal axis

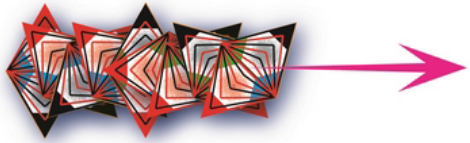
Circularly (or Elliptically) Polarised

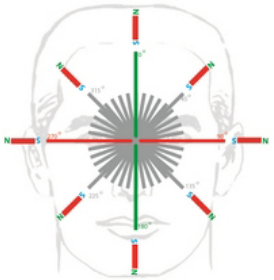


E field has an alignment that follows a circular pattern (Clockwise or Counter-clockwise)

By convention, the polarization of light is described by specifying the orientation of the wave's electric field at a point in space over one period of the oscillation

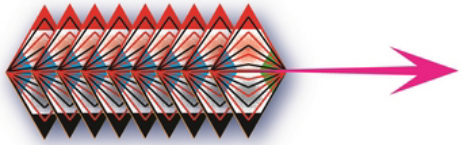
Un-Polarised

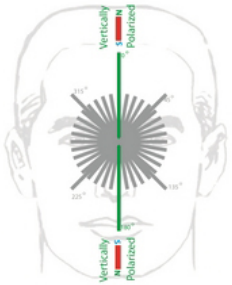




E field has NO preferential axial alignment (and can arrive at any angle)

Vertically Polarised



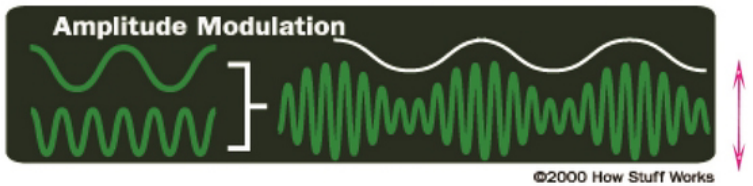


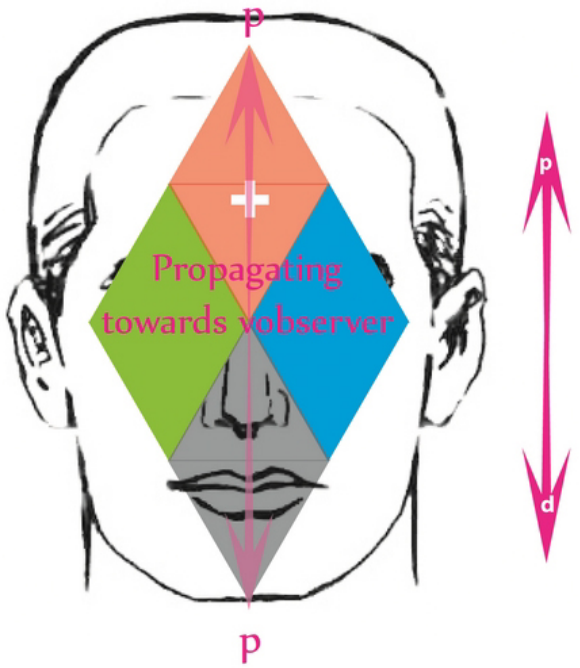
E field is aligned along a Vertical axis

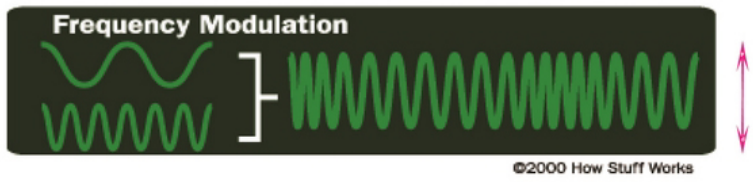
Transverse EM waves have their E&M fields orthagonal with their direction of propagation

Examples of transverse waves include seismic S (secondary) waves, and the motion of the electric (E) and magnetic (M) fields in an electromagnetic plane wave, which both oscillate perpendicularly to each other as well as to the direction of energy transfer.

Transverse vs. Longitudinal EM waves

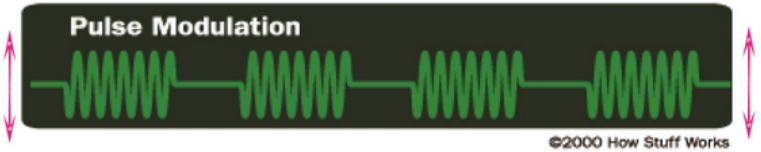


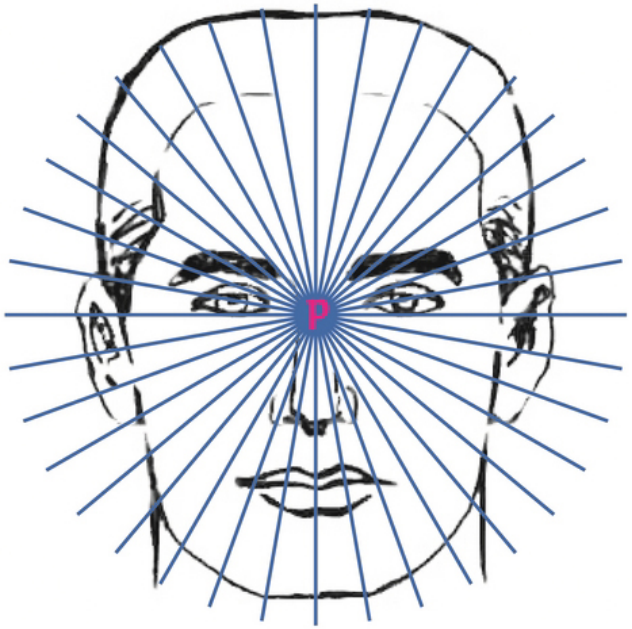




In addition to planar Maxwellian waves
there exists Longitudinal EM waves

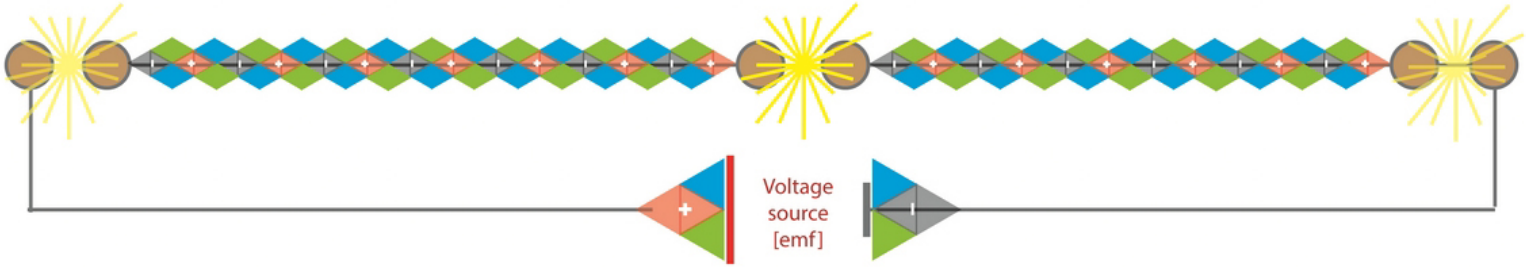
Not to be confused with Pulsed planar waves





As the Frequency of Longitudinal waves increases
the Energy-Momenta increases and wavelength decreases
providing the mechanical force basis for 'Action at a Distance'

Producing Longitudinal EM waves



There are two ways to produce longitudinal EM waves
[the short circuiting of voltage potentials or spark gap discharges of electrical energy]

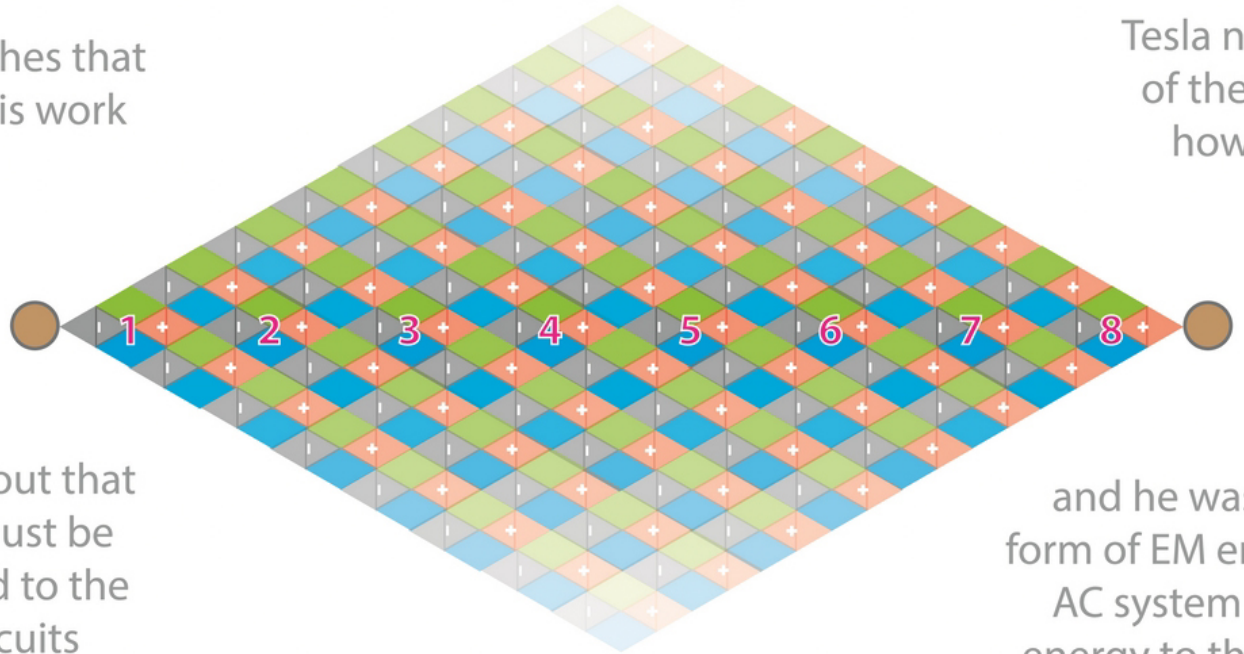
High frequency discharges

Very large Voltages

These are the approaches that Nikola Tesla took in his work

Tesla noted the deadly power of the spark discharges and how they 'stung his face'

The orthagonal Magnetic fields of Longitudinal waves produce reactive inductance fields



The Electric fields of Longitudinal waves produce lines of force

He strove to point out that the load circuits must be inductively coupled to the transmission circuits

and he was convinced that this form of EM energy would replace his AC system and provide wireless energy to the World without losses

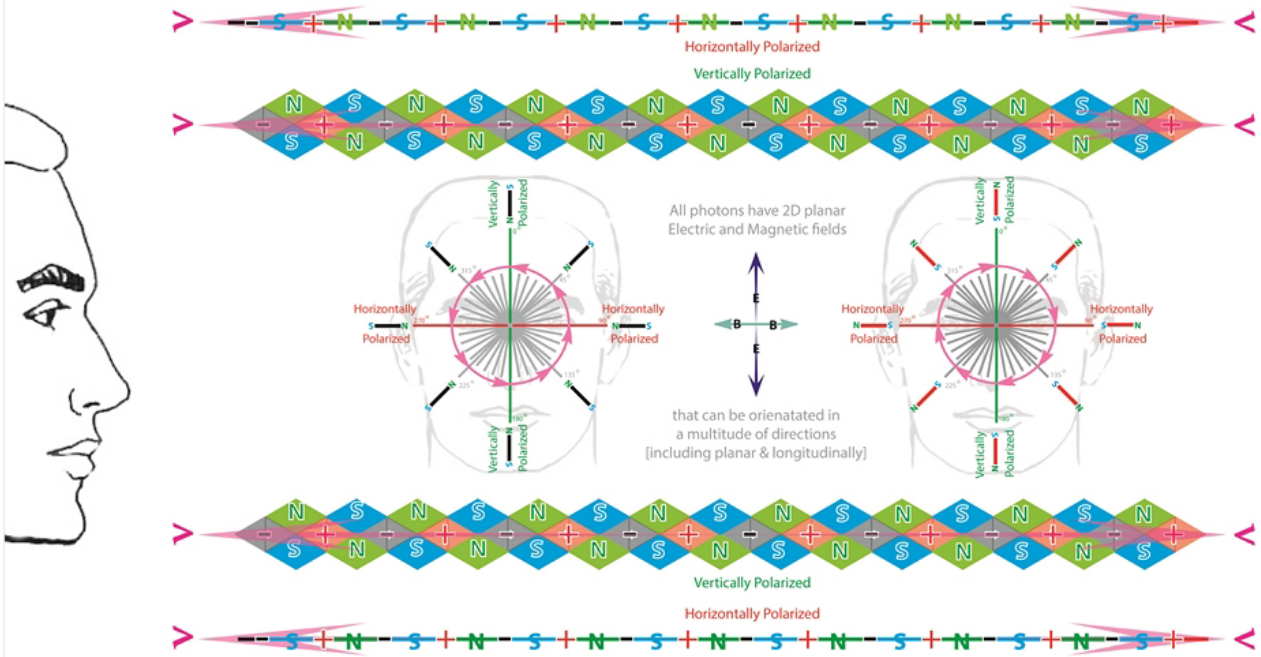
or a combination of the two

Longitudinal wave polarisation

Maxwell's equations lead to the prediction of transverse electromagnetic waves in a vacuum,
(whose Electric fields and Magnetic fields vary perpendicularly to the direction of propagation).

However, longitudinal EM waves [with their Energy momenta aligned in the direction of travel]
can also be created like the EM energies radiated by Stars or spark gap technologies

Longitudinal Photons & EM waves are produced
by spark gap transmissions & plasma technologies



The longitudinal alignment of E field momenta with their direction of propagation
facilitates velocities faster than the speed of light to be acheived if sufficient energies are inputted

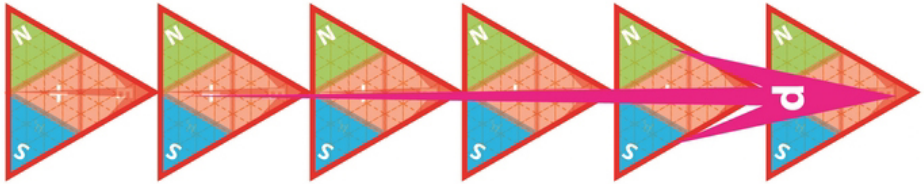
‘Action at a Distance’

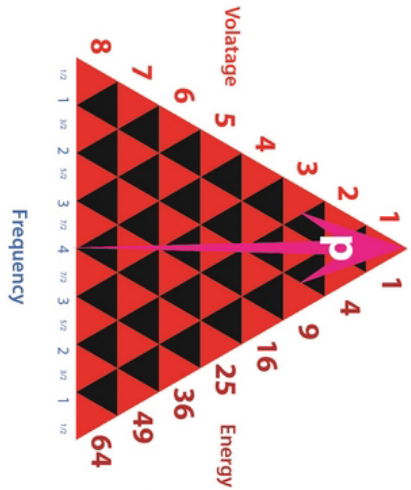
a source of mystery since it was first proposed by Newton
as the basis for Gravitational attraction can be
explained with Teslian Longitudinal waves

The ability of one source to affect the other depends on their respective potentials

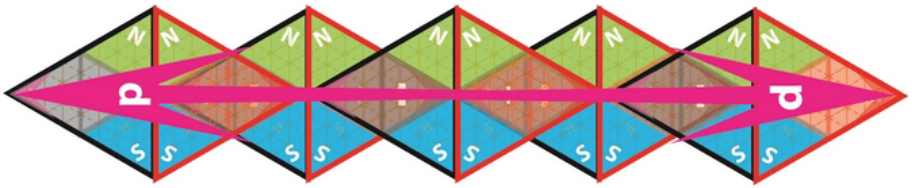
Increasing the Voltage of the discharges in the same time duration increases the total Momenta of the wave

Positive Longitudinal Waves

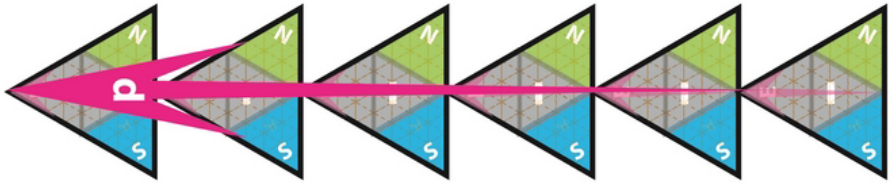




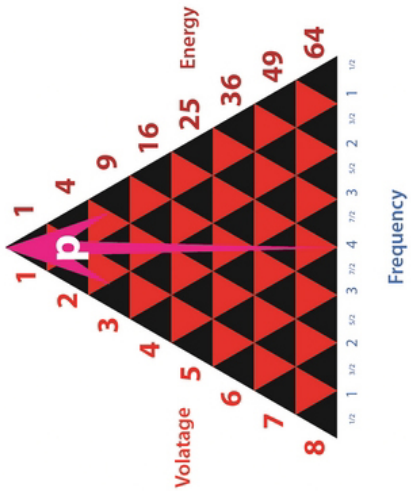
bi-directional ‘Action at a Distance’



‘Equal & Opposite reactions’



Negative Longitudal Wave

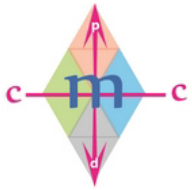


Longitudinal waves are produced by DC discharges and are unidirectional

Once established bi-directional Longitudinal waves act as a ‘instantaneous ‘rigid conductor’ of energy and information along their entire momenta length

The Velocity of Electrical Energy

Transverse EM waves propagate at energy at the speed of light



Longitudinal EM waves can propagate energies in excess of the speed of light

as their energy momenta are aligned with the direction of travel

The velocity of Electrical Energy must not be confused with Current
(the induced velocity of charged particles resulting from Electric field Energy-momenta interactions)

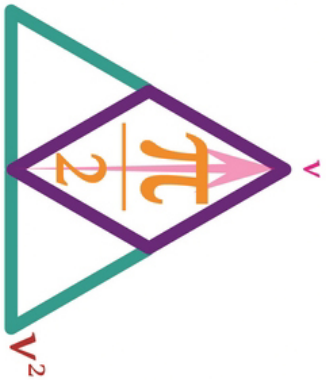
[π/2] c

463,491,072 km/second

288,000 miles/second

470,912,891 m/s

Electrical fields (if properly orientated) can create longitudinal 'action-at-a-distance' E fields



which, once established, can tranfer Energy and information at speeds faster that light through direct propagation of linear momenta

Wheatsone achieved renown by a great experiment
The measurement of the velocity of electrical Energy in a wire.

He cut the wire at the middle, to form a gap which a spark might leap across, and connected its ends to the poles of a Leyden jar filled with electricity. Three sparks were thus produced, one at either end of the wire, and another at the middle. He mounted a tiny mirror on the works of a watch, so that it revolved at a high velocity, and observed the reflections of his three sparks in it.

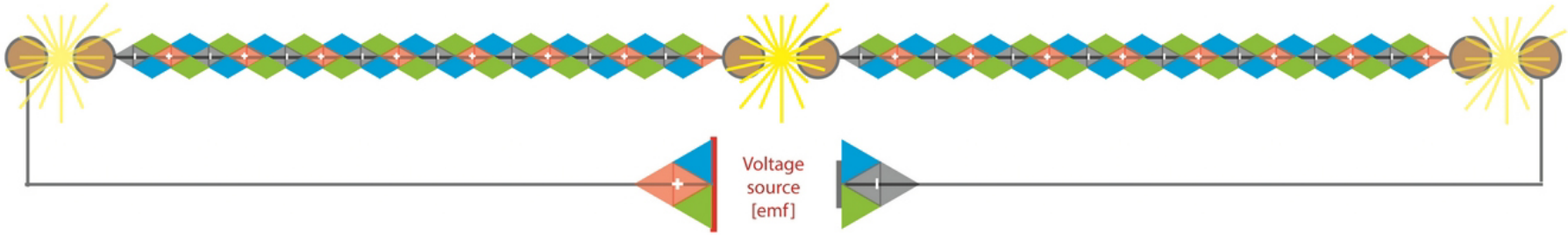
The points of the wire were so arranged that if the sparks were instantaneous, their reflections would appear in one straight line; but the middle one was seen to lag behind the others, because it was an instant later. The electricity had taken a certain time to travel from the ends of the wire to the middle.

This time was found by measuring the amount of lag, and comparing it with the known velocity of the mirror. Having got the time, he had only to compare that with the length of half the wire, and he could find the velocity of electricity.

His results gave a calculated velocity of 288,000 miles per second, i.e. faster than what we now know to be the speed of light

Charles Wheatstone

(6 February 1802 – 19 October 1875)

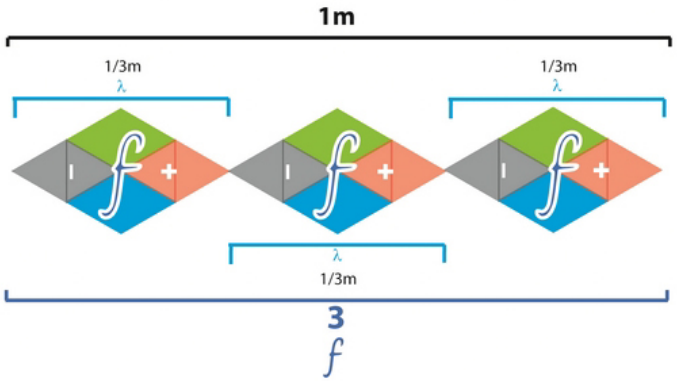


Wheatstone measured the velocity of LONGITUDINAL electrical energy using spark gaps
[as opposed to transverse waveforms produced by oscillating voltages]

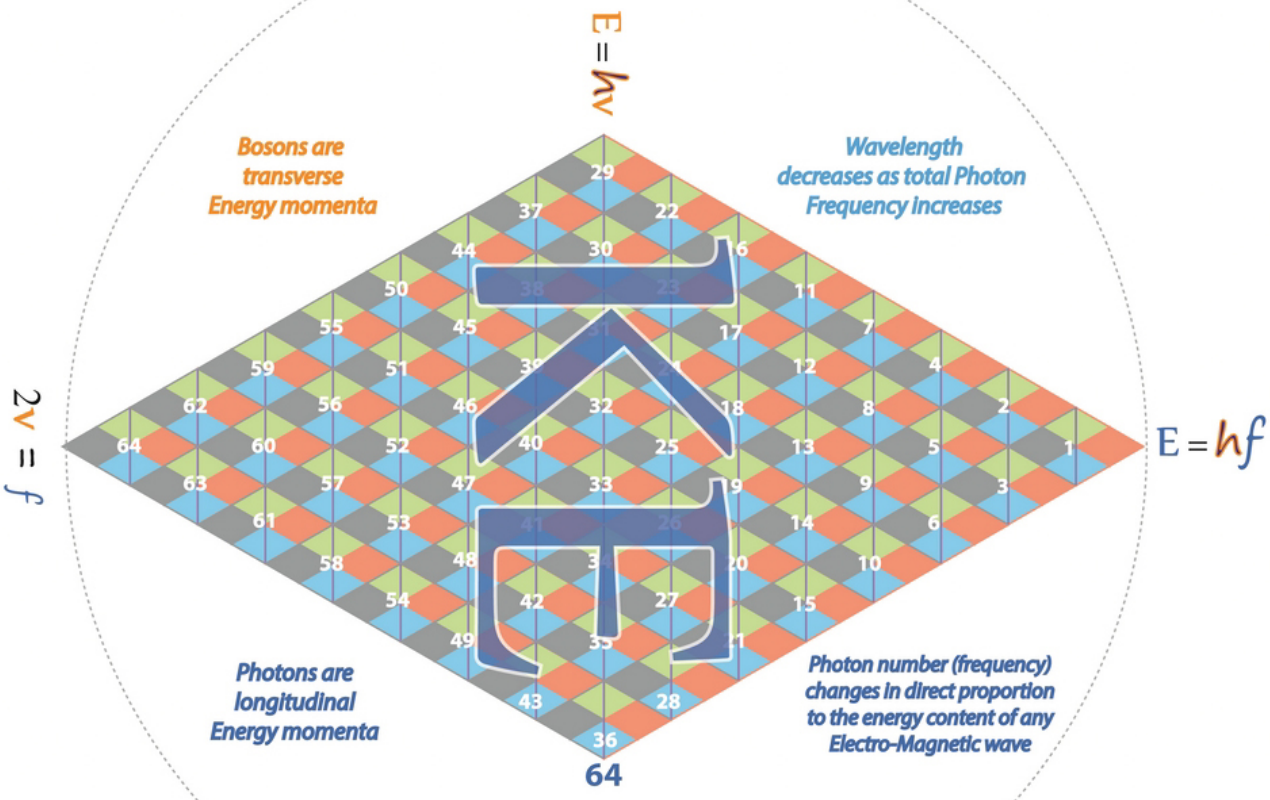
Irrespective of whether they are
Transverse or Longitudinal, EM waves are
comprised of Photons that have wavelengths
& frequencies that are related to each other through
the square root of their total EM permittivity & permeability
[the velocity of light 'c']

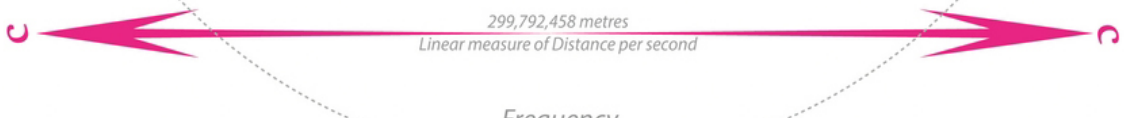
f
Frequency

Frequency is the number of neutral quanta sets
repeating per unit time in a EM wave

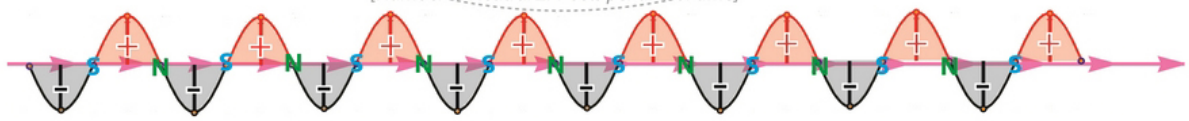


The specific wavelengths and frequencies of Energy momenta
in KEM fields form the basis for Spectral emission/absorption lines





Frequency
[Number of Neutral ZPF sets per unit of time]

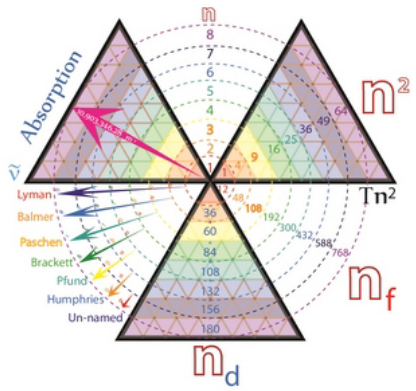


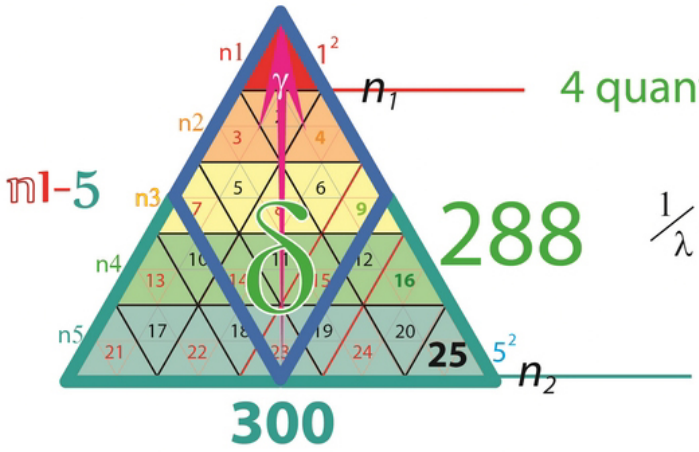
$$f \left[\frac{c^2}{A} \right]$$

Frequency

Frequency is directly
related to the nett
Quantised Angular momentum
of any c^2 geometry

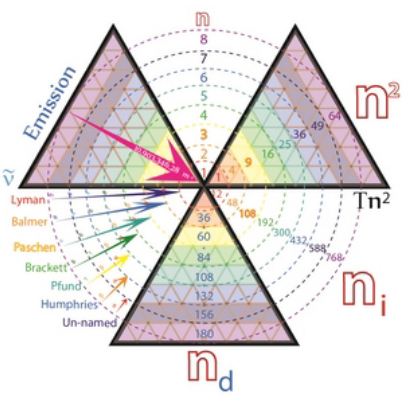
Absorption - Emission





$$\frac{1}{\lambda} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

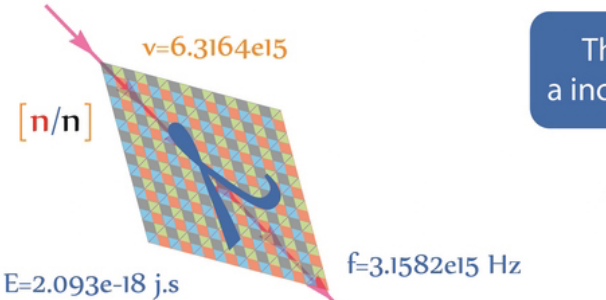
.96

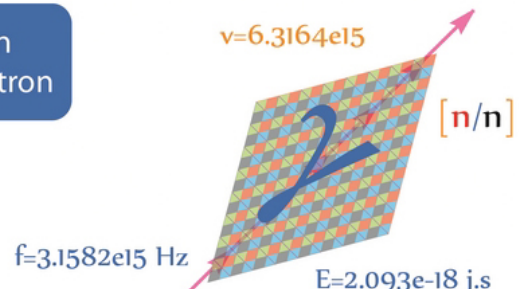


The absorption (or emission) of a photon by an electron results in a increase (or decrease) in the Kinetic EM mass-Energies of the electron

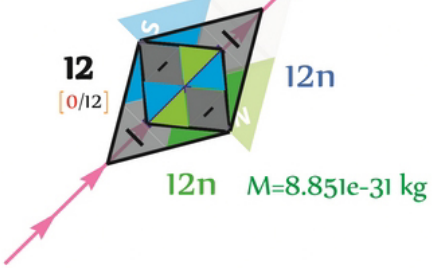
In the 1880s, Rydberg developed a formula describing the relation between the wavelengths in spectral lines of alkali metals, in turn finding the Rydberg Constant.

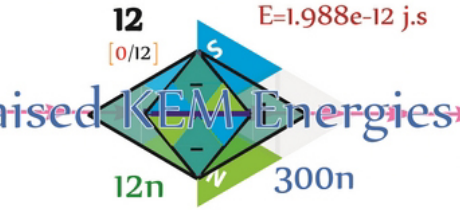
The Rydberg constant represents the limiting value of the highest wavenumber (the inverse wavelength) of any photon that can be emitted from the hydrogen atom, or, alternatively, the wavenumber of the lowest-energy photon capable of ionizing the hydrogen atom from its ground state.





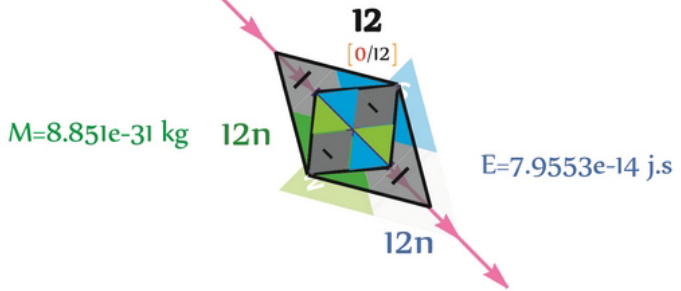
Absorption





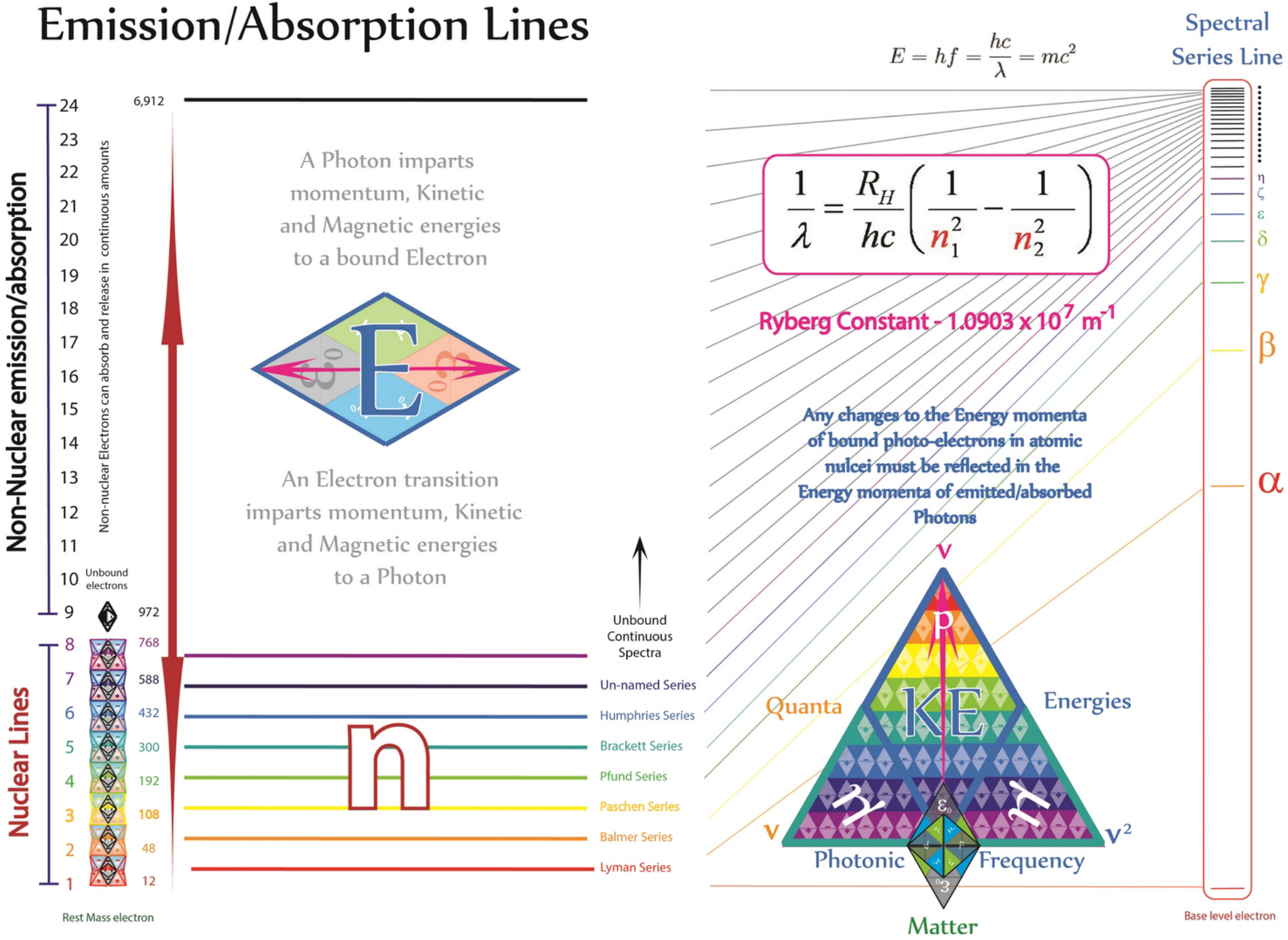
Raised KEM Energies

Emission



$$Mv^2 = KEM = hv^2$$

Emission/Absorption Lines



Revealing Rydberg Formula's geometry

The Rydberg formula is used in atomic physics to describe the wavelengths of spectral lines of many chemical elements.

$$\frac{h}{Mv} = \lambda$$

Wavelength is inversely related to Frequency

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

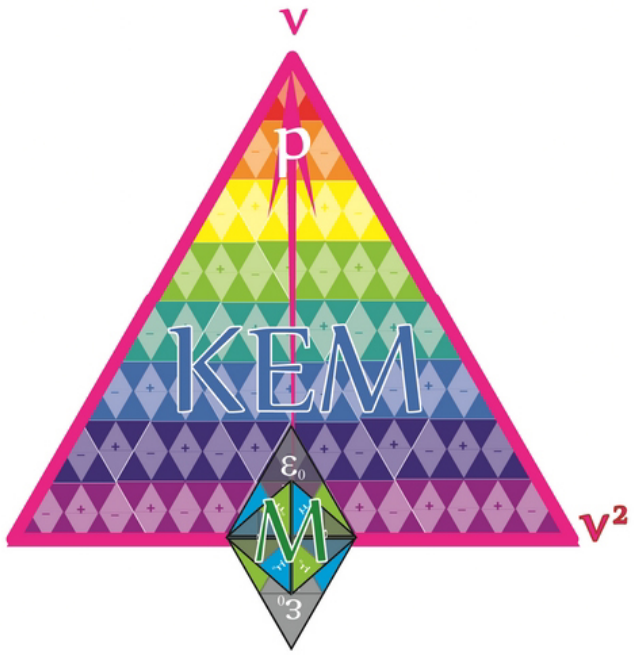
$$p/h = \tilde{\nu}$$

Wavenumbers are a inverse measure of Wavelengths

$$p^2 = E = Mv^2$$

Tetryonic geometry can be applied to Kinetic EM field variations produced by the emission and absorption of Photons by electrons in Nuclear orbits to reveal the geometry behind Rydberg's formula

$$p = \frac{E}{v} = hv$$



Compton frequency

$$\frac{Mv^2}{h} = f$$

EM Field — Planck quanta

$$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

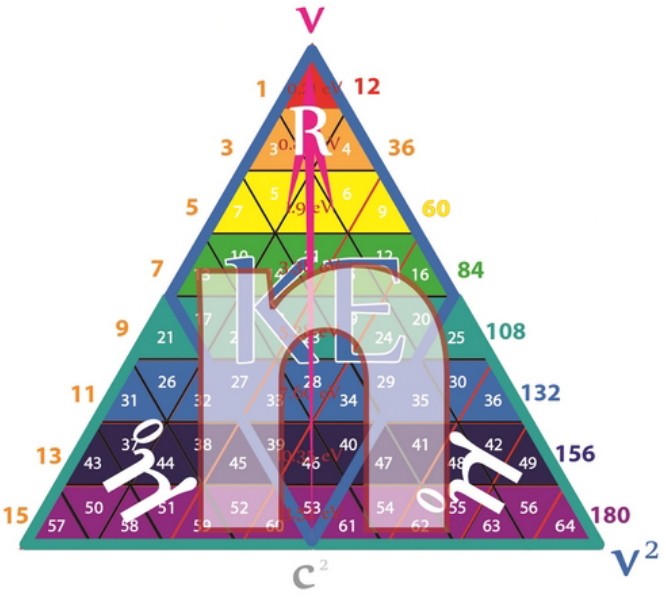
Photoelectron KEM fields — ElectroMagnetic — mass — velocity

$$Mv = \frac{KEM}{v} = hv$$

(13.525 eV)

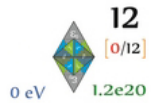
Spectral line emissions reveals Rydberg's formula to be a measure of longitudinal KEM momenta

$$KEM = hcR$$



Wavelengths and Frequency are related through the Velocity of propagation

$$\lambda_{KEM} = \frac{f}{v}$$



n0

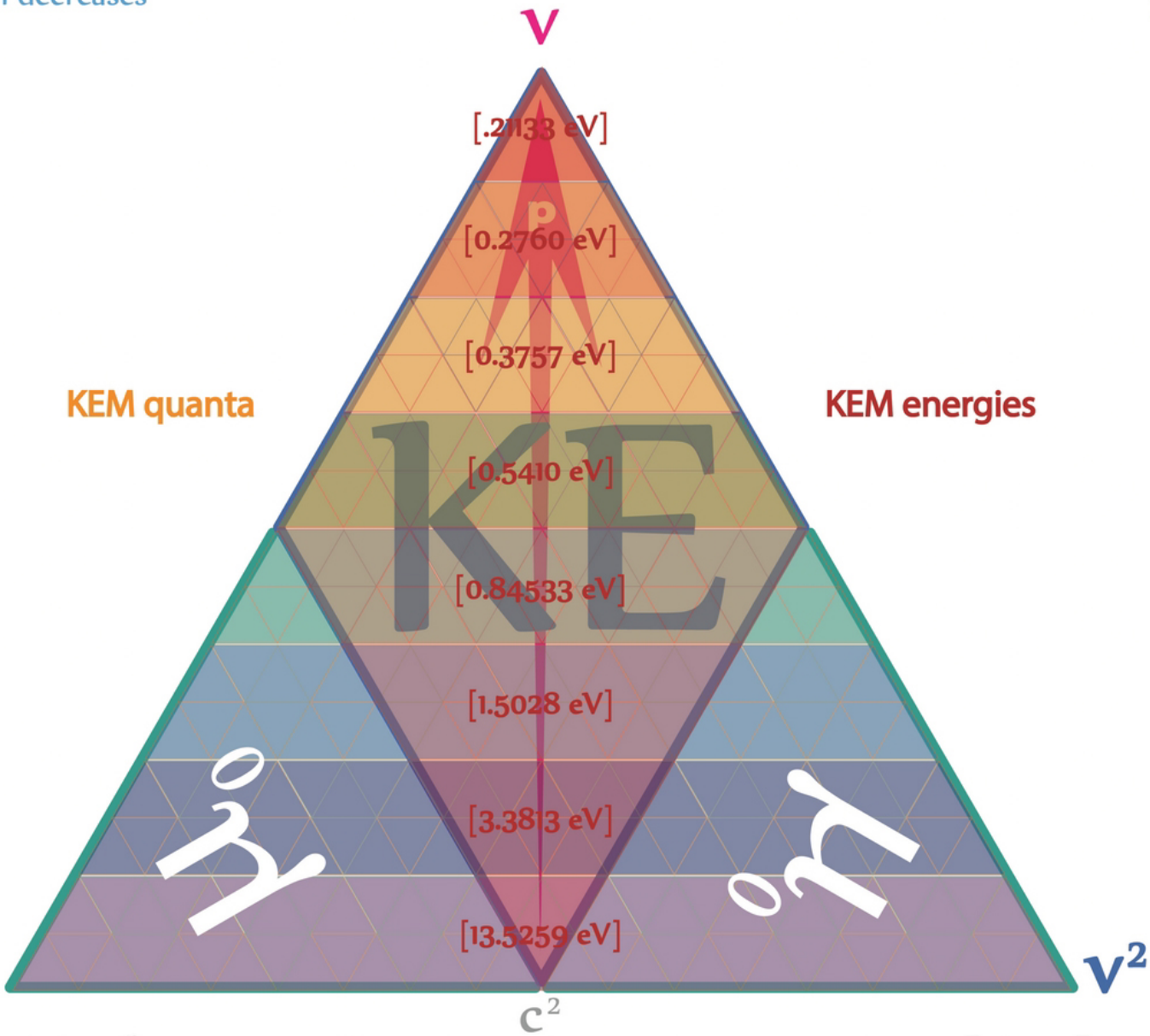
As the KEM field energy increases the KEM wavelength decreases

As the Energy of a KEM field increases so does the velocity of its associated Matter

$$\frac{Mv^2}{c^2} = \underset{c^2}{KEM} = \frac{hv^2}{c^2}$$

KEM field energy is subject to Lorentz corrections

n1 n2 n3 n4 n5 n6 n7 n8



5.109431785 e13
2.043772714 e14
4.598488607 e14
8.175090856 e14
1.277357946 e15
1.839395443 e15
2.503621575 e15
3.270036343 e15

Hydrogen Spectral Frequencies

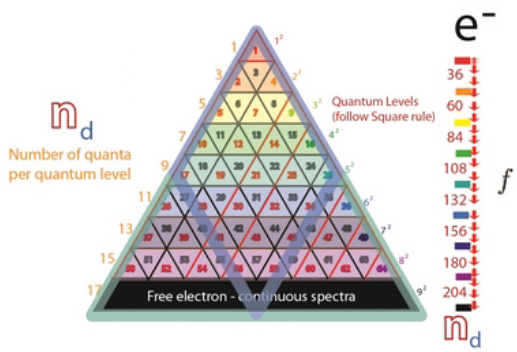
Free Electron

Hydrogen Ionisation Energies [/n²]

13.6eV

Absorption lines

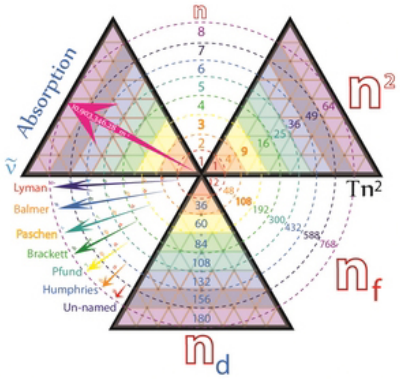
Increase in electronic energy and frequency



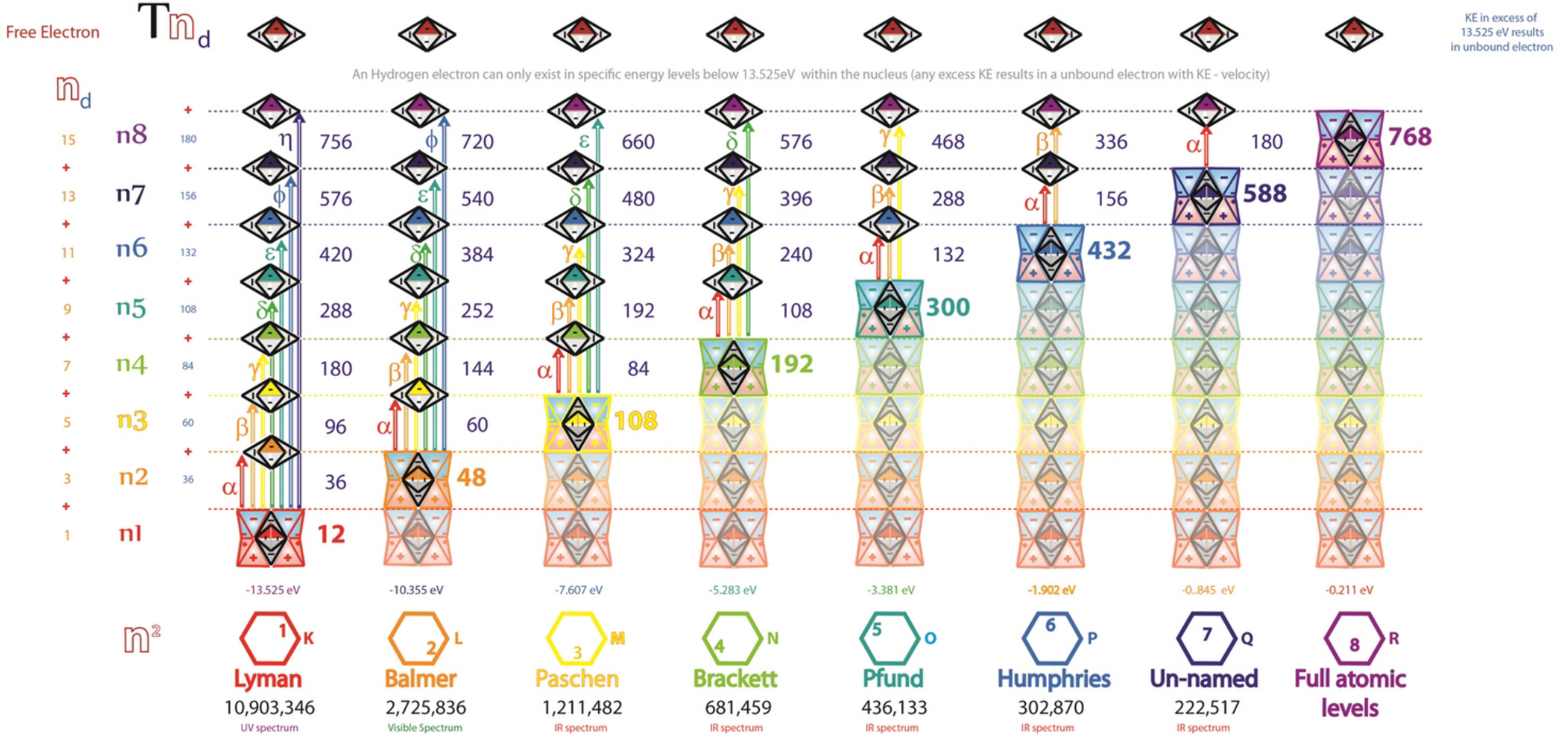
$$f = R\left(\frac{1}{n^2} - \frac{1}{m^2}\right)$$

When an electron 'absorbs' a Photon it 'jumps' from one energy level to another, dependent on the energy and frequency of the incident photon

$$\triangle E = hf$$



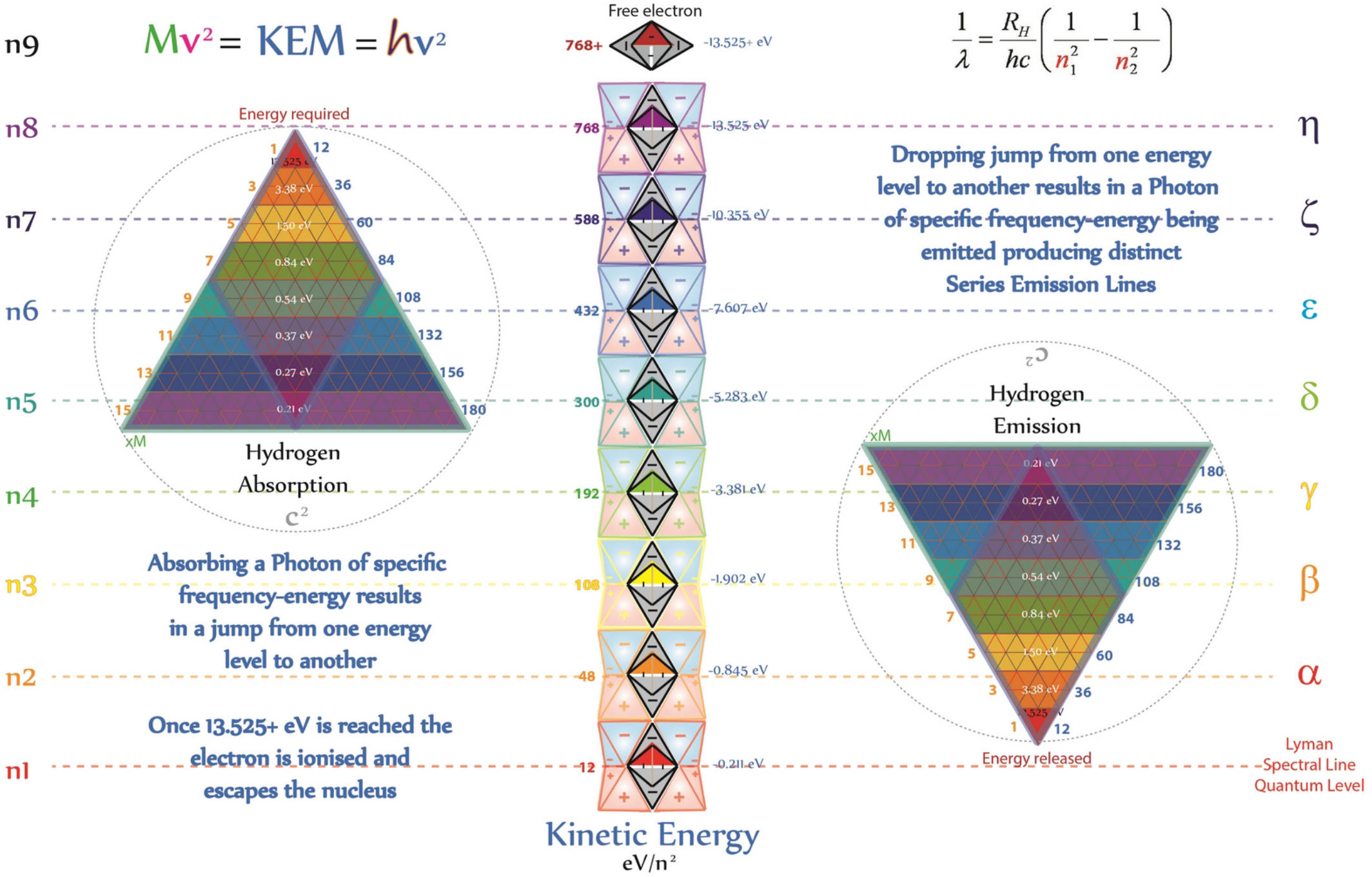
The Quantum level of the nuclei determines the ground quantum level of electrons within the nucleus
All transitions within the nulceus are discrete quantum jumps - outside the nucleus all spectra are continuous



Absorption / Emission Lines

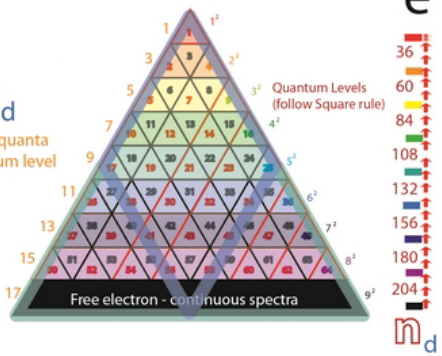
$Mv^2 = KEM = hv^2$

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$



Emission lines

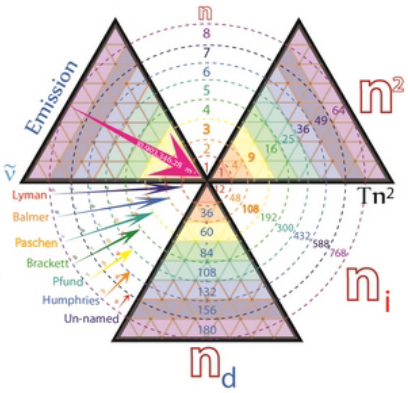
Decrease in electronic energy and frequency



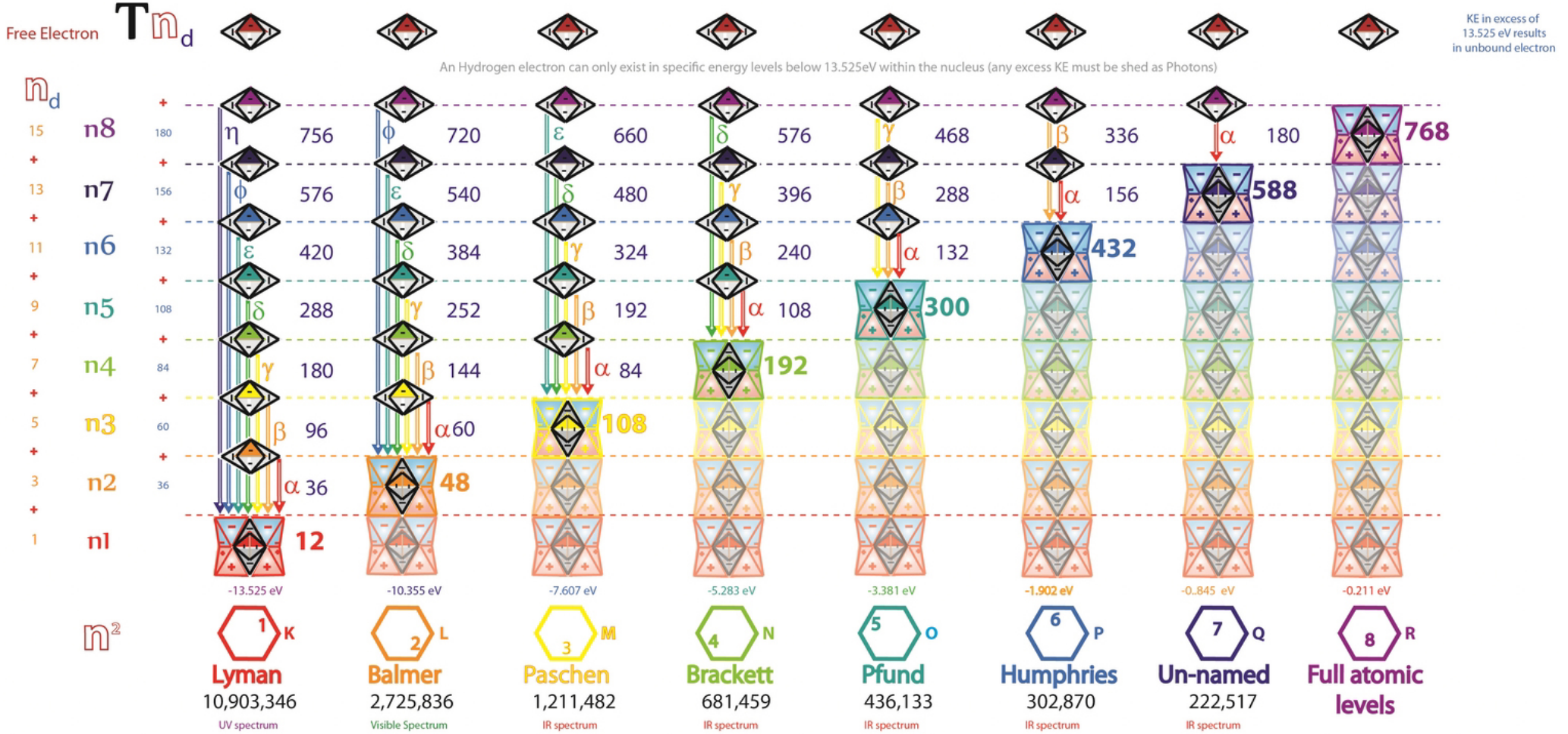
$$f = R\left(\frac{1}{n^2} - \frac{1}{m^2}\right)$$

When an electron 'emits' a Photon it 'drops' from one energy level to another dependent on the energy and frequency of the ejected photon

$$\triangle E = hf$$



The Quantum level of the nuclei determines the ground quantum level of electrons within the nucleus
All transitions within the nulceus are discrete quantum jumps - outside the nucleus all spectra are continuous



Rydbergs Constant

$$R_H = \frac{c}{27.49545}$$

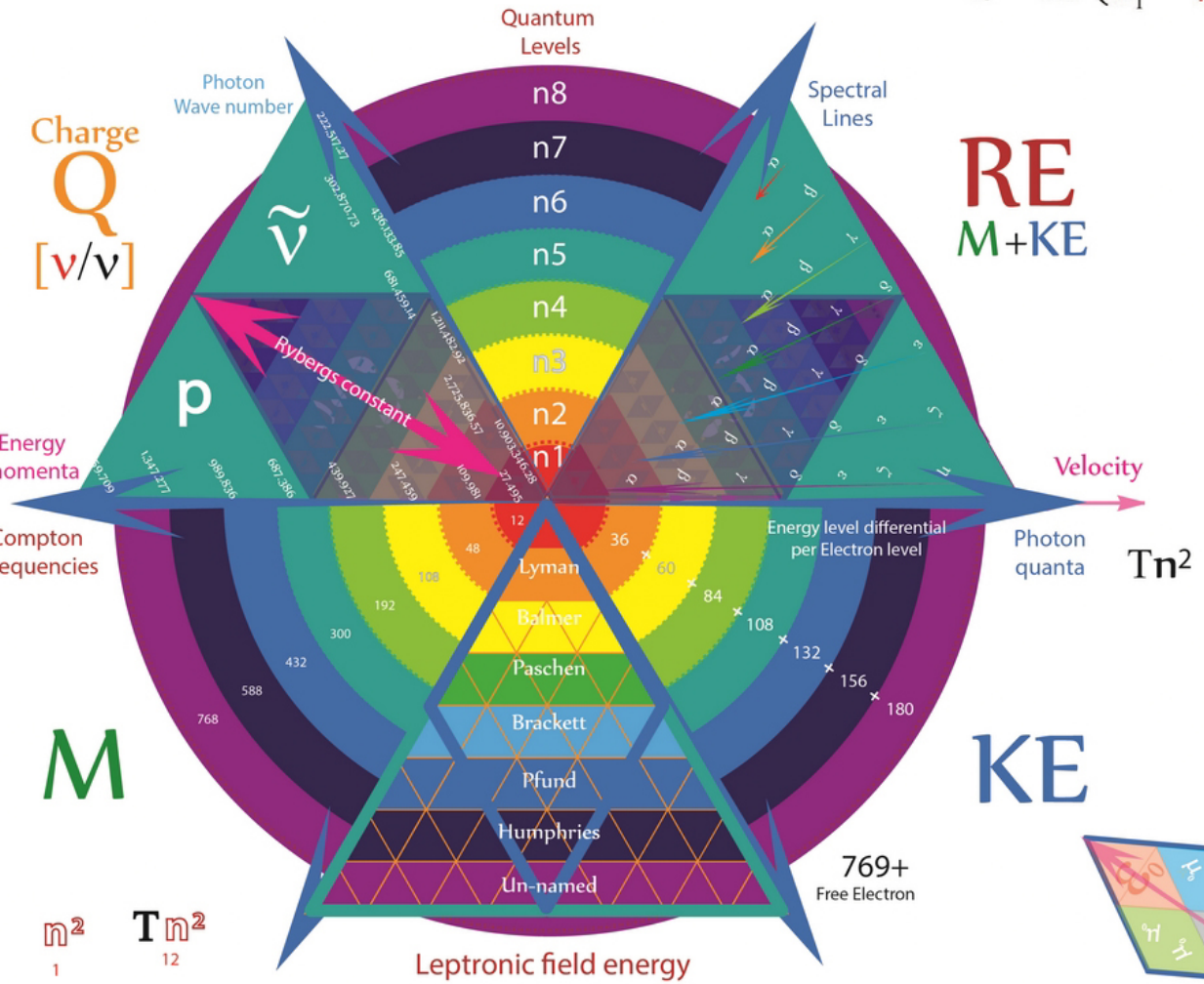
1.0903346.28 x 10^7 m-1

Using the Tetryonic model of an electron and its associated quantum energy levels we see that Rydberg's constant is a reflection of the electronic KEM field - and in turn a reflection of photonic energy-momentum

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

Johannes Robert Rydberg

(November 8, 1854 – December 28, 1919)



$$c = f\lambda$$

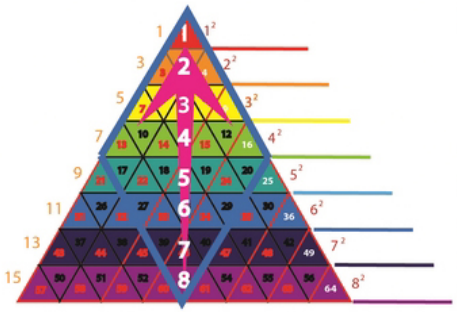
$$\tilde{\nu} = \frac{c}{27.49545}$$

$$f = \frac{c^2}{27.49545}$$

$$\lambda = \frac{27.49545}{c}$$

$$p = 27.49545$$

$$KE = \frac{1}{2}Mv^2$$



n^2	Tn^2
1	12
4	48
9	108
16	192
25	300
36	432
49	588
64	768

$$p^2 = KEM = Mv^2$$

Quantum Jump

The energy and wavelength of emitted photons is a function of the electron's wavefunction

27.49545

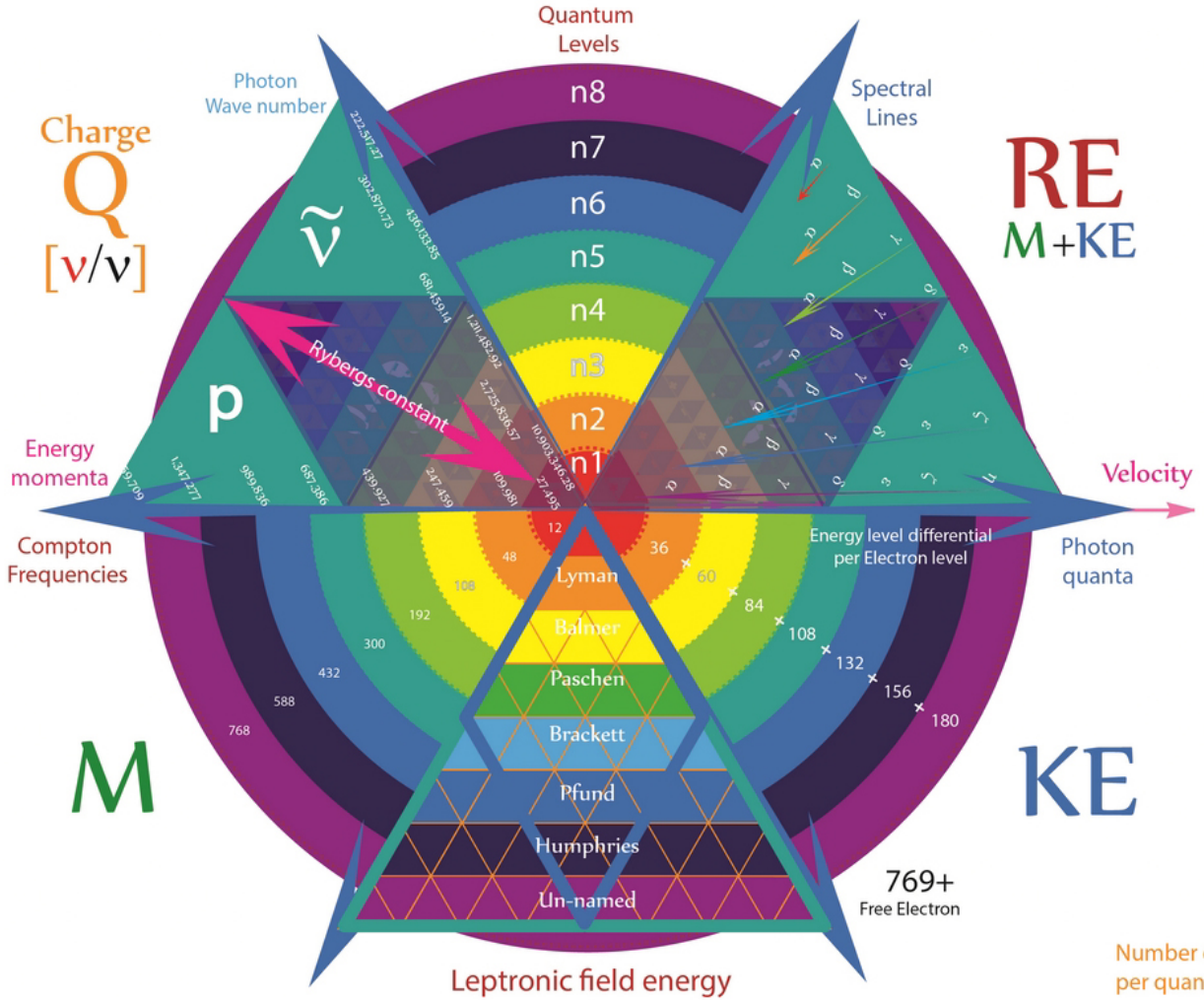
$$KEM = n.hv^2$$

Photons

$$Mv^2 = KEM = hcR_H$$

13.525 eV

Rydberg Constant and Wavenumbers



$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

Johannes Robert Rydberg

(November 8, 1854 – December 28, 1919)

Currently accepted value - 10,973,731 m^{-1}

Rydberg's Constant can be shown to be the square root of the total number of quanta required to increase a n1 electron to n8
(the highest quantum level within the nucleus)

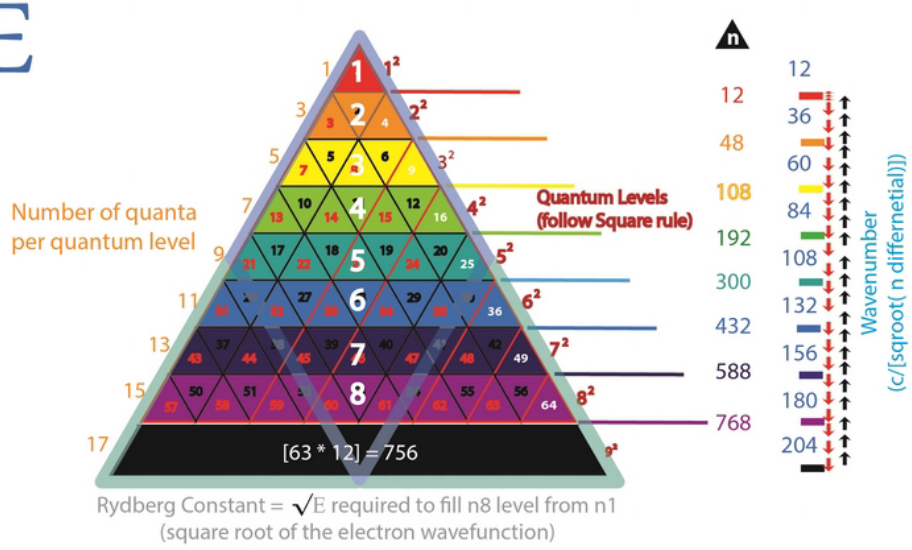
Tetryonic theory value - 10,903,346 m^{-1}

$$p^2 = KEM = Mv^2$$

The Wavenumber is simply the number of quanta [ν] required to enable an electron to transition between specific Quantum levels divided by c

$$Mv^2 = KEM = hcR_H$$

Leptons absorb/emit Energy



Rydberg Constant = √E required to fill n8 level from n1
(square root of the electron wavefunction)

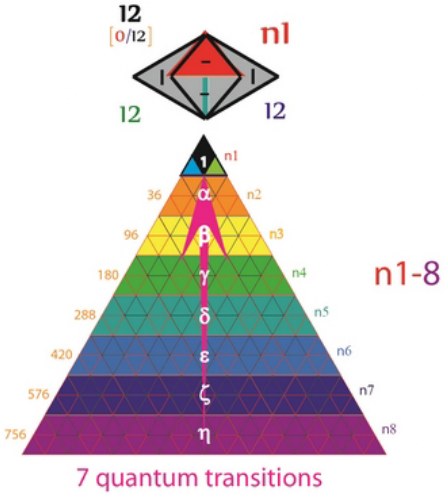
Rydberg Constant

(reflective of changes in linear momenta due to transitions)

Lyman	27.49545417
Balmer	109.9818167
Paschen	247.4590875
Brackett	439.9272667
Pfund	687.3863542
Humphries	989.8363501
Un-named	1,347.277254

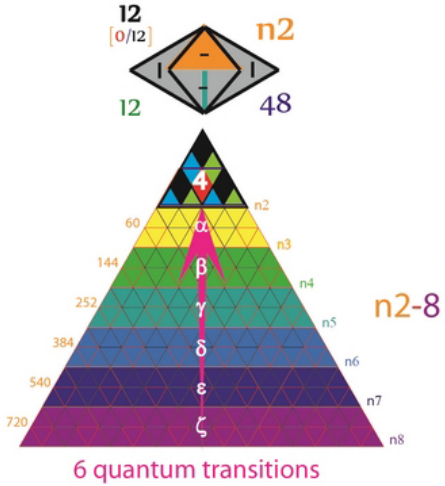
Square root of Energy required to transition nuclear quantum levels

$$\left[\sqrt{756}\right].n^2$$



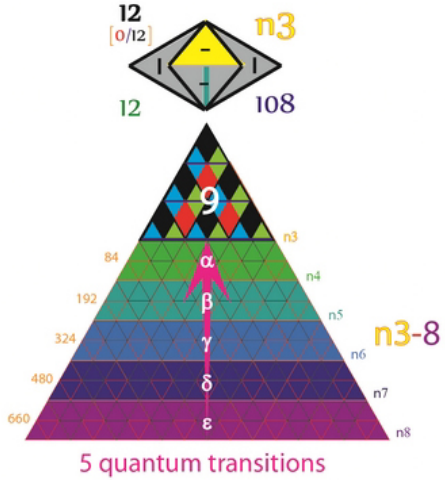
n1-8

7 quantum transitions



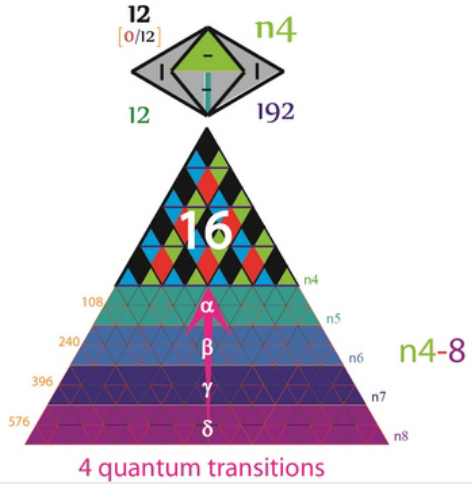
n2-8

6 quantum transitions



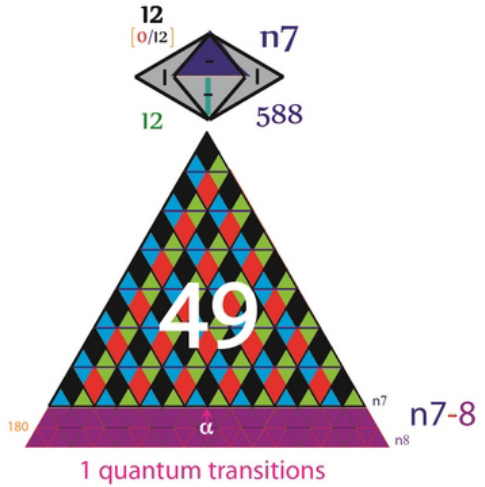
n3-8

5 quantum transitions



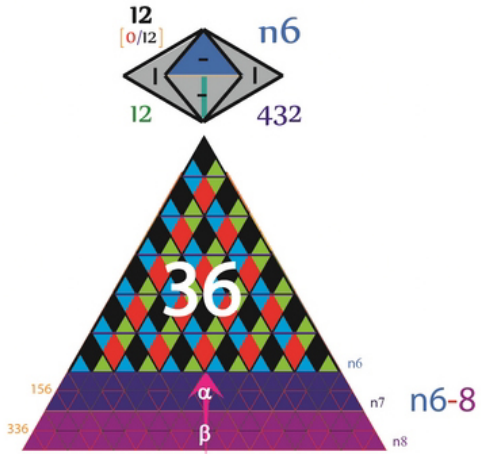
n4-8

4 quantum transitions



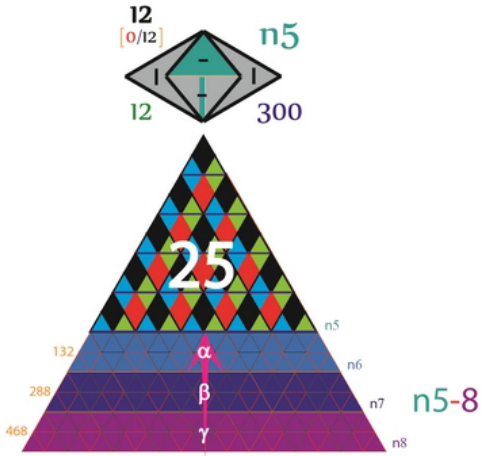
n7-8

1 quantum transitions



n6-8

2 quantum transitions

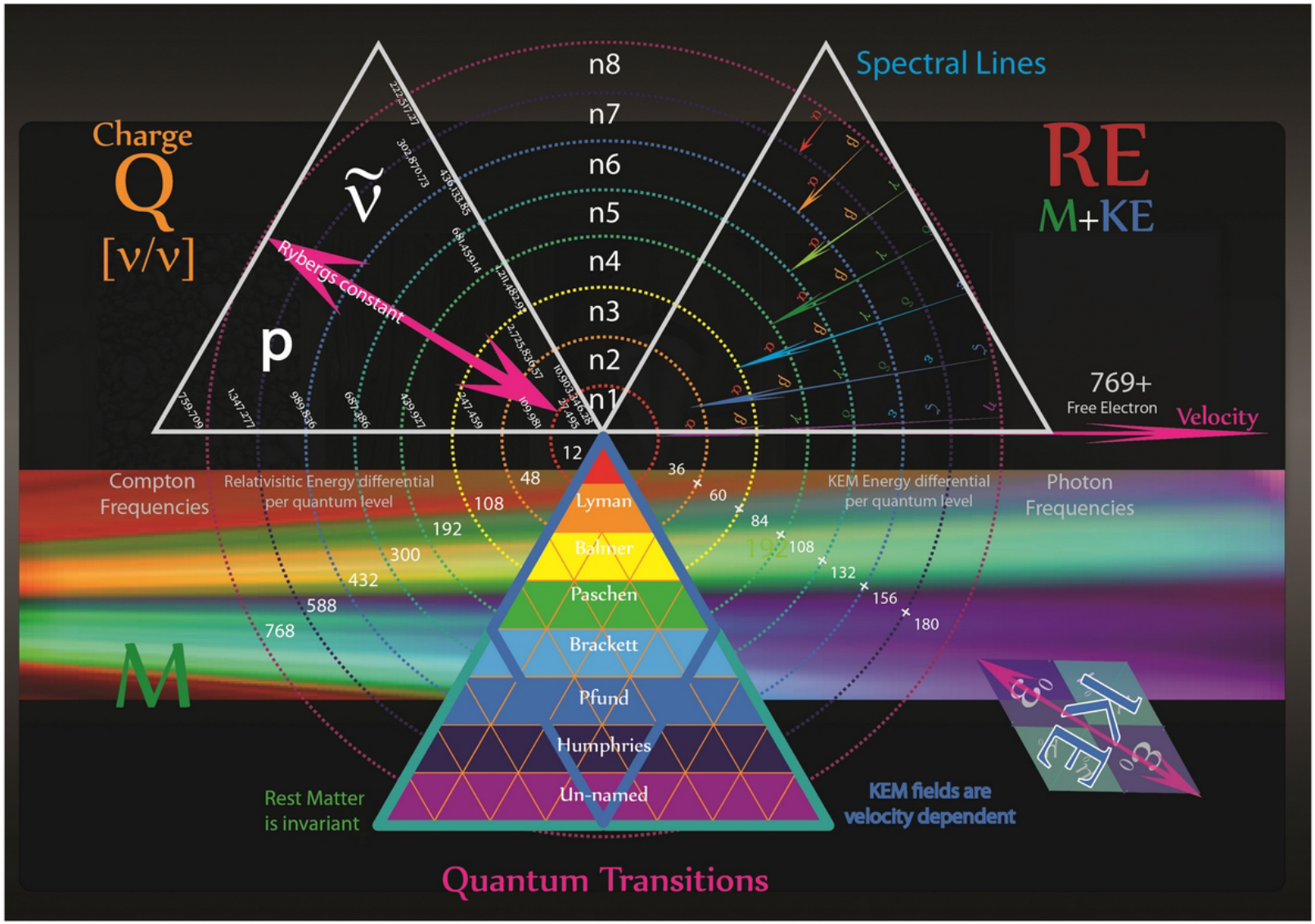


n5-8

3 quantum transitions

Spectral Lines

Spectral lines are the result of interaction between a quantum system (usually atoms, but sometimes molecules or atomic nuclei) and a single photon.
When a photon has about the right amount of energy to allow a change in the energy state of the system (in the case of an atom this is usually an electron changing orbitals),
the photon is absorbed. Then it will be spontaneously re-emitted, either in the same frequency as the original or in a cascade, where the sum of the energies of the photons emitted will be
equal to the energy of the one absorbed (assuming the system returns to its original state). The direction and polarization of the new photons will, in general, correlate with those of the original photon.



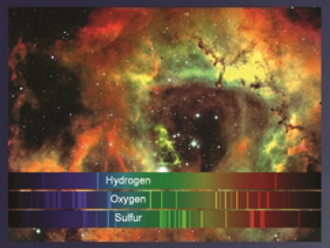
Spectral lines are highly atom-specific, and can be used to identify the chemical composition of any medium capable of letting light pass through it (typically gas is used).
Several elements were discovered by spectroscopic means, such as helium, thallium, and cerium.
Spectral lines also depend on the physical conditions of the gas, so they are widely used to determine the chemical composition of stars
and other celestial bodies that cannot be analyzed by other means, as well as their physical conditions.

White Light

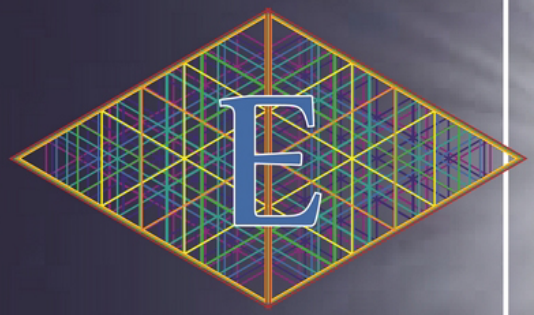
White light is radiated by our SUN and all the stars throughout the Universe.
In fact, most of the energy radiated by the sun is within the visible spectrum, which is most likely why we see this range.

Incandescence is the greatest known generator of white light. The verb incandesce means to glow white. This is also referred to as black-body radiation.

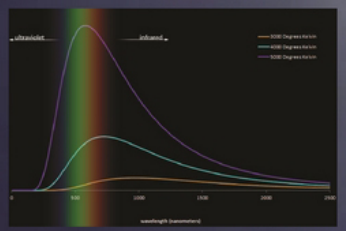
The color of a black body object at high temperatures causes it to glow, and the waves emitted include visible light.
In addition to the sun and common light bulb, molten materials such as metal or glass also glow incandescently.



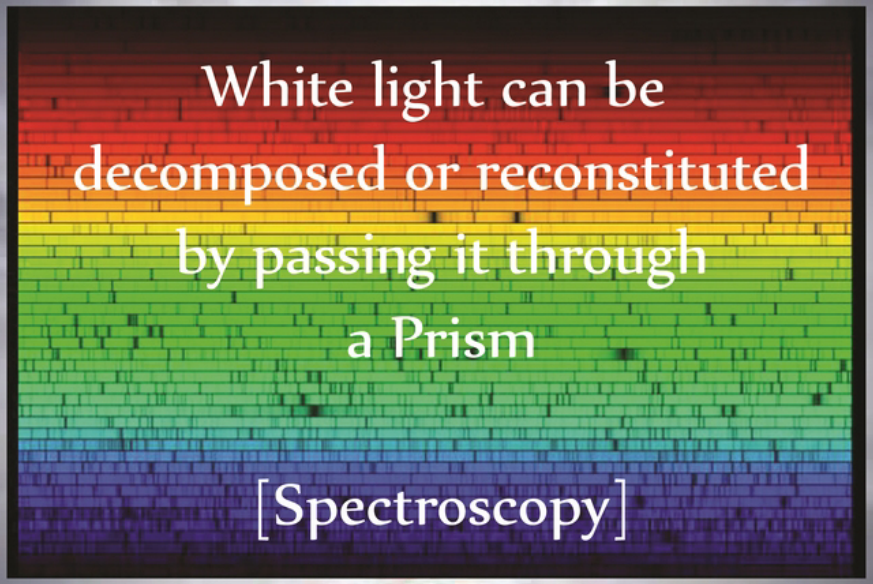
Spectroscopy



Planck's Heat Law

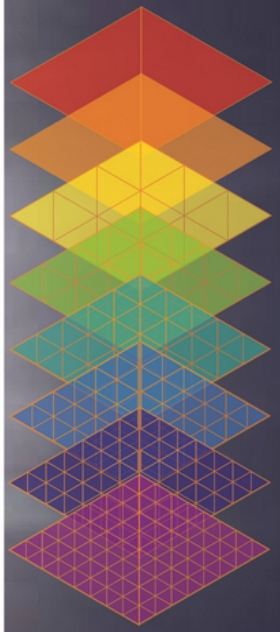


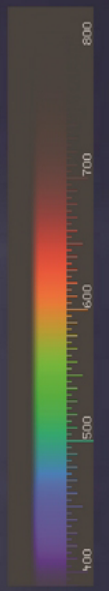
Most light sources are thermal, meaning the type of radiation they emit is a characteristic of the source's temperature.



White light is comprised of many photons of varying frequencies and wavelengths

Each colour of light has a specific frequency and wavelength





Microwaves
Visible Light
UV rays

Until Newton's work became accepted, most scientists believed that white was the fundamental color of light; and that other colors were formed only by adding something to light. Newton demonstrated this was not true by passing white light through a prism, then through another prism. If the colors were added by the prism, the second prism should have added further colors to the single-colored beam. Since the single-colored beam remained a single color, Newton concluded that the prism merely separated the colors already present in the light.

White light is the result of superpositioning of the visible colors [varying frequencies] of EM waves

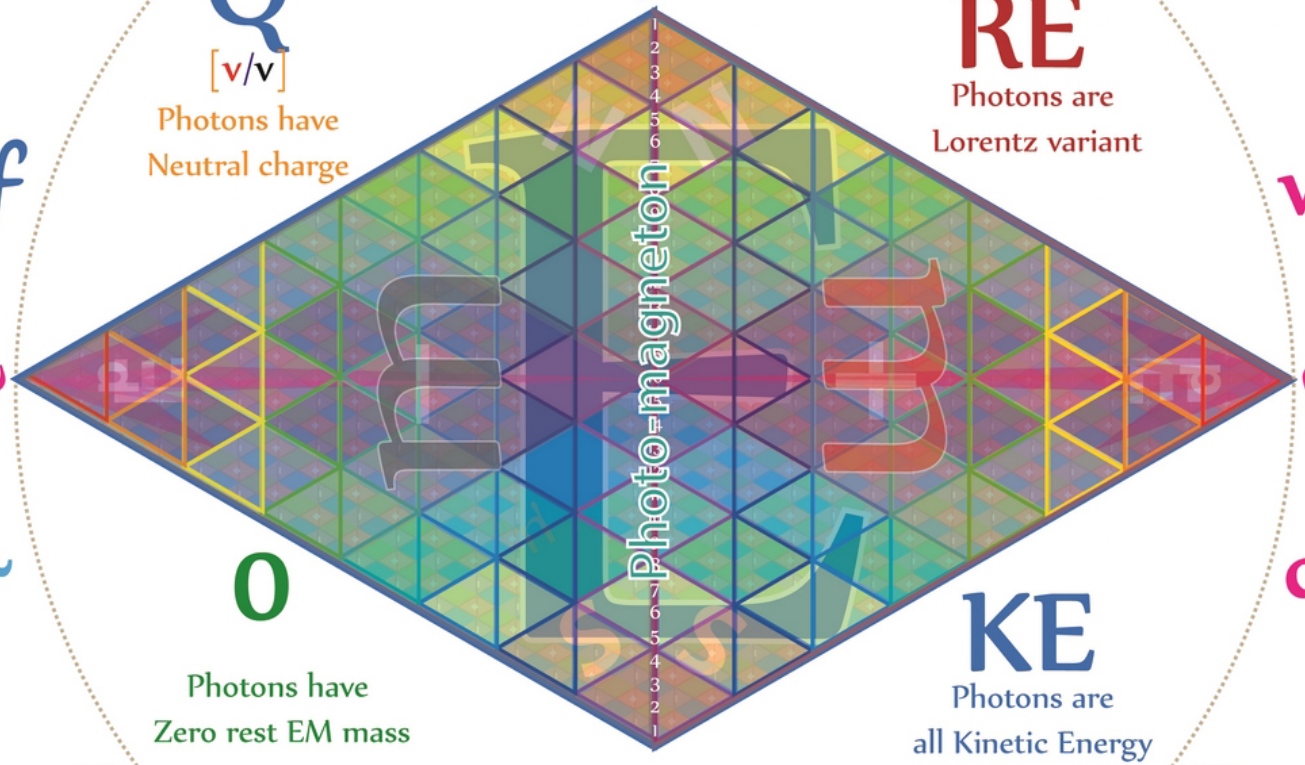
Photonic mass-Energy relationships

Photons are comprised of dual EM masses

Photons are KEM Energy-momenta propagating at the speed of Light

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field (Photons) · Planck quanta · ElectroMagnetic mass · velocity



kg

m

Q

[v/v]

Photons have Neutral charge

f

RE

Photons are Lorentz variant

p

$kg\frac{m}{s}$

$\frac{1}{s}$

f

v

$\frac{m}{s}$

Frequency and Wavelength are related by the natural speed of Energy

c

'c' is the natural speed of Energy in free space

c

m

λ

0

Photons have Zero rest EM mass

KE

Photons are all Kinetic Energy

c

$\frac{m}{s}$

$kg\frac{m^2}{s^2}$

E

E

$$2h\nu = E = hf$$

Planck · Einstein

Photons have 'Matterless' charge geometries

c^2

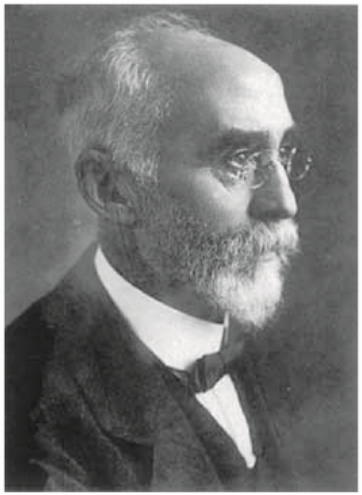
1 second

Kinetic Energy is 1/2 the energy created by Matter in motion

$\frac{m^2}{s^2}$

Lorentz factor corrections

Hendrik Lorentz



(18 July 1853 – 4 February 1928)

$$\sqrt{1-\beta^2}$$

$$\sqrt{1-\left(\frac{v}{c}\right)^2}$$

$$E=\frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}$$

The Lorentz transformation was originally the result of attempts by Lorentz and others to explain how the speed of light was observed to be independent of the reference frame, and to understand the symmetries of the laws of electromagnetism.

Albert Einstein later re-derived the transformation from his postulates of special relativity.

The Lorentz transformation supersedes the Galilean transformation of Newtonian physics, which assumes an absolute space and time.

According to special relativity, the Galilean transformation is a good approximation only at relative speeds much smaller than the speed of light.

rest mass-Matter — Planck quanta

$$\frac{4n\pi}{c^4}\left[\left[mAv^2\right]\right]$$

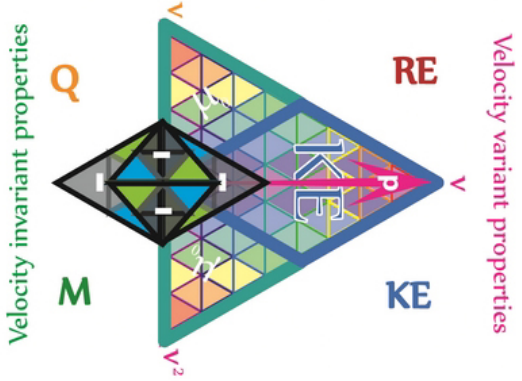
mass — velocity

spatial co-ordinate system

Matter is EM energy propagating at the 'speed of Light' in a standing wave energy geometry

One of the greatest mistakes in relativistic mechanics is the application of Lorentz corrections to Matter.

It stems from there being no definition of, and enforced differentiation between EM mass and Matter



$$m = \frac{E}{c^2}$$

2D planar fields are relativisitic

Radiant EM masses

$$\frac{m}{c^2} = M$$

Standing-wave Matter

3D standing-waves are velocity invariant

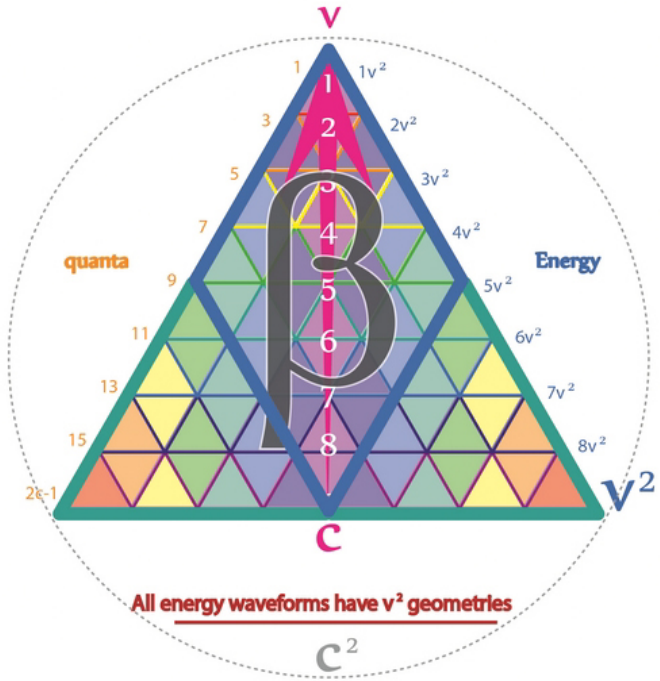
$$\frac{E}{c^4} = M$$

mass is a property of Matter - Matter is not a property of mass
[they are directly related throught the velocity of light]

$$\beta = \left[\frac{v}{c}\right]$$

Velocity is a vector

All 2D energy waveforms propagate at the 'speed of Light'



Energy is a Velocity dependent scalar

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

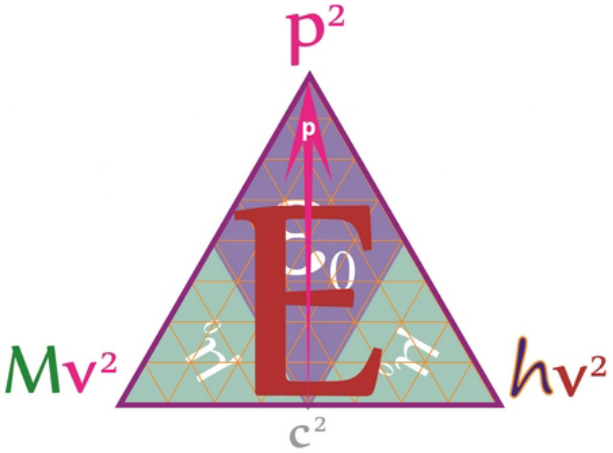
The Kinetic Energy of Matter in motion is directly related to the square of the velocity

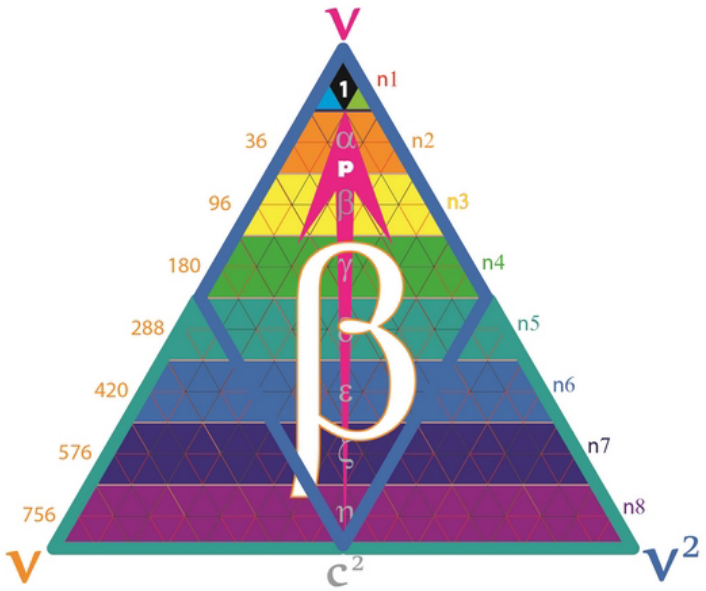
$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

All Spectral line emissions and absorptions produce changes in the energy momenta of electrons in atomic orbitals

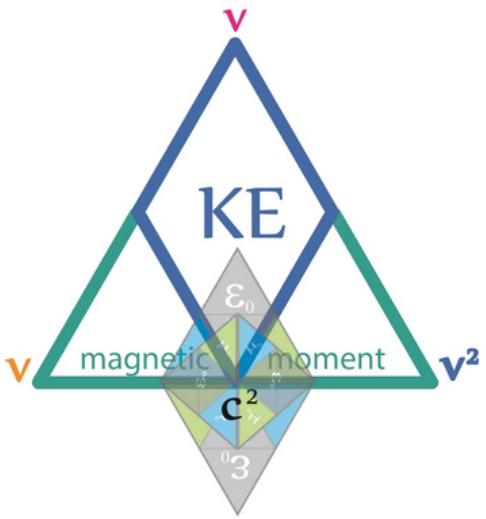
Spectral Energy relationships

$$\frac{kg\,m^2}{s^2} \quad E = p^2 \quad kg\left[\frac{m}{s}\right]^2$$





$$KEM = \frac{mv^2}{c^2}$$



$$Mv^2 = KEM = hcR_H$$

13.525 eV

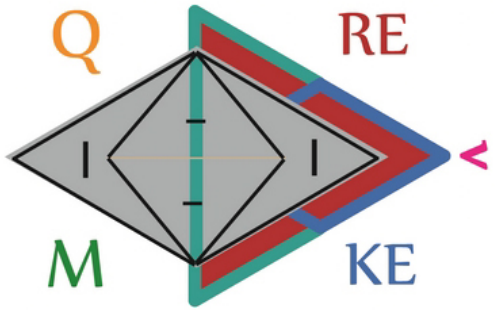
All Spectral line emissions and absorptions produce changes in KEM energies, Angular Momentum, Linear Momentum, Frequency and Wavelength

de Broglie

$$\left[\frac{A}{c}\right] = \lambda$$

Wavelength

Linear component



All 2D energy waveforms propagate naturally at the 'speed of Light'

Compton

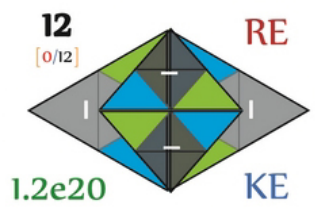
$$f = \left[\frac{c^2}{A}\right]$$

Frequency

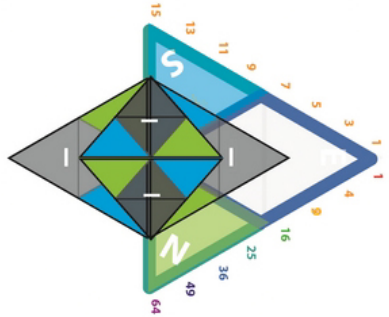
Scalar Component

Spectral photon production

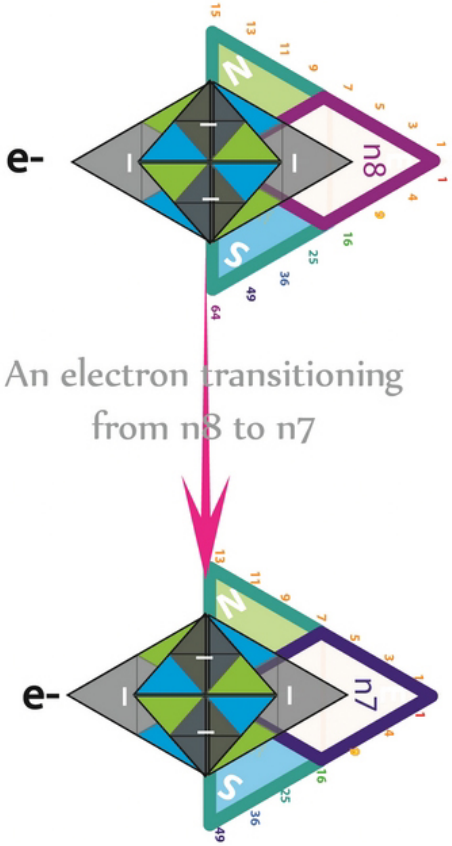
As the rest Matter of any particle in motion is invariant
any changes in velocity-momentum results in
changes to the Energy momenta content of the KEM field



At no time does the rest Matter-Energy content of the electron change

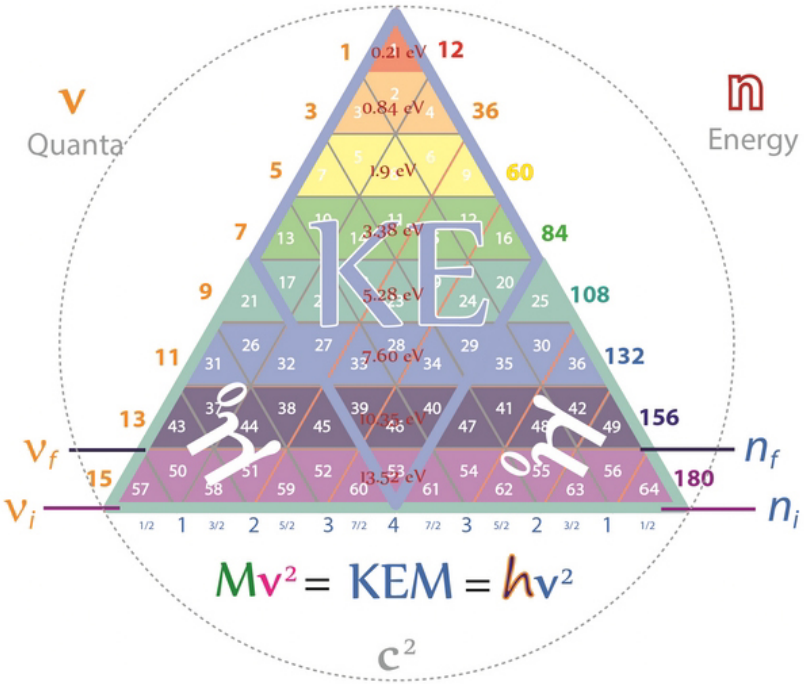


Does so by emitting Kinetic Energy quanta



An electron transitioning from n8 to n7

Kinetic Energies



λ	19,174.54158	nm
$\tilde{\nu}$	52,152.48541	m-1
f	1.563492179 x 10^{13}	Hz
E	0.064693658	eV
A	5,748.382952	m^2/s

Which are released as Photons of specific Energy-frequencies

and specific wavelengths (Spectral Lines)

Tetryonic

$$\frac{1}{\lambda} = R\left(\frac{15/49}{64}\right)$$

.0047

$$E = hf$$

Rydberg

$$\frac{1}{\lambda} = R\left(\frac{1}{49} - \frac{1}{64}\right)$$

.0047

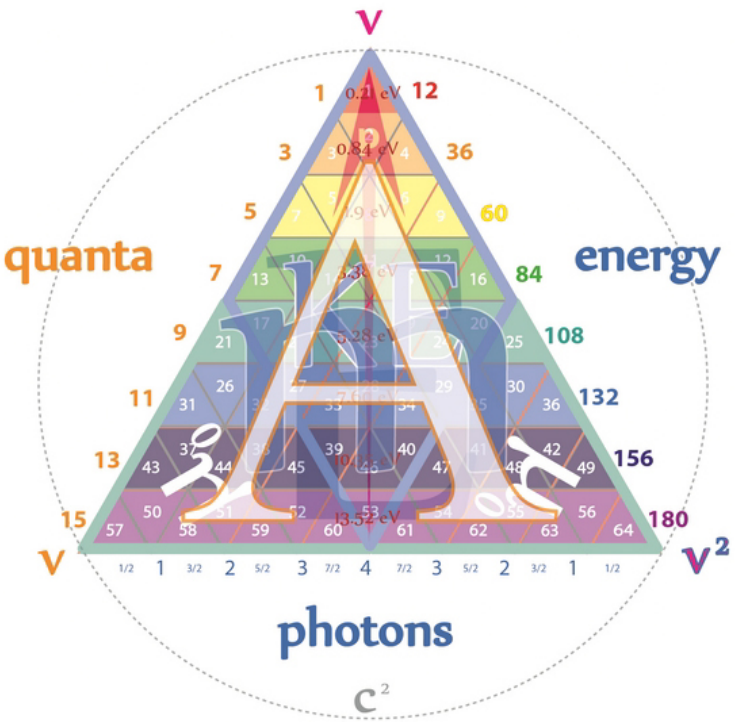
Spectral Energy - Planck relationships

Spectral Energies

Wavelength λ

Wave number $\tilde{\nu}$

Frequency f



λ deBroglie wavelength

$\tilde{\nu}$ Inverse deBroglie wavelength

ν^2 Compton Frequency

$$\frac{E}{\nu^2} = m = \frac{E}{c^2}$$

Applying mass to Spectral energy relationships reveals the familiar quantum mechanical relationships of deBroglie & Compton

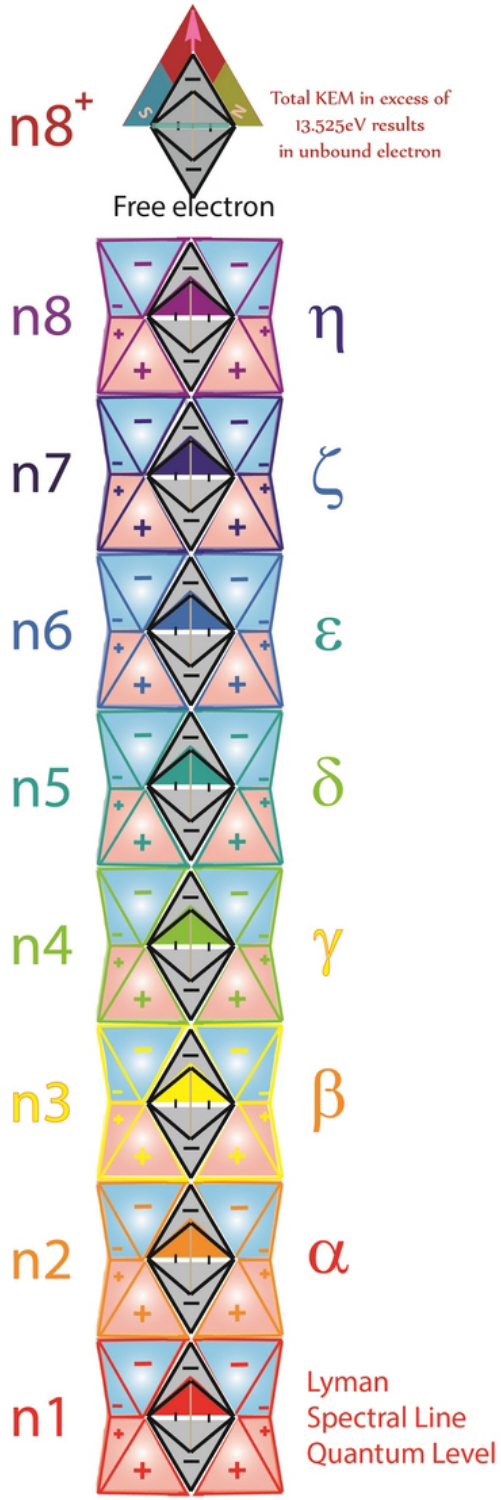
$$\begin{bmatrix} A/c \\ c/A \\ c^2/A \end{bmatrix} \times m = \begin{bmatrix} mA/mc \\ mc/mA \\ mc^2/mA \end{bmatrix} = \begin{bmatrix} h/p \\ p/h \\ E/h \end{bmatrix}$$

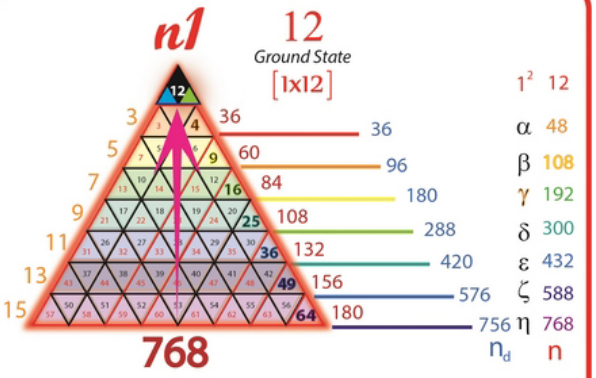
Thus, again highlighting the geometric role of EM mass-Quantised Angular Momentum [Planck's Constant]

Lyman Series

Series wavenumber - R/n^2

10,903,346.28 m^{-1}

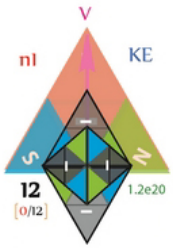




$$KEM = \frac{hf}{n^2}$$

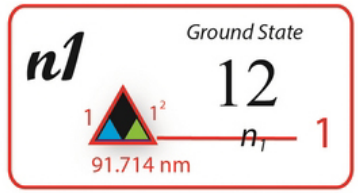
91.714 nm

K shell
Ground Electron
Kinetic Energies



$$KEM = \frac{hcR}{n^2}$$

-13.5252 eV



1,305 kj/mol

m. [A/c, c/A, c²/A]

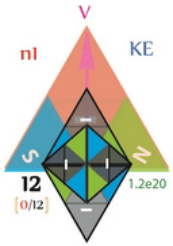
λ	91.71496292	nm
$\tilde{\nu}$	10,903,346.28	m-1
f	3.268740982 x 10^{15}	Hz
E	13.52528	eV
A	27.49545417	m^2/s

h/p
p/ħ
E/h
hf

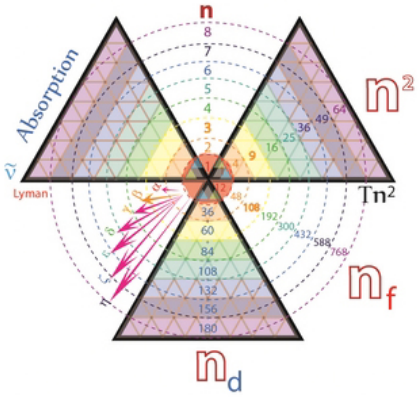
Quantised Angular & Linear momenta provides the basis for all EM waveform functions

K shell

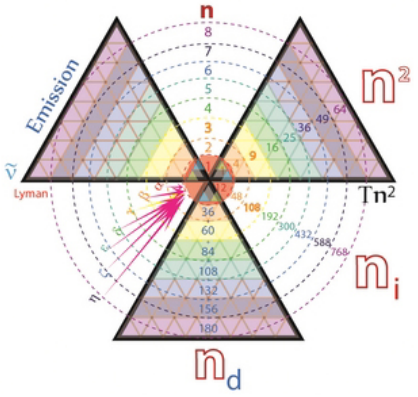
91.714 nm



-13.5252 eV



$$\frac{\left(n_d/n\right)}{n^2}$$



KEM Photon Wavelengths

Lyman Series

α	n1-2	122.28
β	n1-3	103.18
γ	n1-4	97.83
δ	n1-5	95.53
ε	n1-6	94.33
ζ	n1-7	93.62
η	n1-8	93.17

UV spectrum

91.714 nm

1,305 kj/mol

n1-2 — 36

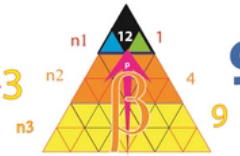
1 quantum level jump

m. [A/c, c/A, c²/A]

λ	122.2866172	nm
ν̃	8,177,509.712	m-1
f	2.451555737 x 10¹⁵	Hz
E	10.14396575	eV
A	36.66060556	m²/s

h/p, p/h, E/h, hf

n1-3 — 90



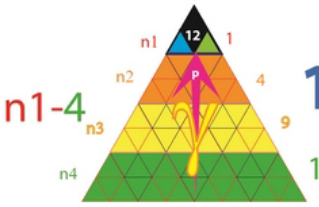
2 quantum level jump

m. [A/c, c/A, c²/A]

λ	103.1793333	nm
ν̃	9,691,863.362	m-1
f	2.90554754 x 10¹⁵	Hz
E	12.02247792	eV
A	30.93238594	m²/s

h/p, p/h, E/h, hf

n1-4 — 180



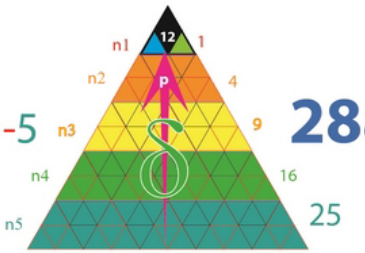
3 quantum level jump

m. [A/c, c/A, c²/A]

λ	97.82929378	nm
ν̃	10,221,5587.14	m-1
f	3.064444671 x 10¹⁵	Hz
E	12.67995718	eV
A	29.32848445	m²/s

h/p, p/h, E/h, hf

n1-5 — 288



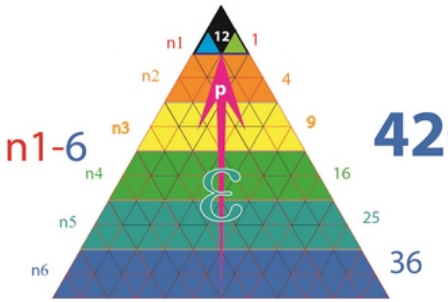
4 quantum level jump

m. [A/c, c/A, c²/A]

λ	95.53641971	nm
ν̃	10,467,212.43	m-1
f	3.137991343 x 10¹⁵	Hz
E	12.98427616	eV
A	28.64109809	m²/s

h/p, p/h, E/h, hf

n1-6 — 420



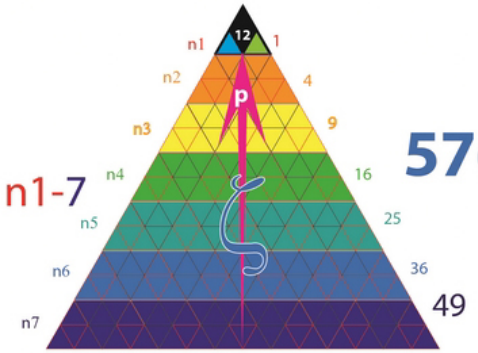
5 quantum level jump

m. [A/c, c/A, c²/A]

λ	94.33539043	nm
ν̃	10,600,475.55	m-1
f	3.177942622 x 10¹⁵	Hz
E	13.14958523	eV
A	28.28103857	m²/s

h/p, p/h, E/h, hf

n1-7 — 576



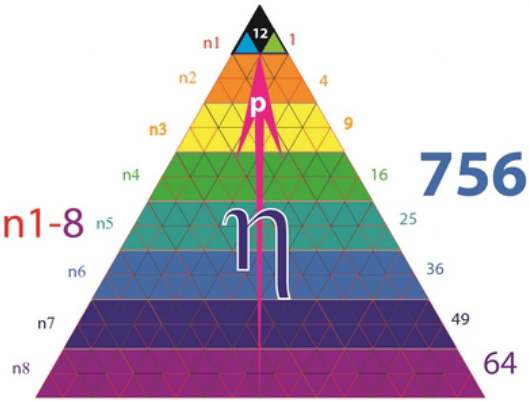
6 quantum level jump

m. [A/c, c/A, c²/A]

λ	93.62569132	nm
ν̃	10,680,829.01	m-1
f	3.202031983 x 10¹⁵	Hz
E	13.24926138	eV
A	28.06827613	m²/s

h/p, p/h, E/h, hf

n1-8 — 756



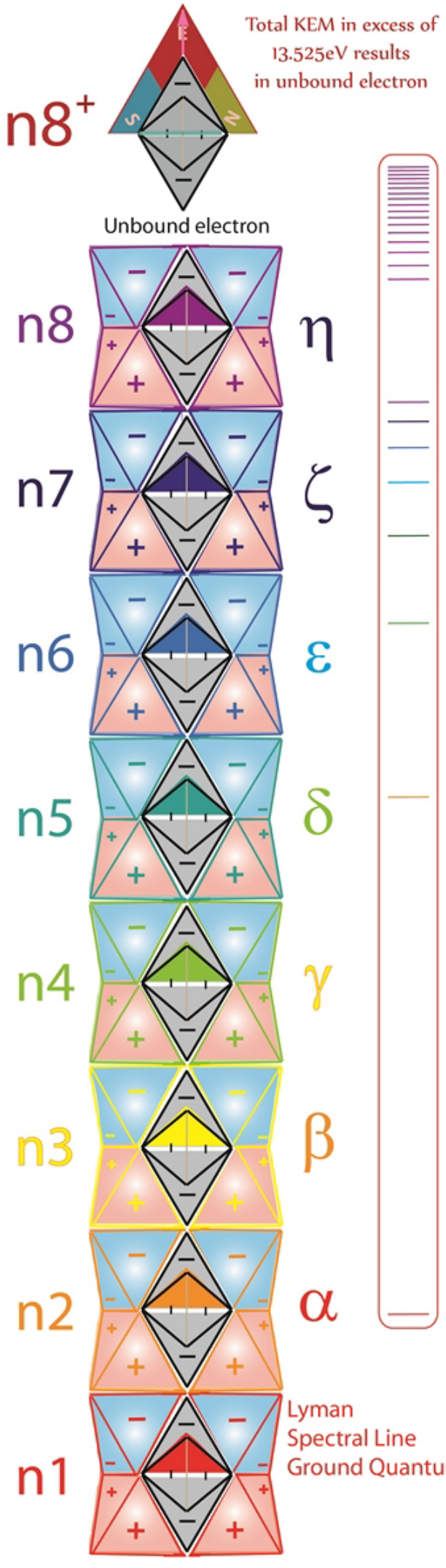
7 quantum level jump

m. [A/c, c/A, c²/A]

λ	93.17075598	nm
ν̃	10,732,981.5	m-1
f	3.217666905 x 10¹⁵	Hz
E	13.31395504	eV
A	27.93188995	m²/s

h/p, p/h, E/h, hf

Lyman Series



m. [A/c, c/A, c²/A]

λ	91.71496292	nm
ν̃	10,903,346.28	m-1
f	3.268740982 x 10^15	Hz
E	13.52528	eV
A	27.49545417	m²/s

h/p
p/h
E/h
hf

12

1,305 kj/mol

63/64
.9843

λ	93.17075598	nm
ν	10,732,981.5	m-1
f	3.217666905 x 10^15	Hz
E	13.31395504	eV
A	27.93188995	m²/s

1,284 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{64}\right)$ .984375

48/49
.9795

λ	93.62569132	nm
ν̃	10,680,829.01	m-1
f	3.202031983 x 10^15	Hz
E	13.24926138	eV
A	28.06827613	m²/s

1,278 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{49}\right)$ .9795

35/36
.9722

λ	94.33539043	nm
ν	10,600,475.55	m-1
f	3.17794262 x 10^15	Hz
E	13.14958523	eV
A	28.28103857	m²/s

1,268 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{36}\right)$ .9722

24/25
.9600

λ	95.53641971	nm
ν	10,467,212.43	m-1
f	3.137991343 x 10^15	Hz
E	12.98427616	eV
A	28.64109809	m²/s

1,252 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{25}\right)$ .96

15/16
.9375

λ	97.82929378	nm
ν̃	10,221,5587.14	m-1
f	3.064444671 x 10^15	Hz
E	12.67995718	eV
A	29.32848445	m²/s

1,223 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{16}\right)$ .9375

8/9
.8888

λ	103.1793333	nm
ν̃	9,691,863.362	m-1
f	2.90554754 x 10^15	Hz
E	12.02247792	eV
A	30.93238594	m²/s

1,160 kj/mol

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{9}\right)$ .888

3/4
.7500

λ	122.2866172	nm
ν̃	8,177,509.712	m-1
f	2.451555737 x 10^15	Hz
E	10.14396575	eV
A	36.66060556	m²/s

978 kj/mol

Rydberg

$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{4}\right)$ .75

LCD

$= R\left(\frac{4}{4} - \frac{3}{4}\right)$ .75

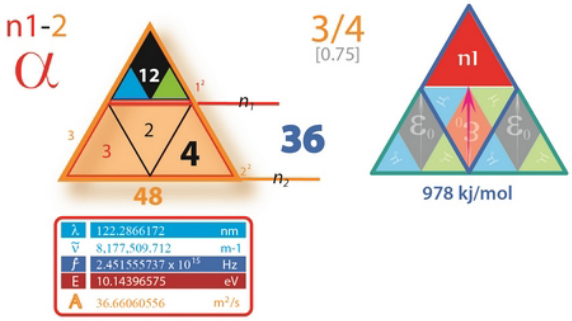
Tetryonic

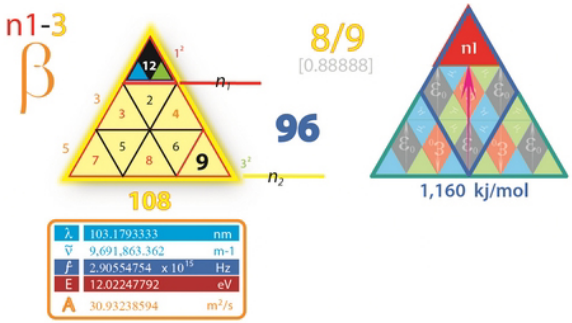
$= R\left(\frac{36/48}{1}\right)$ .75

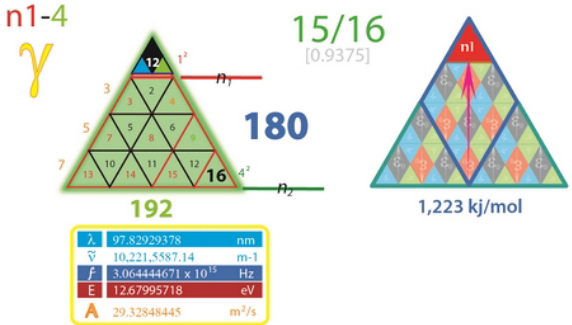
$Mv^2 = KEM = hcR_H$

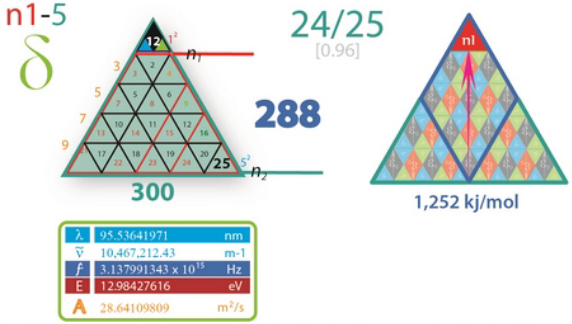
13.525 eV

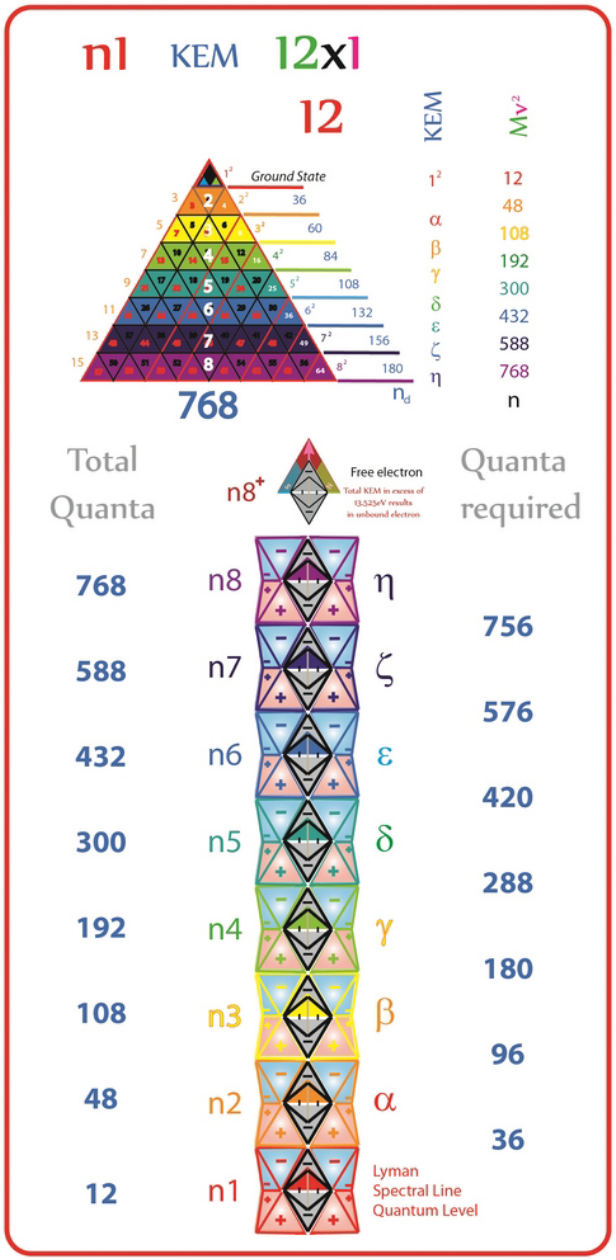
Lyman Series

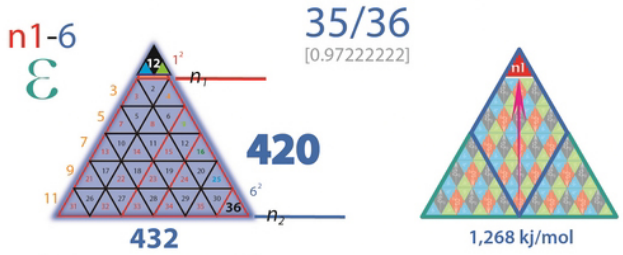


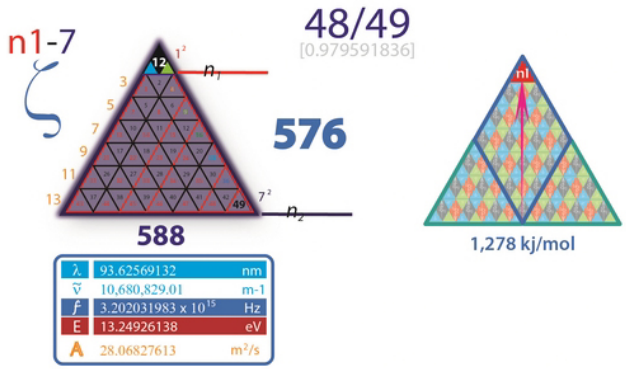


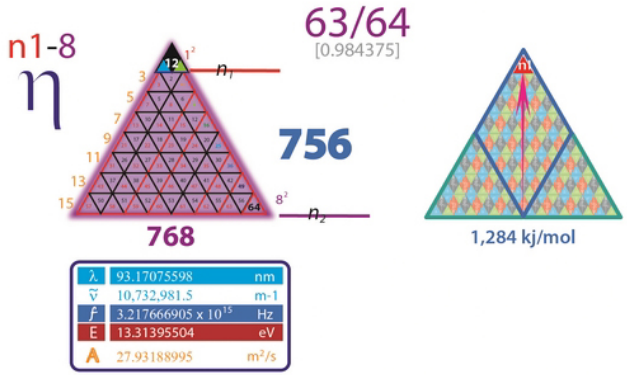


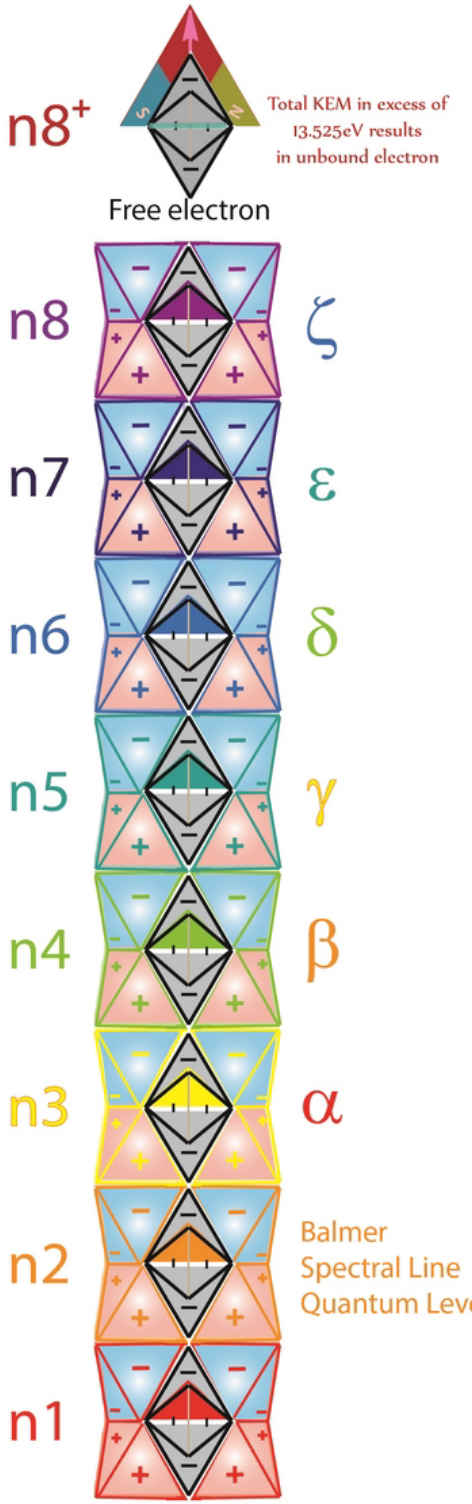










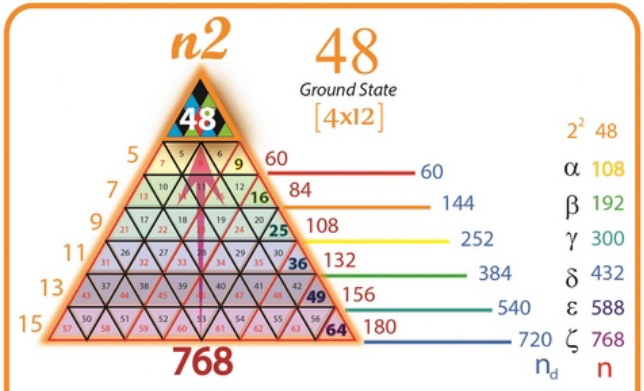


Balmer Series

Series wavenumber - R/n^2

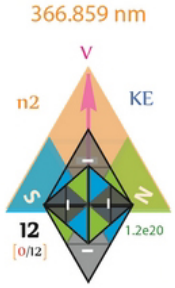
2,725,836.571 m^{-1}

Tn_d	n_d	Emission		Absorption	n_d	Tn_d
180	15	[n2-8]	ζ	[n8-2]	15	720
156	13	[n2-7]	ε	[n7-2]	13	540
132	11	[n2-6]	δ	[n6-2]	11	384
108	9	[n2-5]	γ	[n5-2]	9	252
84	7	[n2-4]	β	[n4-2]	7	144
60	5	[n2-3]	α	[n3-2]	5	60



$$KEM = \frac{hf}{n^2}$$

L shell
Ground Electron
Kinetic Energies



$$KEM = \frac{hcR}{n^2}$$

-3.38125 eV

326.24 kj/mol

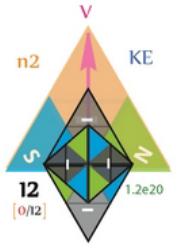
m. [A/c, c/A, c^2/A]

λ	366.8598517	nm	h/p
$\tilde{\nu}$	2,725,836.571	m-1	p/ħ
f	$8.171852456 \times 10^{14}$	Hz	E/h
E	3.381321915	eV	hf
A	109.9818167	m^2/s	

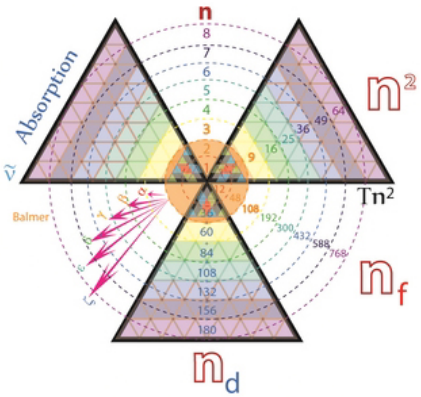
Quantised Angular & Linear momenta provides
the basis for all EM waveform functions

L shell

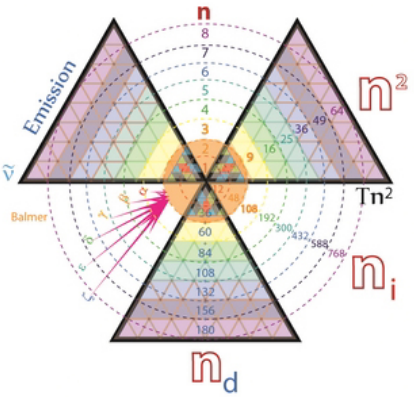
366.859 nm



-3.38125 eV



$$\frac{(n_d/n)}{n^2}$$



KEM Photon Wavelengths

Balmer series

α	n2-3	660.34
β	n2-4	489.14
γ	n2-5	436.73
δ	n2-6	412.71
ε	n2-7	399.46
ϕ	n2-8	391.31

Visible Spectrum

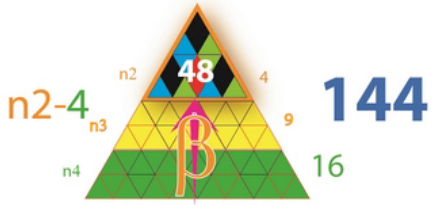
366.859 nm

326.24 kj/mol

m. [A/c, c/A, c²/A]

λ	660.347733	nm
ν̃	1,514,353.65	m-1
f	4.539918031 x 10¹⁴	Hz
E	1.87512175	eV
A	61.10100927	m²/s

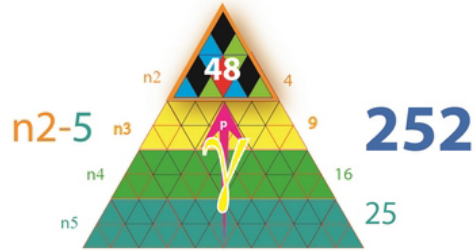
h/p p/h E/h hf



m. [A/c, c/A, c²/A]

λ	489.1464689	nm
ν̃	2,044,377.428	m-1
f	6.128889342 x 10¹⁴	Hz
E	2.535991437	eV
A	82.48636251	m²/s

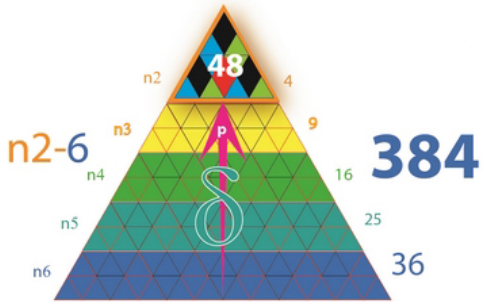
h/p p/h E/h hf



m. [A/c, c/A, c²/A]

λ	436.7379187	nm
ν̃	2,289,702.719	m-1
f	6.864356063 x 10¹⁴	Hz
E	2.840310409	eV
A	92.38472601	m²/s

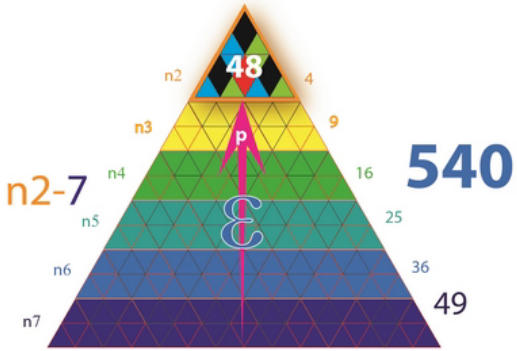
h/p p/h E/h hf



m. [A/c, c/A, c²/A]

λ	412.7173331	nm
ν̃	2,422,965.84	m-1
f	7.26386885 x 10¹⁴	Hz
E	3.00561948	eV
A	97.76161483	m²/s

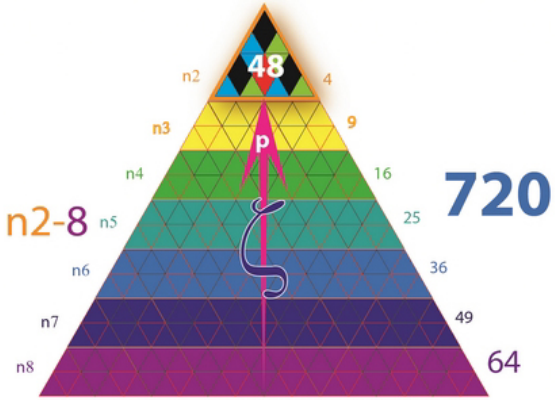
h/p p/h E/h hf



m. [A/c, c/A, c²/A]

λ	399.4696163	nm
~	2,5033,319.299	m-1
f	7.50476246 x 10¹⁴	Hz
E	3.105295637	eV
A	101.0037092	m²/s

h/p p/h E/h hf

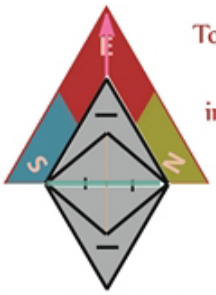


m. [A/c, c/A, c²/A]

λ	391.3171751	nm
ν̃	2,555,471.1785	m-1
f	7.661111677 x 10¹⁴	Hz
E	3.169989296	eV
A	103.1079531	m²/s

h/p p/h E/h hf

Balmer Series



Total KEM in excess of 13.525eV results in unbound electron

n8+

Unbound electron

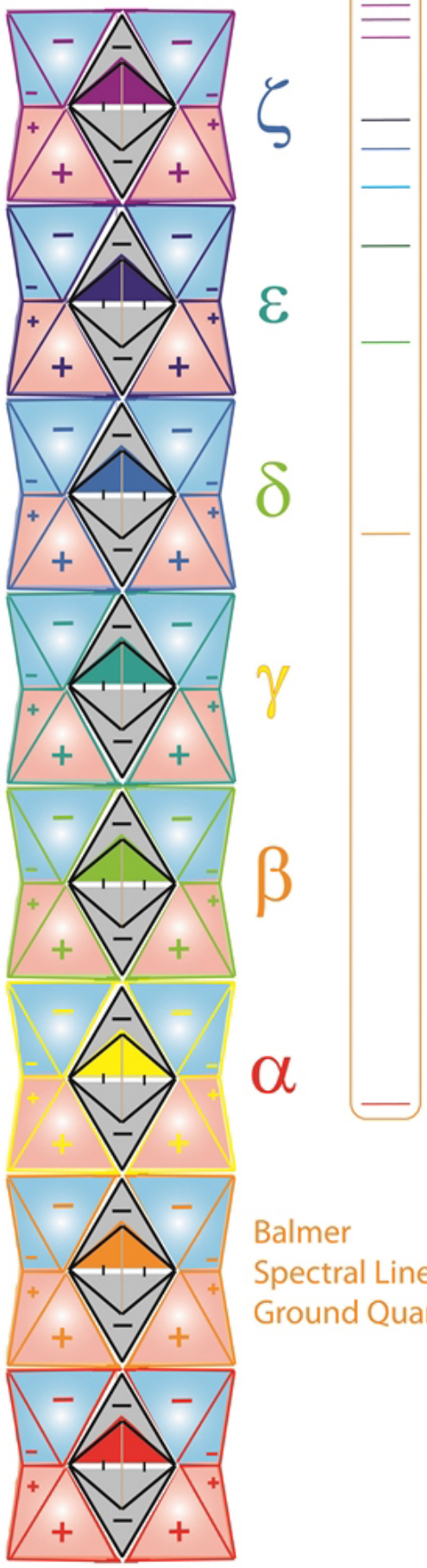
m. [A/c, c/A, c²/A]

λ	366.8598517	nm
ν̃	2,725,836.571	m-1
f	8.171852456 x 10¹⁴	Hz
E	3.381321915	eV
A	109.9818167	m²/s

h/p p/h E/h hf

48

326.24 kj/mol



ζ

60/64

.2343

λ	391.3171751	nm
ν̃	2,555,471.1785	m-1
f	7.661111677 x 10¹⁴	Hz
E	3.169989296	eV
A	103.1079531	m²/s

305.85 kj/mol

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{64}\right)$$ .2343

ε

45/49

.2295

λ	399.4696163	nm
ν̃	2,5033,319.299	m-1
f	7.50476246 x 10¹⁴	Hz
E	3.105295637	eV
A	101.0037092	m²/s

299.61 kj/mol

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{49}\right)$$ .2295

δ

32/36

.2222

λ	412.7173331	nm
ν̃	2,422,965.84	m-1
f	7.26386885 x 10¹⁴	Hz
E	3.00561948	eV
A	97.76161483	m²/s

289.99 kj/mol

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{36}\right)$$ .2222

γ

21/25

.21

λ	436.7379187	nm
ν̃	2,289,702.719	m-1
f	6.864356063 x 10¹⁴	Hz
E	2.840310409	eV
A	92.38472601	m²/s

274.04 kj/mol

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{25}\right)$$ .21

β

12/16

.1875

λ	489.1464689	nm
ν̃	2,044,377.428	m-1
f	6.128889342 x 10¹⁴	Hz
E	2.535991437	eV
A	82.48636251	m²/s

244.68 kj/mol

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{16}\right)$$ .1875

α

5/9

.138

λ	660.347733	nm
ν̃	1,514,353.65	m-1
f	4.539918031 x 10¹⁴	Hz
E	1.878512175	eV
A	61.10100927	m²/s

181.24 kj/mol

Rydberg

$$\frac{1}{\lambda} = R\left(\frac{1}{4} - \frac{1}{9}\right)$$ .138

LCD

$$= R\left(\frac{9}{36} - \frac{4}{36}\right)$$ .138

Tetryonic

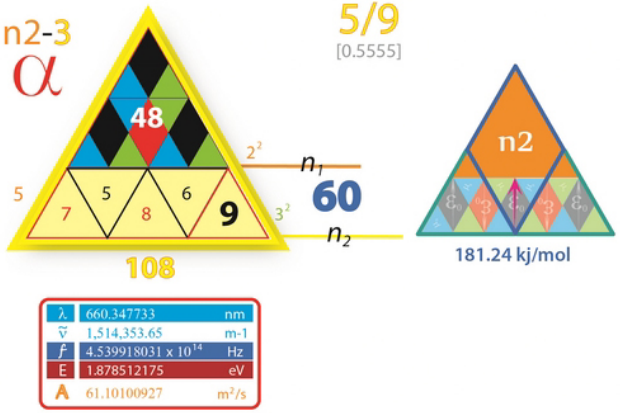
$$= R\left(\frac{60/108}{4}\right)$$ .138

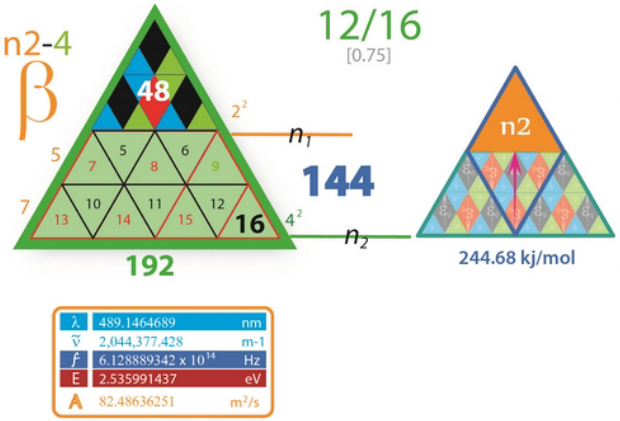
Balmer
Spectral Line
Ground Quantum Level

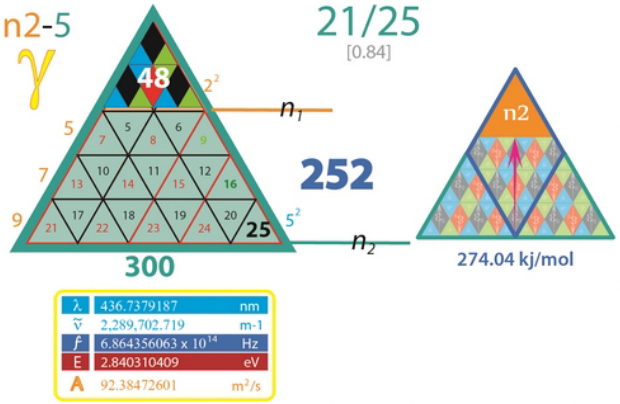
$$Mv^2 = KEM = hcR_H$$

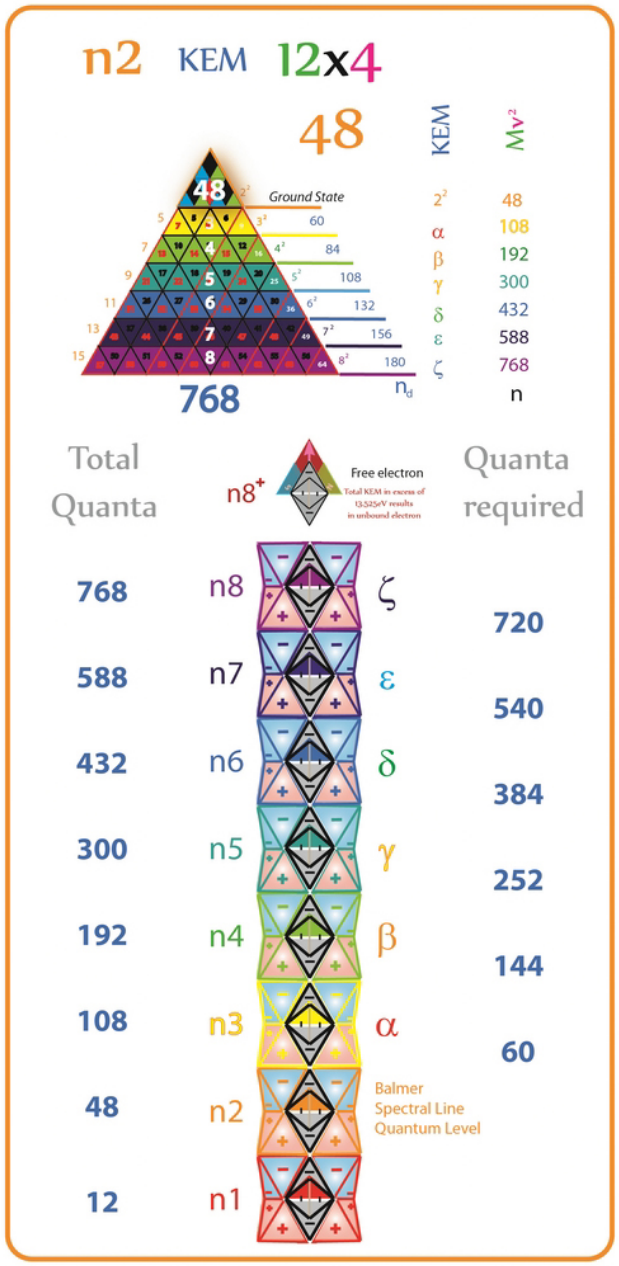
13.525 eV

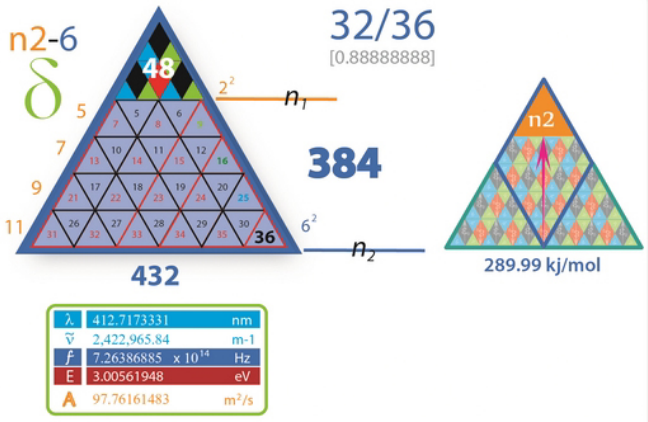
Balmer Series

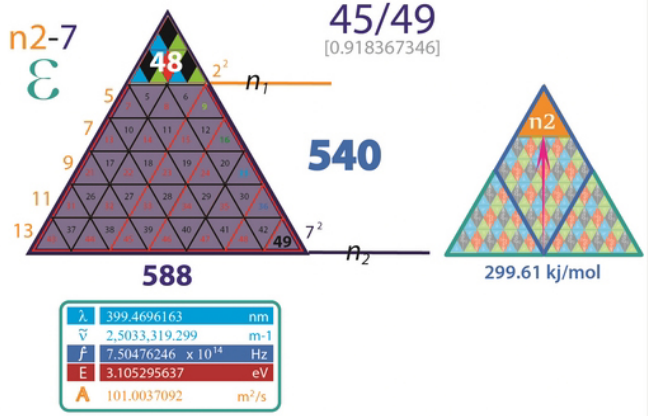


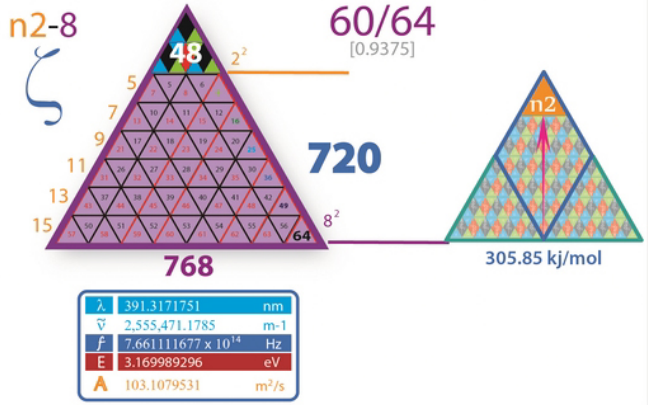


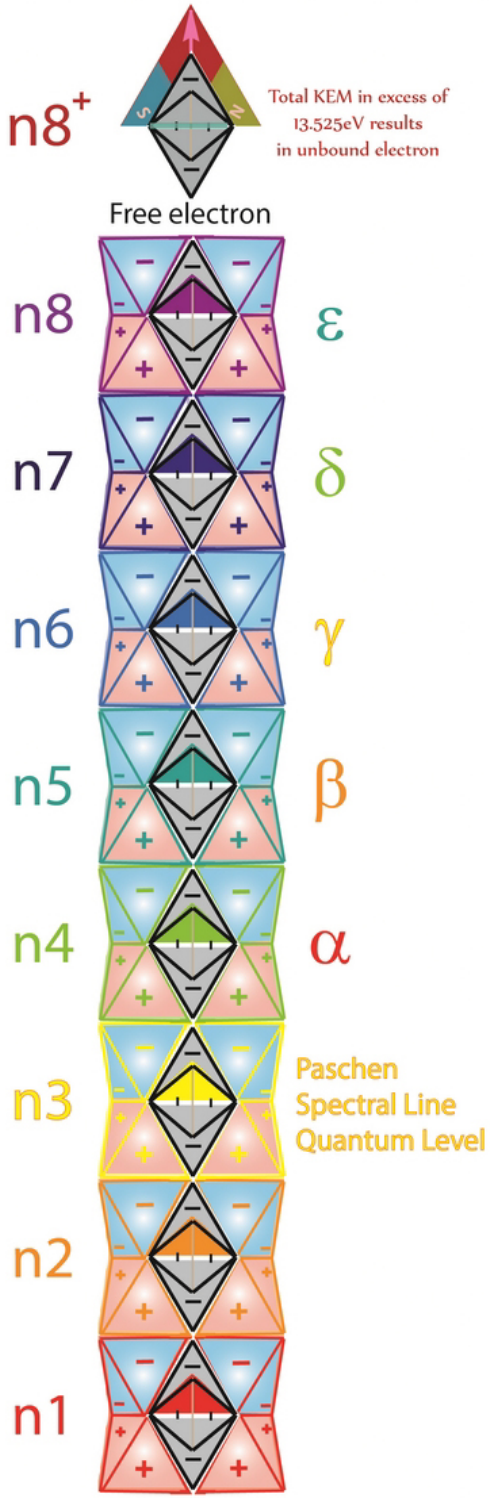










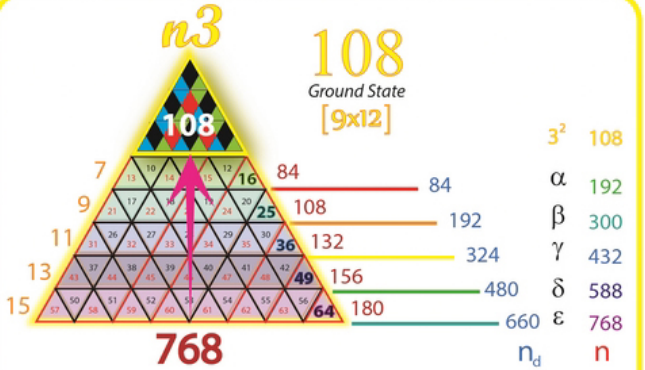


Paschen Series

Series wavenumber - R/n^2

1,211,482.92 m^{-1}

Tn_d	n_d				n_d	Tn_d
		Emission				
180	15	[n3-8]	ε	[n8-3]	15	660
156	13	[n3-7]	δ	[n7-3]	13	480
132	11	[n3-6]	γ	[n6-3]	11	324
108	9	[n3-5]	β	[n5-3]	9	192
84	7	[n3-4]	α	[n4-3]	7	84
		Absorption				

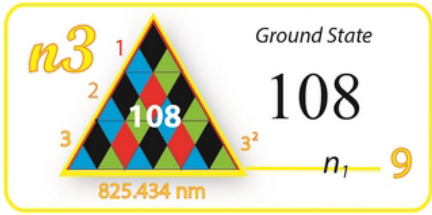


$$KEM = \frac{hf}{n^2}$$

M shell
Ground Electron
Kinetic Energies

$$KEM = \frac{hcR}{n^2}$$

-1.50280974 eV



144.999 kj/mol

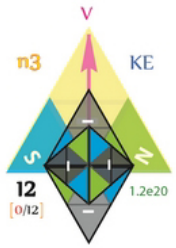
m. [A/c, c/A, c^2/A]

λ	825.4346663	nm	h/p
$\tilde{\nu}$	1,211,482.92	m-1	p/h
f	3.631934425 x 10^{14}	Hz	E/h
E	1.50280974	eV	hf
A	247.4590875	m^2/s	

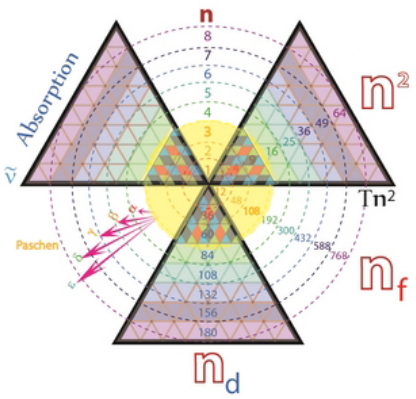
Quantised Angular & Linear momenta provides the basis for all EM waveform functions

M shell

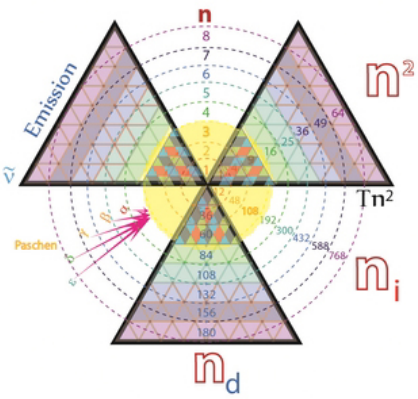
825.434 nm



-1.50280974 eV



$$\frac{\left(n_d/n\right)}{n^2}$$



KEM Photon Wavelengths

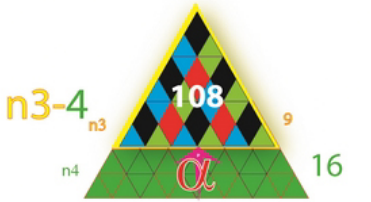
Paschen Series

α	n3-4	1,886
β	n3-5	1,289
γ	n3-6	1,100
δ	n3-7	1,011
ε	n3-8	960

IR spectrum

825.424 nm

144.999 kj/mol



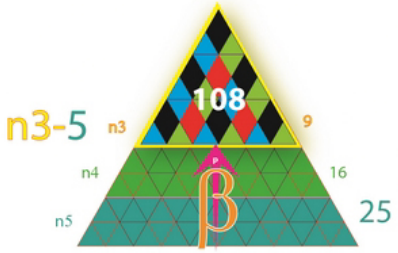
180

1 quantum level jump

m. [A/c, c/A, c²/A]

λ	1,886.707809	nm
$\tilde{\nu}$	530,023.7776	m-1
f	1.588971311 x 10^{14}	Hz
E	0.657479261	eV
A	565.6207715	m^2/s

h/p, p/h, E/h, hf



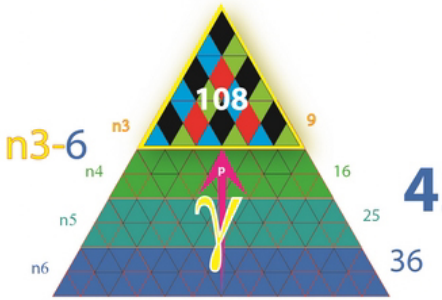
288

2 quantum level jump

m. [A/c, c/A, c²/A]

λ	1,289.741666	nm
$\tilde{\nu}$	775,349.069	m-1
f	2.324438032 x 10^{14}	Hz
E	0.961798233	eV
A	386.6548243	m^2/s

h/p, p/h, E/h, hf



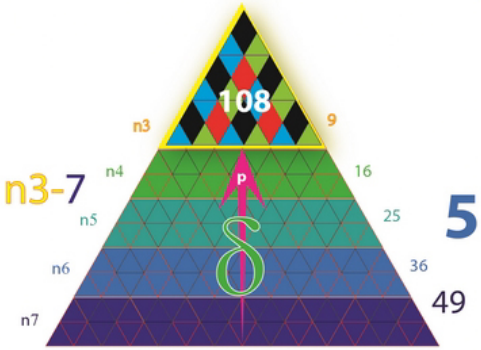
420

3 quantum level jump

m. [A/c, c/A, c²/A]

λ	1,100.579555	nm
$\tilde{\nu}$	908,612.1902	m-1
f	2.723950819 x 10^{14}	Hz
E	1.127107305	eV
A	329.94545	m^2/s

h/p, p/h, E/h, hf



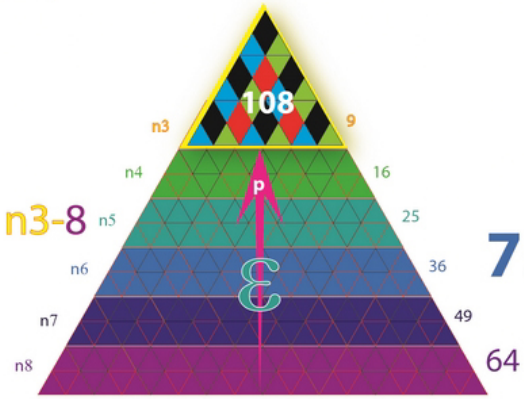
576

4 quantum level jump

m. [A/c, c/A, c²/A]

λ	1,011.157466	nm
$\tilde{\nu}$	988,965.6492	m-1
f	2.9464844428 x 10^{14}	Hz
E	1.226783461	eV
A	303.1373822	m^2/s

h/p, p/h, E/h, hf



756

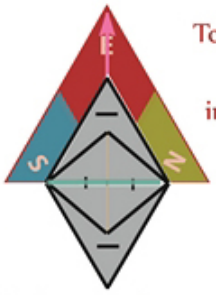
5 quantum level jump

m. [A/c, c/A, c²/A]

λ	960.5057935	nm
$\tilde{\nu}$	1,041,118.135	m-1
f	3.121193646 x 10^{14}	Hz
E	1.29147712	eV
A	287.9523928	m^2/s

h/p, p/h, E/h, hf

Paschen Series



Total KEM in excess of 13.525eV results in unbound electron

$n8^+$

Unbound electron

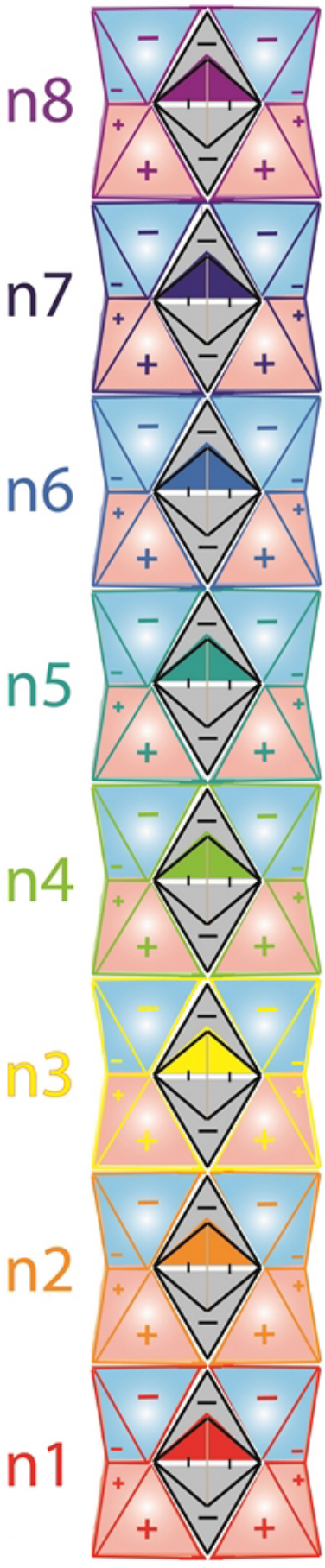
m. [A/c, c/A, c²/A]

λ	825.4346663	nm
ν̃	1,211,482.92	m-1
f	3.631934425 x 10¹⁴	Hz
E	1.50280974	eV
A	247.4590875	m²/s

h/p p/h E/h hf

109

144.999 kj/mol



n8 ε

55/64 .0954

λ	960.5057935	nm
ν̃	1,041,118.135	m-1
f	3.121193646 x 10¹⁴	Hz
E	1.29147712	eV
A	287.9523928	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{9} - \frac{1}{64}\right)$ .09548

n7 δ

40/49 .0907

λ	1,011.157466	nm
ν̃	988,965.6492	m-1
f	2.9464844428 x 10¹⁴	Hz
E	1.226783461	eV
A	303.1373822	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{9} - \frac{1}{49}\right)$ .0907

n6 γ

27/36 .8033

λ	1,100.579555	nm
ν̃	908,612.1902	m-1
f	2.723950819 x 10¹⁴	Hz
E	1.127107305	eV
A	329.94545	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{9} - \frac{1}{36}\right)$ .0833

n5 β

16/25 .0711

λ	1,289.741666	nm
ν̃	775,349.069	m-1
f	2.324438032 x 10¹⁴	Hz
E	0.961798233	eV
A	386.6548243	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{9} - \frac{1}{25}\right)$ .0711

n4 α

7/16 .0486

λ	1,886.707809	nm
ν̃	530,023.7776	m-1
f	1.588971311 x 10¹⁴	Hz
E	0.657479261	eV
A	565.6207715	m²/s

Rydberg

$\frac{1}{\lambda} = R\left(\frac{1}{9} - \frac{1}{16}\right)$ .0486

LCD

$= R\left(\frac{16}{144} - \frac{9}{144}\right)$ .0486

Tetryonic

$= R\left(\frac{84/192}{9}\right)$ .0486

n3 Paschen Spectral Line Ground Quantum Level

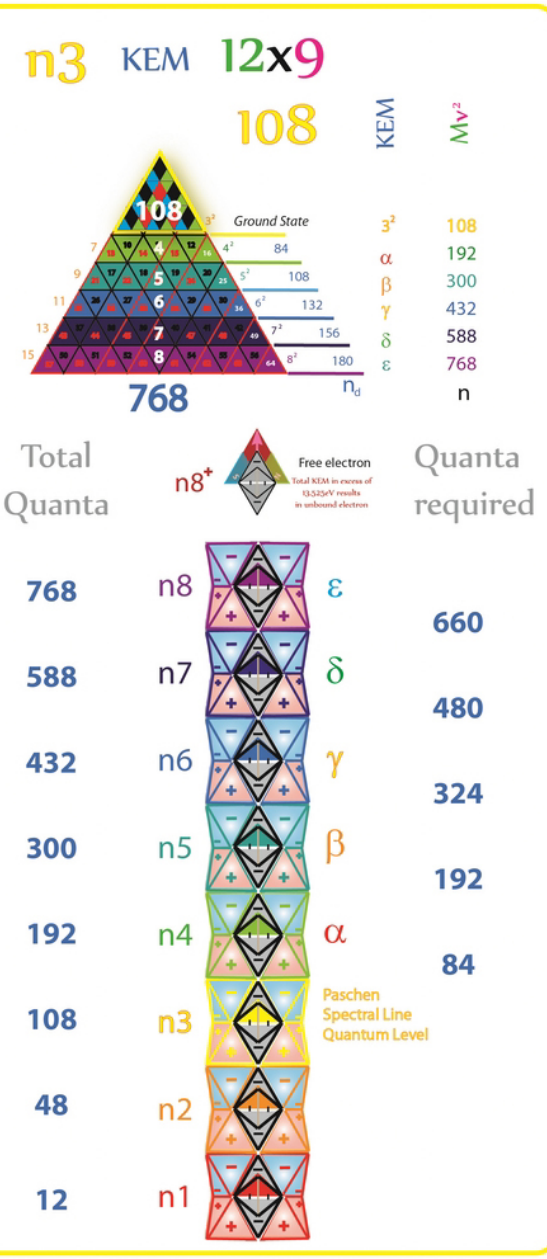
n2

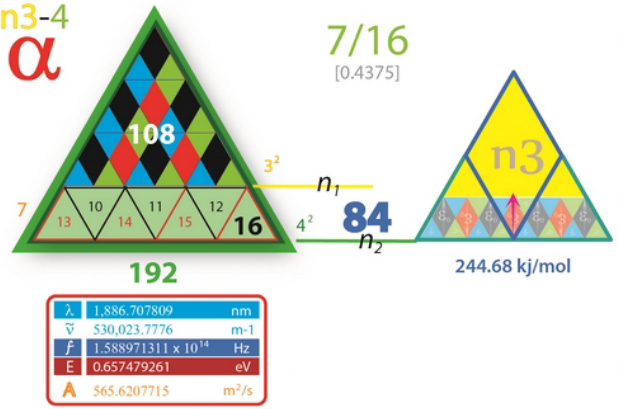
n1

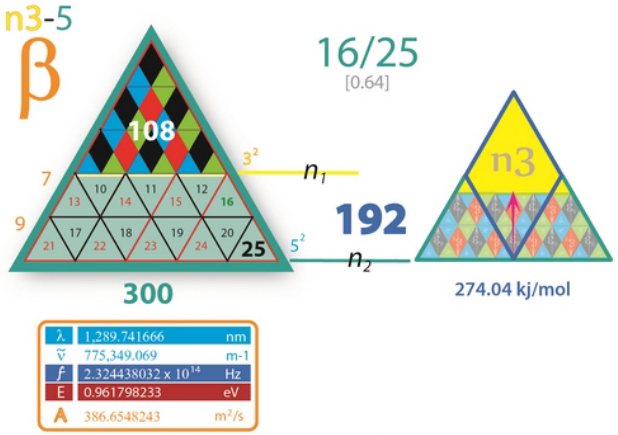
$Mv^2 = KEM = hcR_H$

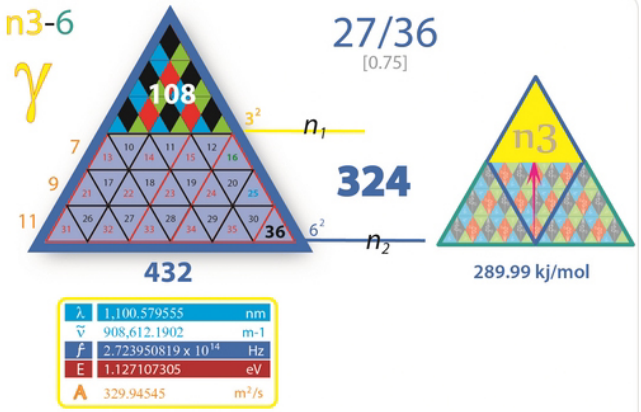
13.525 eV

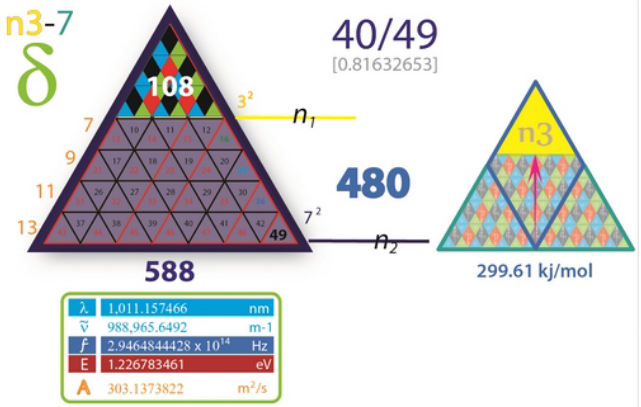
Paschen Series

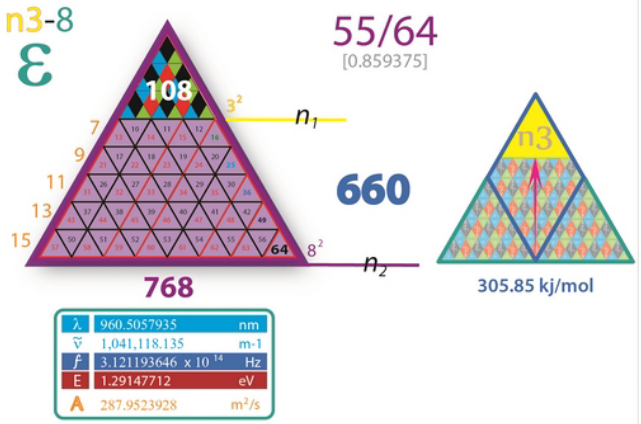








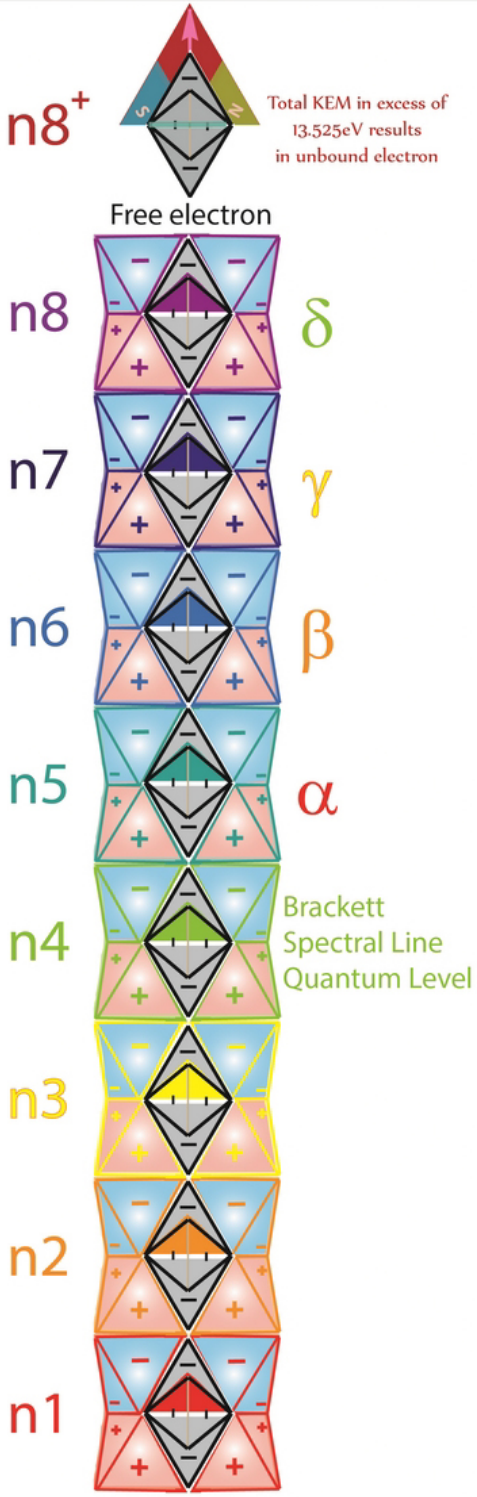


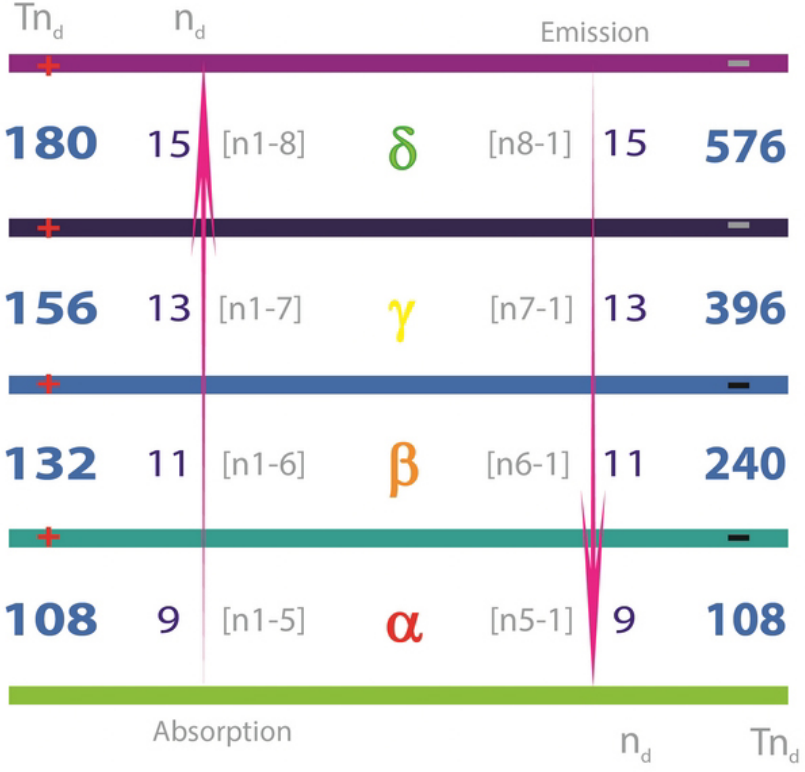


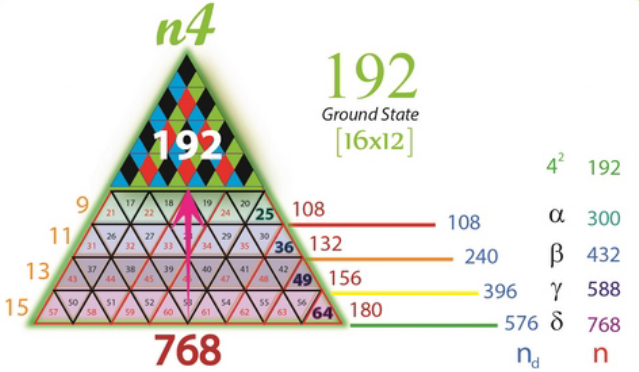
Brackett Series

Series wavenumber - R/n^2

681,456.1426 m^{-1}

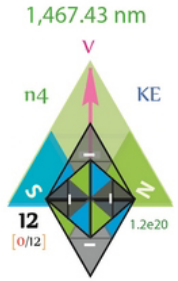






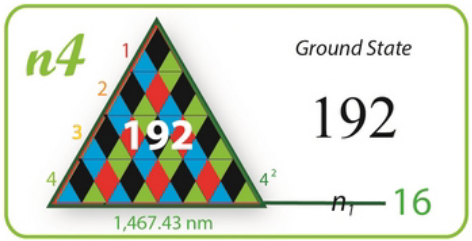
$$KEM = \frac{hf}{n^2}$$

N shell
Ground Electron
Kinetic Energies



-0.84533478 eV

$$KEM = \frac{hcR}{n^2}$$



81.5619971 kj/mol

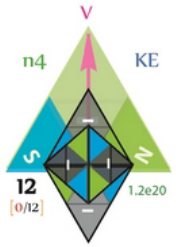
m. [A/c, c/A, c²/A]

λ	1,467.439407	nm	h/p
$\tilde{\nu}$	681,459.1426	m-1	p/h
f	$2.042963114 \times 10^{14}$	Hz	E/h
E	0.84533478	eV	hf
A	439.9272667	m^2/s	

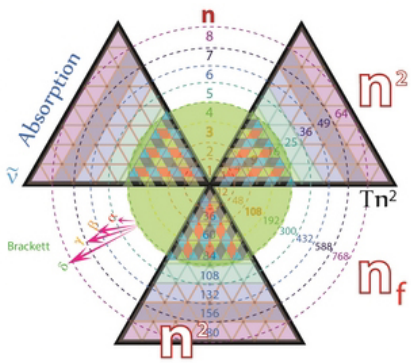
Quantised Angular & Linear momenta provides the basis for all EM waveform functions

N shell

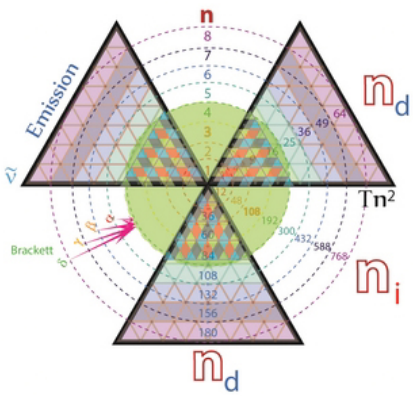
1,467.43 nm



-0.84533478 eV



$$\frac{\left(n_d/n\right)}{n^2}$$



KEM Photon Wavelengths

Brackett Series

α	n4-5	4,076
β	n4-6	2,641
γ	n4-7	2,178
δ	n4-8	1,956

IR spectrum

1,416.43 nm

0.8453 kj/mol

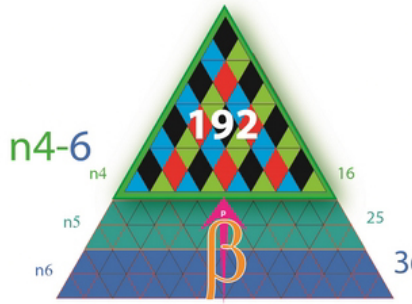
288

1 quantum level jump

m. [A/c, c/A, c²/A]

λ	4,076.220574	nm
$\tilde{\nu}$	245,325.2914	m-1
f	7.35466721x 10 13	Hz
E	0.30432052	eV
A	1,222.020185	m²/s

h/p p/h E/h hf



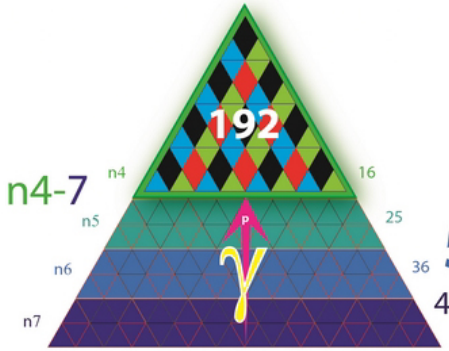
420

2 quantum level jump

m. [A/c, c/A, c²/A]

λ	2,641.390932	nm
$\tilde{\nu}$	378,588.4126	m-1
f	1.134979508 x 10 14	Hz
E	0.469630433	eV
A	791.8690801	m²/s

h/p p/h E/h hf



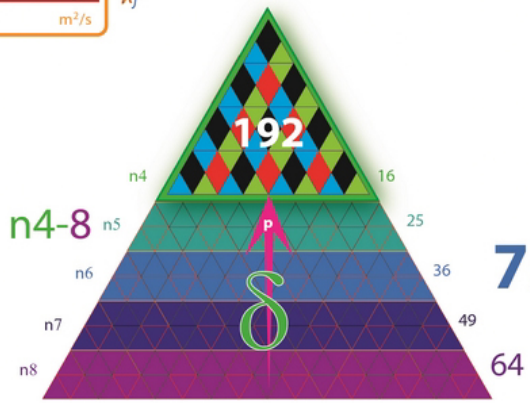
576

3 quantum level jump

m. [A/c, c/A, c²/A]

λ	2,178.92518	nm
$\tilde{\nu}$	458,941.8716	m-1
f	1.375873118 x 10 14	Hz
E	0.569307096	eV
A	653.2253354	m²/s

h/p p/h E/h hf



756

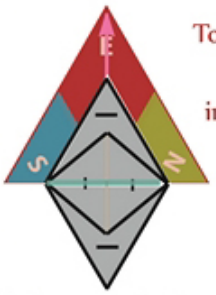
4 quantum level jump

m. [A/c, c/A, c²/A]

λ	1,956.585876	nm
$\tilde{\nu}$	511,094.357	m-1
f	1.532222335 x 10 14	Hz
E	0.634001085	eV
A	586.569689	m²/s

h/p p/h E/h hf

Brackett Series



$n8^+$

Total KEM in excess of 13.525eV results in unbound electron

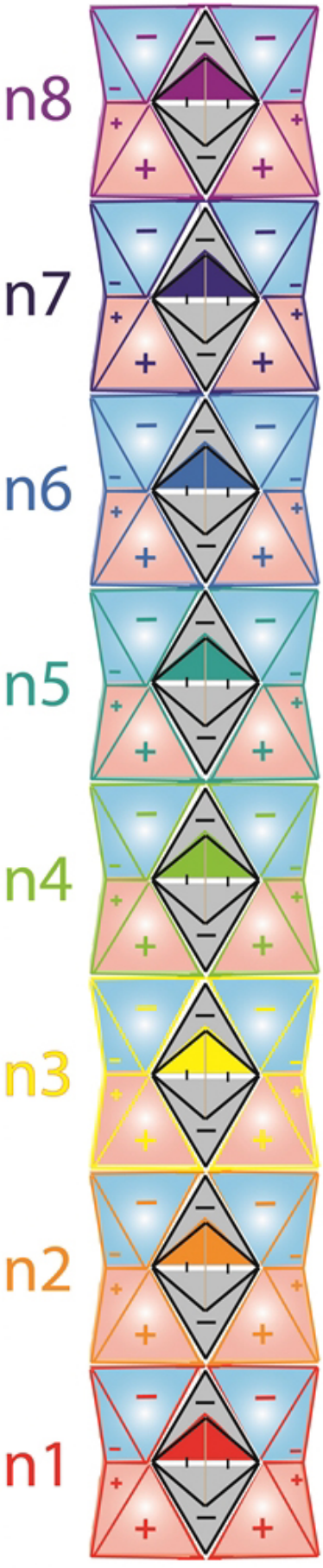
Unbound electron

m. [A/c, c/A, c²/A]

λ	1,467.439407	nm	h/p
ν̃	681,459.1426	m-1	p/ħ
f	2.042963114 x 10^{14}	Hz	E/h
E	0.84533478	eV	hf
A	439.9272667	m^2/s	

192

81.5619971 kj/mol



δ

48/64

.0468

λ	1,956.585876	nm
ν̃	511,094.357	m-1
f	1.532222335 x 10^{14}	Hz
E	0.634001085	eV
A	586.569689	m^2/s

$\frac{1}{\lambda} = R\left(\frac{1}{16} - \frac{1}{64}\right)$ .0468

γ

33/49

.04209

λ	2,178.92518	nm
ν̃	458,941.8716	m-1
f	1.375873118 x 10^{14}	Hz
E	0.569307096	eV
A	653.2253354	m^2/s

$\frac{1}{\lambda} = R\left(\frac{1}{16} - \frac{1}{49}\right)$ .04209

β

20/36

.0347

λ	2,641.390932	nm
ν̃	378,588.4126	m-1
f	1.134979508 x 10^{14}	Hz
E	0.469630433	eV
A	791.8690801	m^2/s

$\frac{1}{\lambda} = R\left(\frac{1}{16} - \frac{1}{36}\right)$ .0347

α

9/25

.0225

λ	4,076.220574	nm
ν̃	245,325.2914	m-1
f	7.35466721x 10^{13}	Hz
E	0.30432052	eV
A	1,222.020185	m^2/s

Rydberg

$\frac{1}{\lambda} = R\left(\frac{1}{16} - \frac{1}{25}\right)$ .0225

Brackett
Spectral Line
Ground Quantum Level

LCD

$= R\left(\frac{25}{400} - \frac{16}{400}\right)$ .0225

Tetryonic

$= R\left(\frac{16 \diagup 25}{16}\right)$ .0225

$Mv^2 = KEM = hcR_H$

13.525 eV

Brackett Series

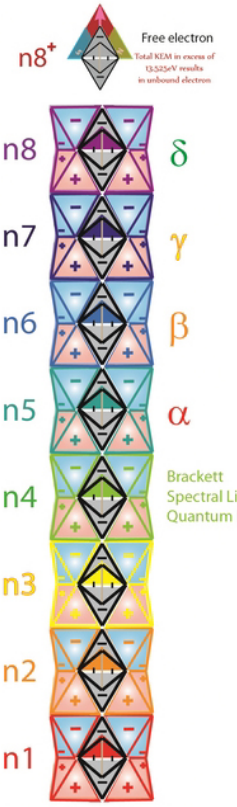
n4 KEM 12x16

192

KEM	Mv^2
4^2	192
α	300
β	432
γ	588
δ	768
n	

Total Quanta

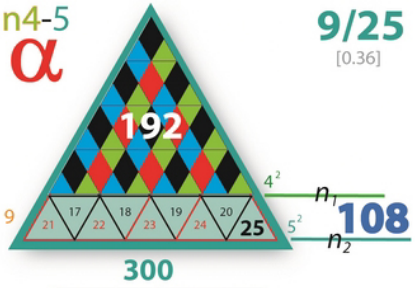
Quanta required



n4-5 α

9/25

[0.36]



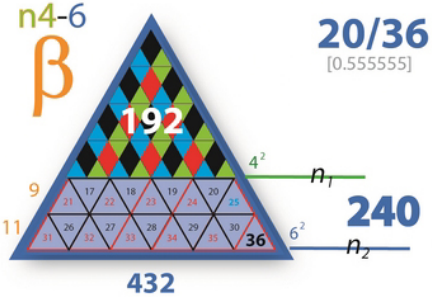
29.36 kj/mol

λ	4,076.220574	nm
$\tilde{\nu}$	245,325.2914	m-1
f	7.3546721x 10 13	Hz
E	0.30432052	eV
A	1,222.020185	m^2/s

n4-6 β

20/36

[0.555555]



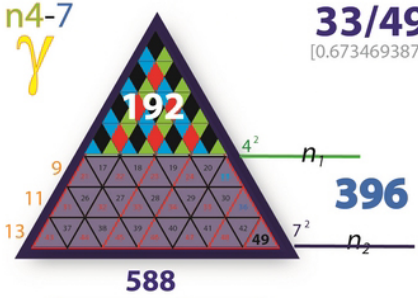
45.31 kj/mol

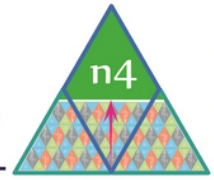
λ	2.641.390932	nm
$\tilde{\nu}$	378,588.4126	m-1
f	1.134979508 x 10^{14}	Hz
E	0.469630433	eV
A	791.8690801	m^2/s

n4-7 γ

33/49

[0.673469387]





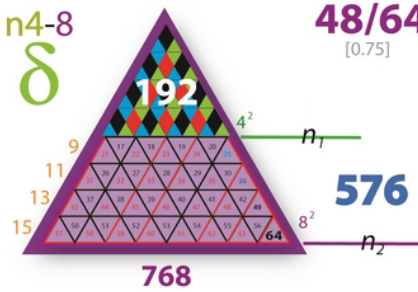
54.92 kj/mol

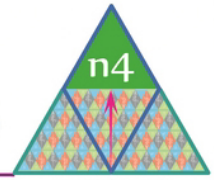
λ	2,178.92518	nm
$\tilde{\nu}$	458,941.8716	m-1
f	1.375873118 x 10^{14}	Hz
E	0.569307096	eV
A	653.2253354	m^2/s

n4-8 δ

48/64

[0.75]





61.17 kj/mol

λ	1,956.585876	nm
$\tilde{\nu}$	511,094.357	m-1
f	1.532222335 x 10^{14}	Hz
E	0.634001085	eV
A	586.569689	

192

λ	1,467.439407	nm
$\tilde{\nu}$	681,459.1426	m-1
f	2.042963114 x 10^{14}	Hz
E	0.84533478	eV
A	439.9272667	m^2/s

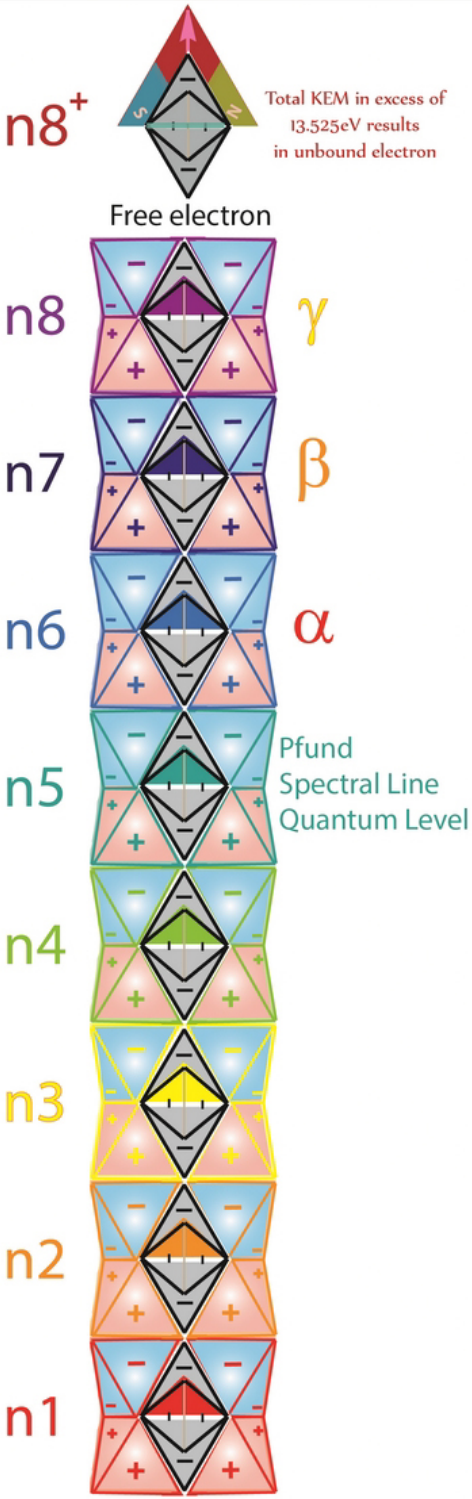
193,536

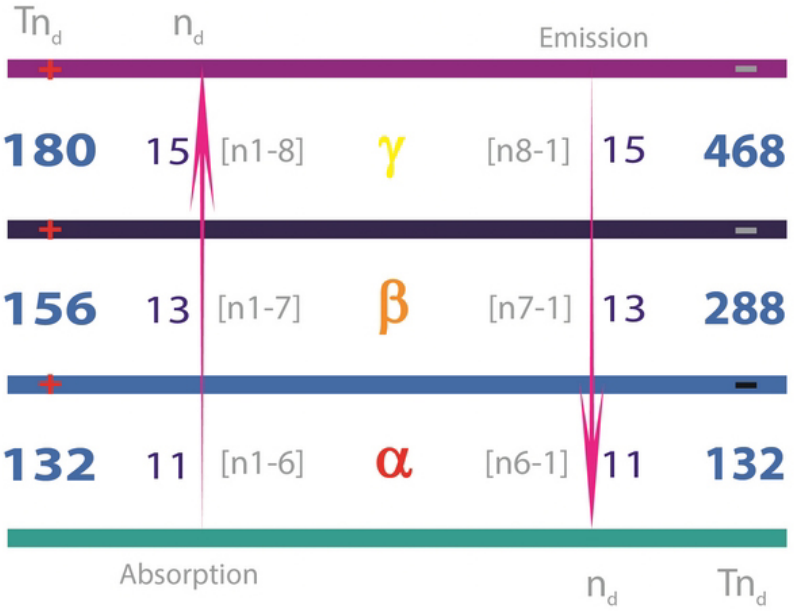
81.5619971 kj/mol

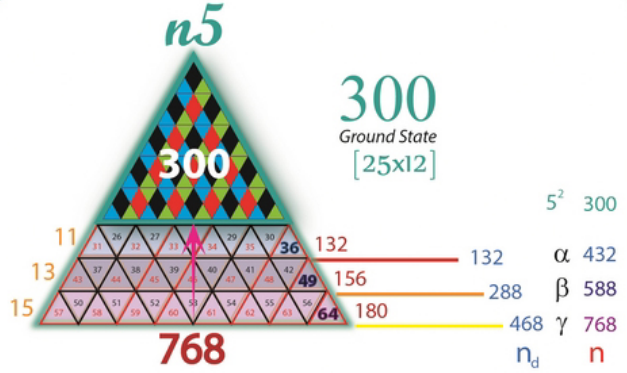
Pfund Series

Series wavenumber - R/n^2

436,133.513 m^{-1}

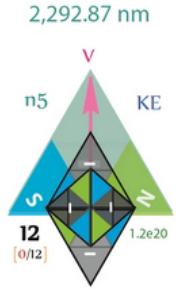






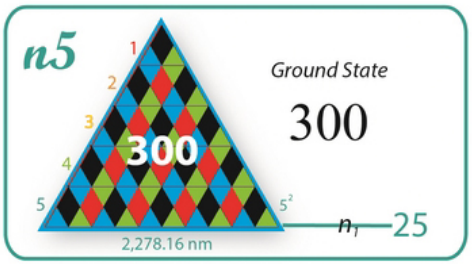
$$KEM = \frac{hf}{n^2}$$

O shell
Ground Electron
Kinetic Energies



$$KEM = \frac{hcR}{n^2}$$

-0.5410115 eV



52.19967815 kj/mol

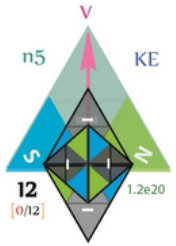
m. [A/c, c/A, c²/A]

λ	2,292.874073	nm	h/p
ν̃	436,133.8513	m-1	p/h
f	1.307496393 x 10^{14}	Hz	E/h
E	0.541011506	eV	hf
A	687.3863542	m^2/s	

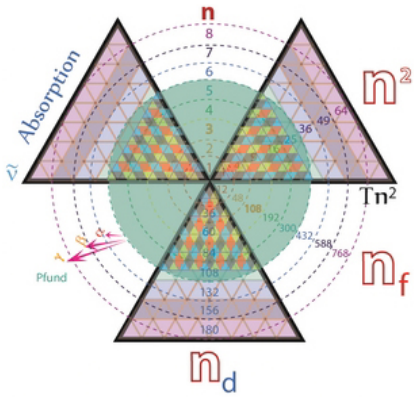
Quantised Angular & Linear momenta provides the basis for all EM waveform functions

O shell

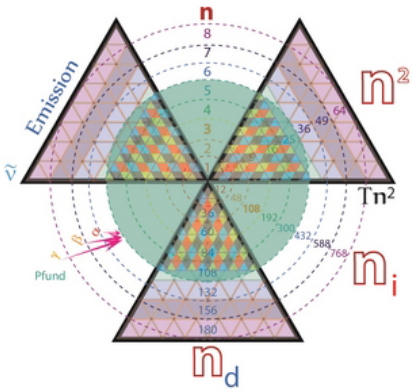
2,292.87 nm



-0.5410115 eV



$$\frac{\left(n_d/n\right)}{n^2}$$



KEM Photon Wavelengths

Pfund Series

α	n5-6	7,503
β	n5-7	4,681
γ	n5-8	3,762

IR spectrum

2,292.87 nm

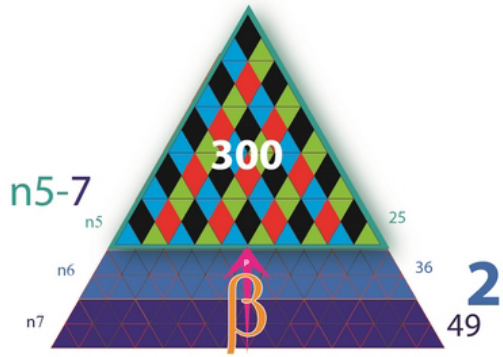
52.1996 kj/mol

132

1 quantum level jump

m. [A/c, c/A, c^2/A]

λ	7,503.951512	nm	h/p
$\tilde{\nu}$	133,263.1212	m-1	p/h
f	3.995127867 x 10^{13}	Hz	E/h
E	0.165309071	eV	hf
A	2,249.628068	m^2/s	

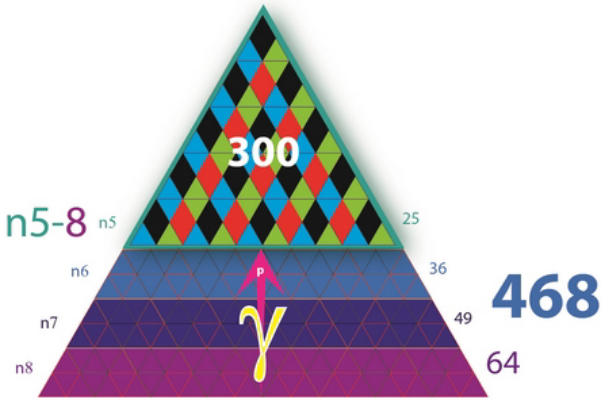


288

2 quantum level jump

m. [A/c, c/A, c^2/A]

λ	4,681.284566	nm	h/p
$\tilde{\nu}$	213,616.5802	m-1	p/h
f	6.404063965 x 10^{13}	Hz	E/h
E	0.264985227	eV	hf
A	1,403.413807	m^2/s	



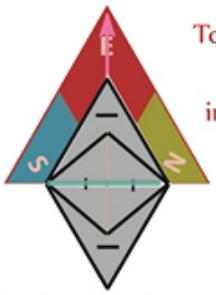
468

3 quantum level jump

m. [A/c, c/A, c^2/A]

λ	3,762.665146	nm	h/p
$\tilde{\nu}$	265,769.0656	m-1	p/h
f	7.967556145 x 10^{13}	Hz	E/h
E	0.329678886	eV	hf
A	1,128.018633	m^2/s	

Pfund Series



n8+

Total KEM in excess of 13.525eV results in unbound electron

Unbound electron

m. [A/c, c/A, c²/A]

λ	2,292.874073	nm
ν̃	436,133.8513	m-1
f	1.307496393 x 10^14	Hz
E	0.541011506	eV
A	687.3863542	m²/s

h/p p/h E/h hf

300

52.19967815 kj/mol

n8 γ

39/64 .0243

λ	3,762.665146	nm
ν̃	265,769.0656	m-1
f	7.967556145 x 10^13	Hz
E	0.329678886	eV
A	1,128.018633	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{25} - \frac{1}{64}\right)$ .0243

n7 β

24/49 .0195

λ	4,681.284566	nm
ν̃	213,616.5802	m-1
f	6.404063965 x 10^13	Hz
E	0.264985227	eV
A	1,403.413807	m²/s

$\frac{1}{\lambda} = R\left(\frac{1}{25} - \frac{1}{49}\right)$ .01959

n6 α

11/36 .0122

λ	7,503.951512	nm
ν̃	133,263.1212	m-1
f	3.995127867 x 10^13	Hz
E	0.165309071	eV
A	2,249.628068	m²/s

Rydberg

$\frac{1}{\lambda} = R\left(\frac{1}{25} - \frac{1}{36}\right)$ .0122

n5

Pfund Spectral Line Ground Quantum Level

LCD

$= R\left(\frac{36}{900} - \frac{25}{900}\right)$ .0122

Tetryonic

$= R\left(\frac{132 \diagup 432}{25}\right)$ .0122

n4

n3

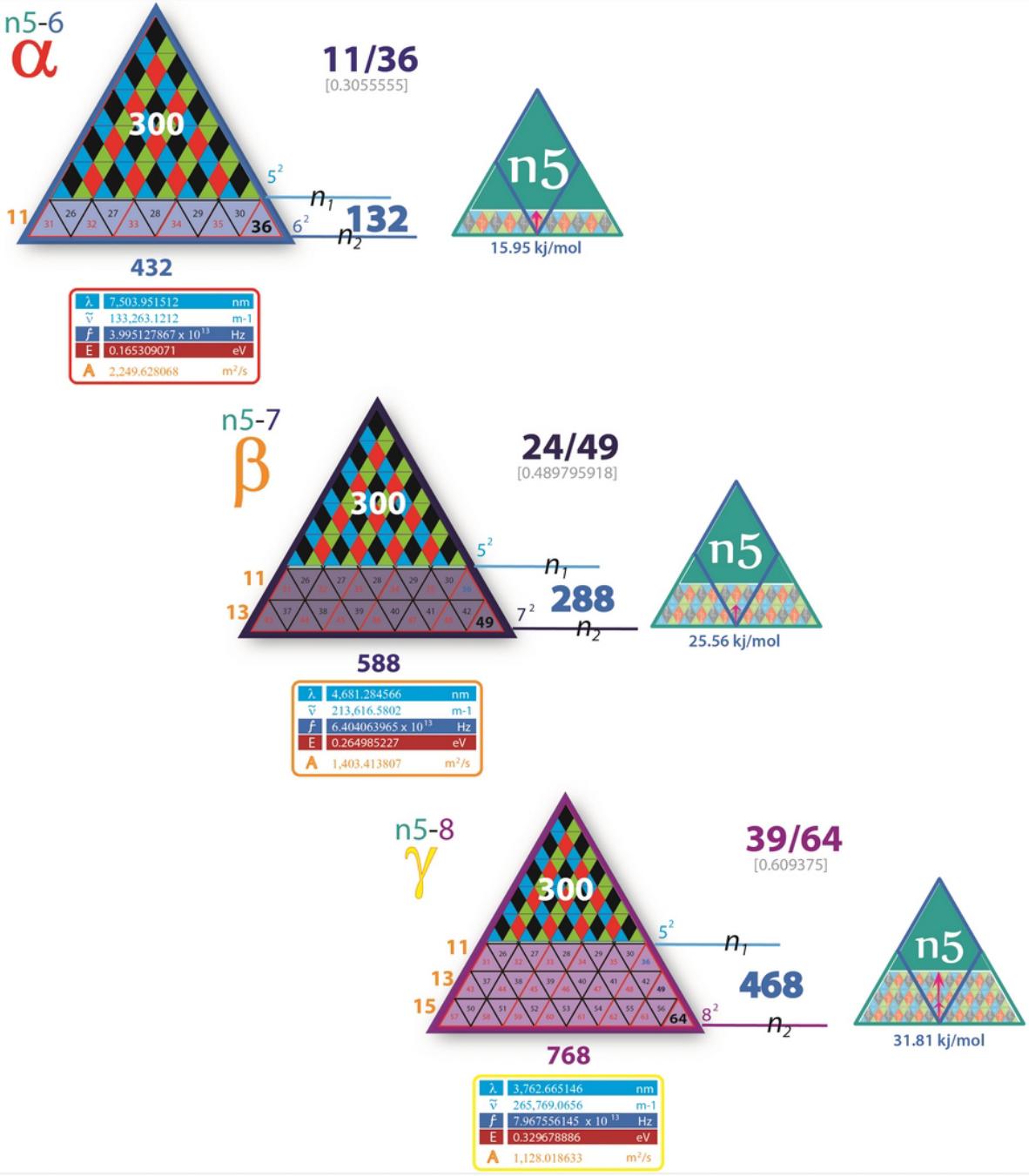
n2

n1

$Mv^2 = KEM = hcR_H$

13.525 eV

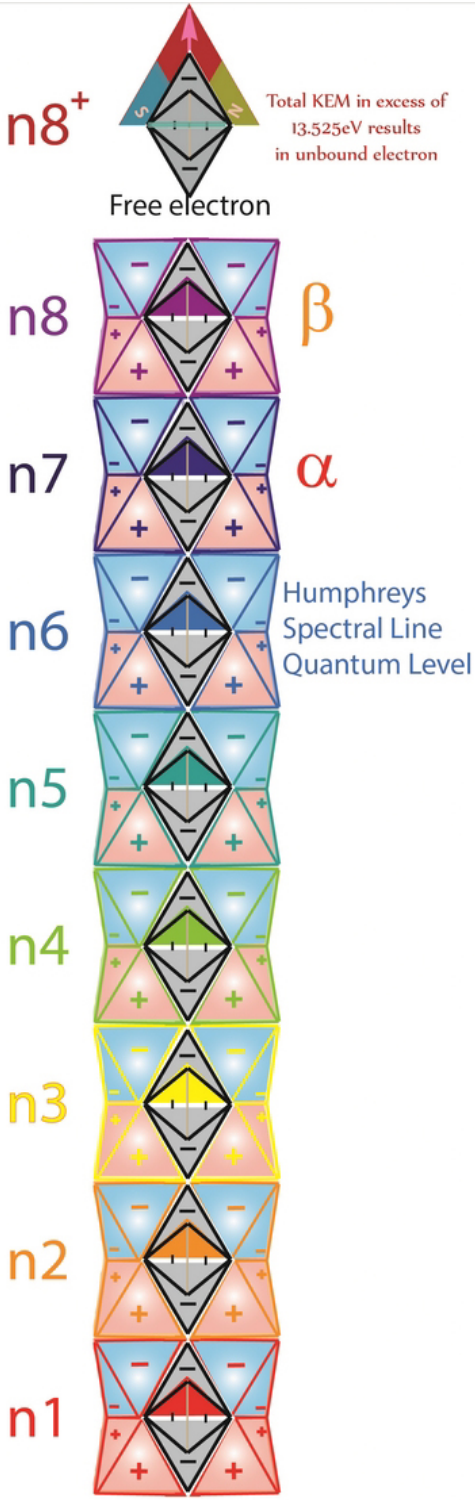
Pfund Series

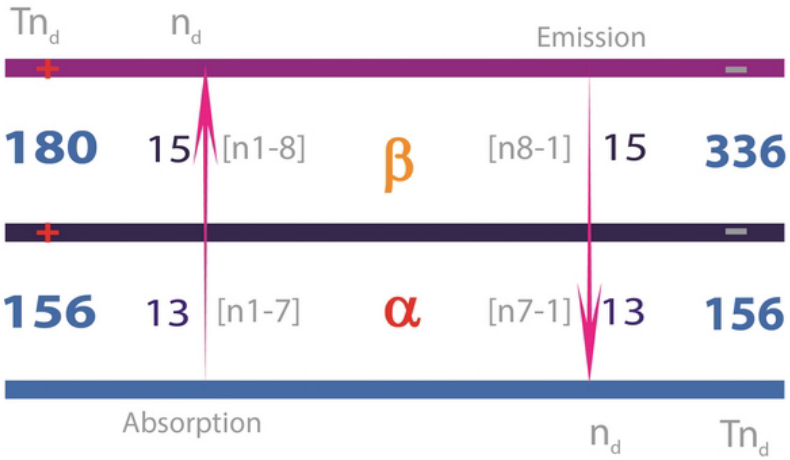


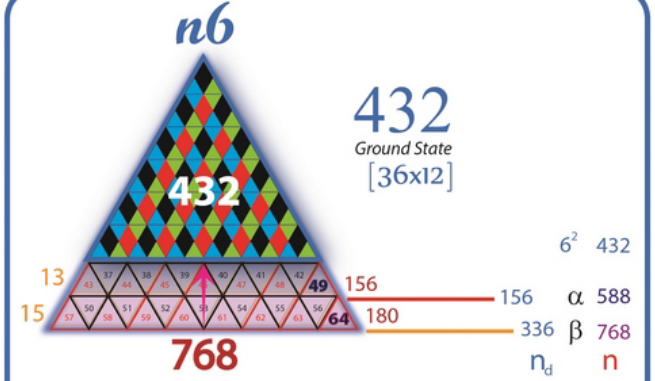
Humphreys Series

Series wavenumber - R/n^2

302,870.73 m^{-1}

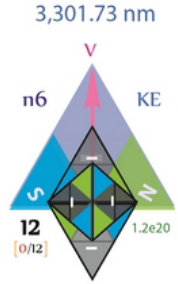






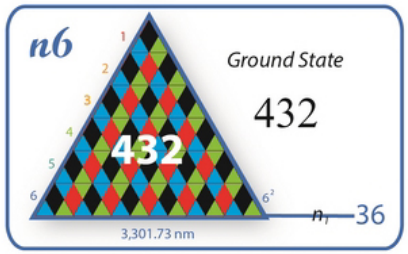
$$KEM = \frac{hf}{n^2}$$

P shell
Ground Electron
Kinetic Energies



-0.375702435 eV

$$KEM = \frac{hcR}{n^2}$$



36.24977648 kj/mol

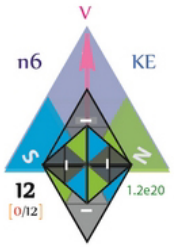
$$m.\begin{bmatrix} A/c \\ c/A \\ c^2/A \end{bmatrix}$$

λ	3,301.738665	nm	h/p
$\tilde{\nu}$	302,870.7301	m-1	p/ħ
f	9.079836062 x 10^{13}	Hz	E/h
E	0.375702435	eV	hf
A	989.8363501	m^2/s	

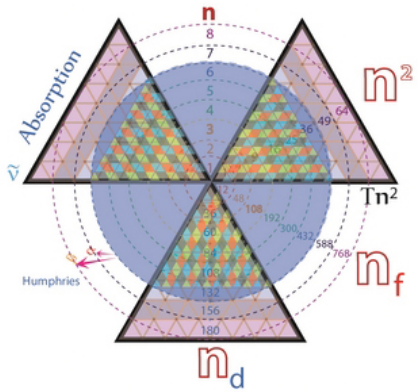
Quantised Angular & Linear momenta provides the basis for all EM waveform functions

P shell

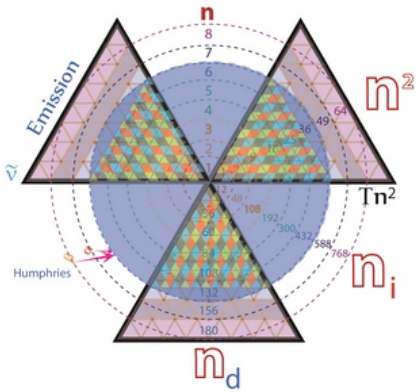
3,301.73 nm



-0.375702435 eV



$$\frac{(n_d/n)}{n^2}$$



KEM Photon Wavelengths

Humphries Series

α n6-7 12,445

β n6-8 7,546

IR spectrum

3.301.73 nm

36.245 kj/mol

156

1 quantum level jump

m. [A/c, c/A, c²/A]

λ	12,445.01497	nm	h/p
$\tilde{\nu}$	80,353.459	m-1	p/h
f	2.4089936098x 10^{13}	Hz	E/h
E	0.099676156	eV	hf
A	1,403.413807	m^2/s	

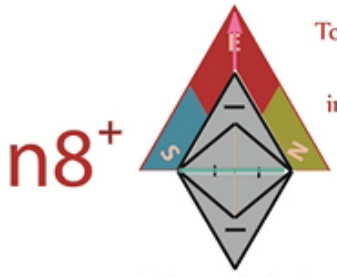
336

2 quantum level jump

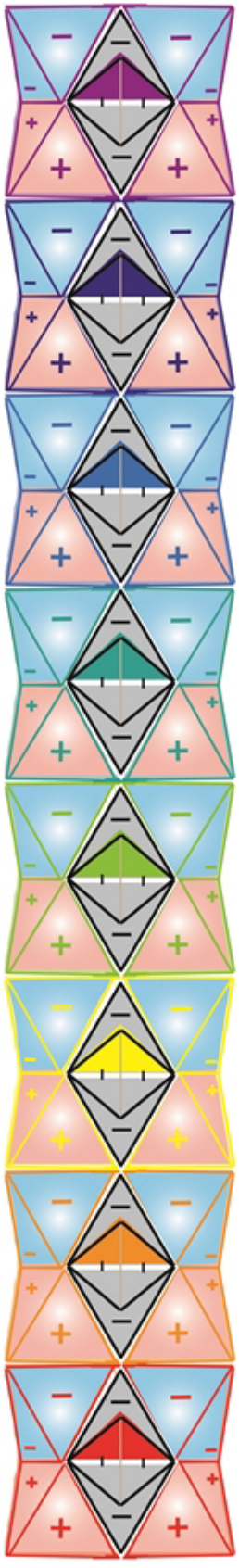
m. [A/c, c/A, c²/A]

λ	7,546.831235	nm	h/p
$\tilde{\nu}$	132,505.9444	m-1	p/h
f	3.972428277 x 10^{13}	Hz	E/h
E	0.164369815	eV	hf
A	1,128.018633	m^2/s	

Humphreys Series



Unbound electron



β

α

Humphreys
Spectral Line
Ground Quantum Level

m. [A/c, c/A, c²/A]

λ	3,301.738665	nm
ν̃	302,870.7301	m-1
f	9.079836062 x 10^13	Hz
E	0.375702435	eV
A	989.8363501	m²/s

h/p
p/h
E/h
hf

432

36.24977648 kj/mol

28/64
.01215

λ	7,546.831235	nm
ν̃	132,505.9444	m-1
f	3.972428277 x 10^13	Hz
E	0.164369815	eV
A	1,128.018633	m²/s

$$\frac{1}{\lambda} = R\left(\frac{1}{36} - \frac{1}{64}\right)$$

.01215

13/49
.00733

λ	12,445.01497	nm
ν̃	80,353.459	m-1
f	2.408993609 8x 10^13	Hz
E	0.099676156	eV
A	1,403.413807	m²/s

Rydberg

$$\frac{1}{\lambda} = R\left(\frac{1}{36} - \frac{1}{49}\right)$$

.0073

LCD

$$= R\left(\frac{49}{1764} - \frac{36}{1764}\right)$$

.0073

Tetryonic

$$= R\left(\frac{13 \diagup 49}{36}\right)$$

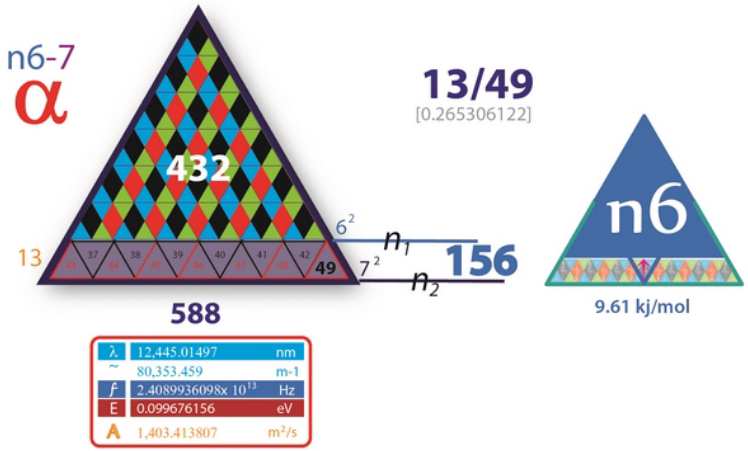
.0073

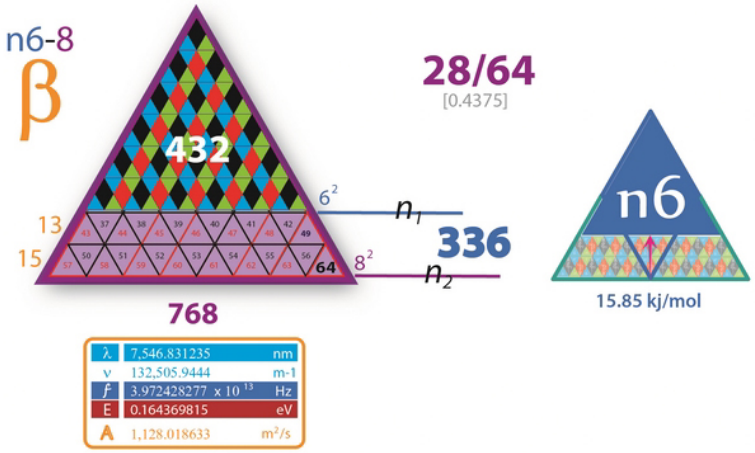
$$Mv^2 = KEM = hcR_H$$

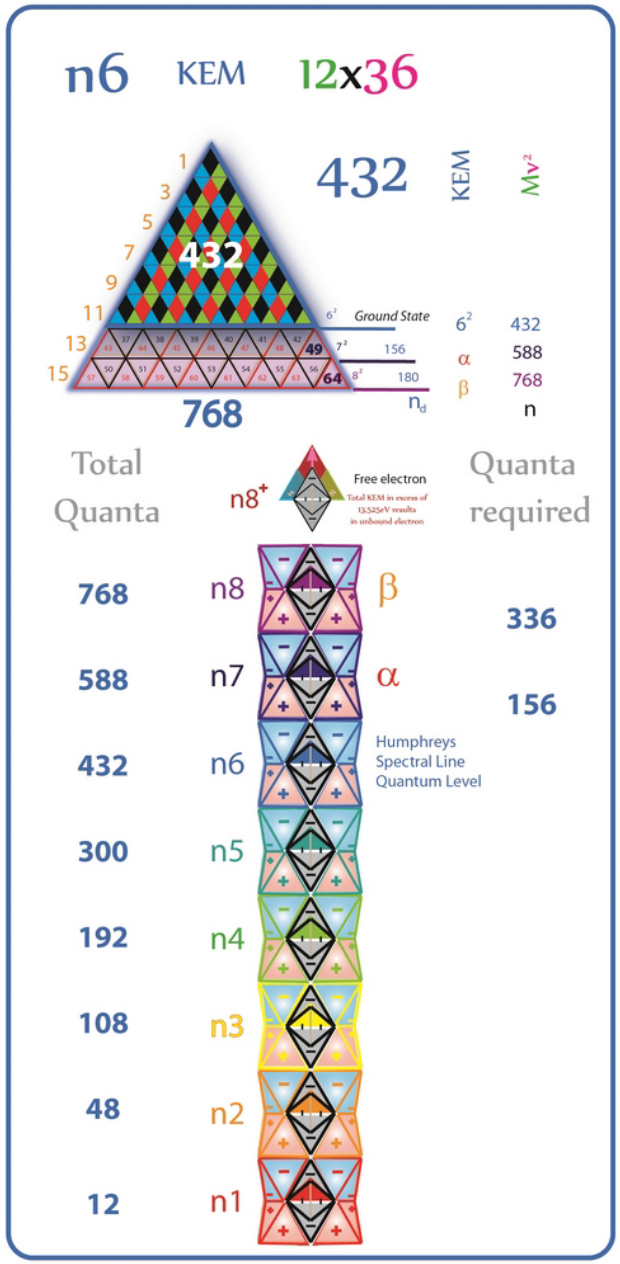
13.525 eV

Free electron

Humphreys Series



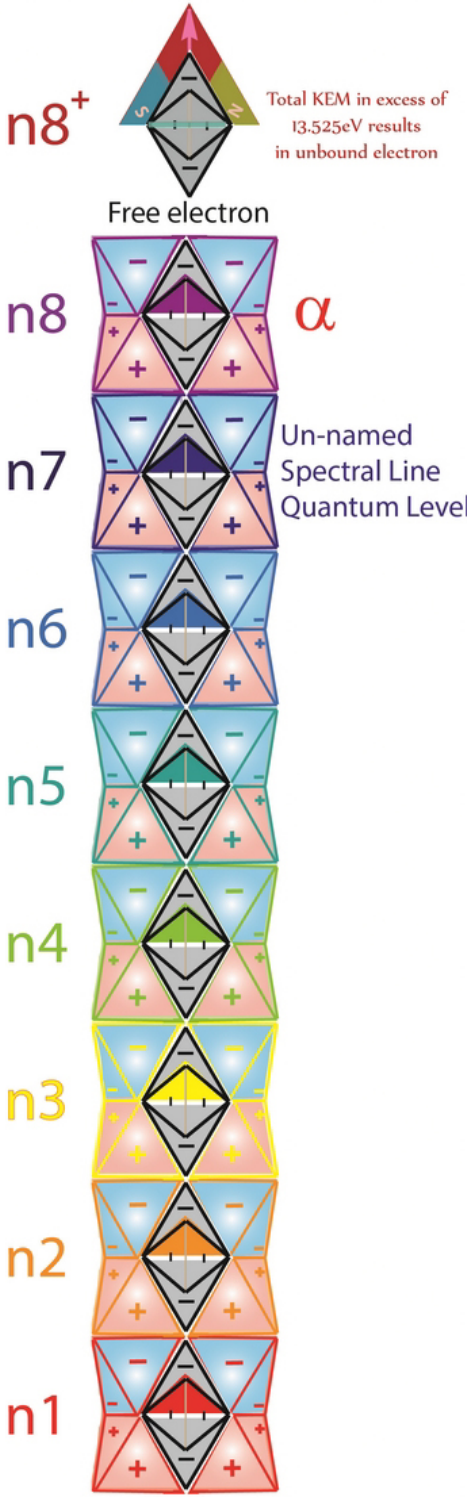


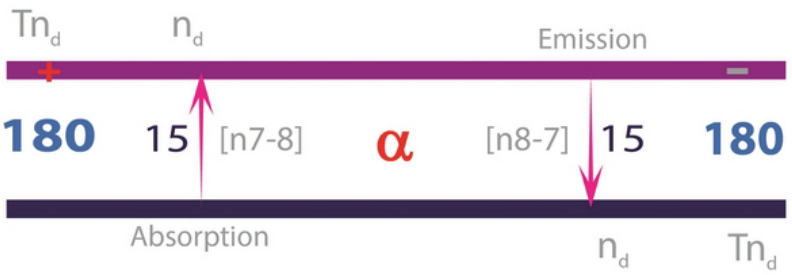


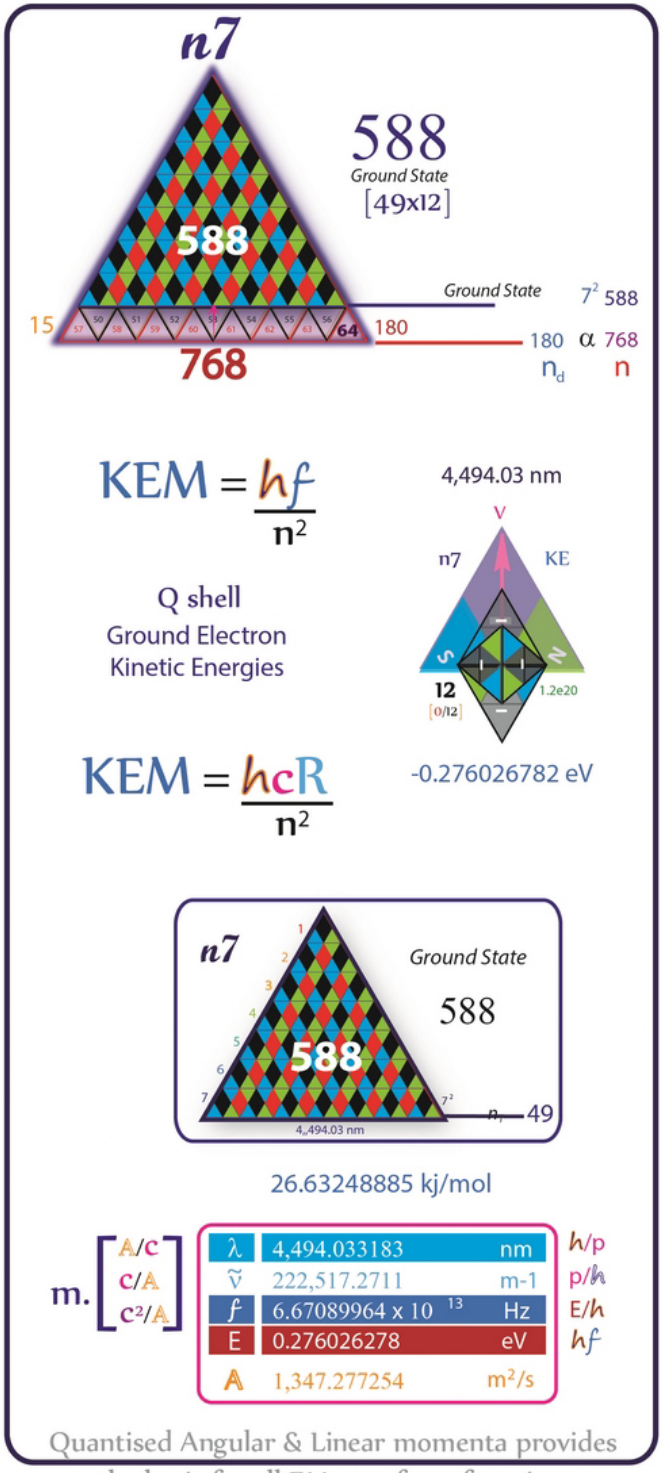
Un-named Series

Series wavenumber - R/n^2

222,517.27 m^{-1}



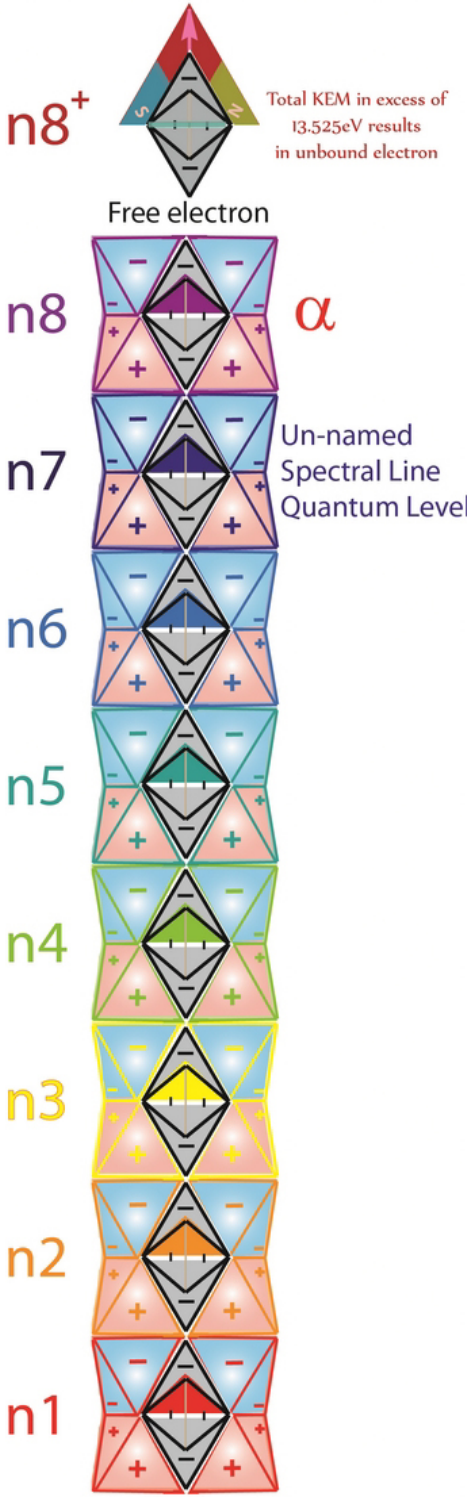


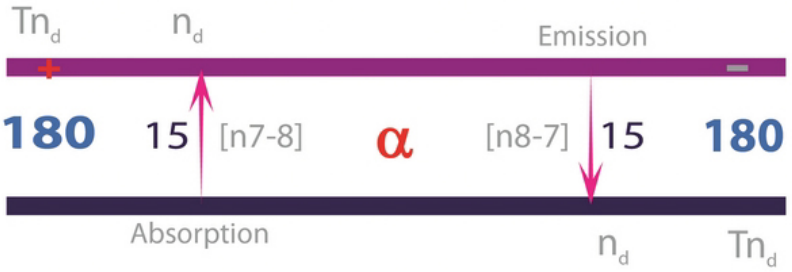


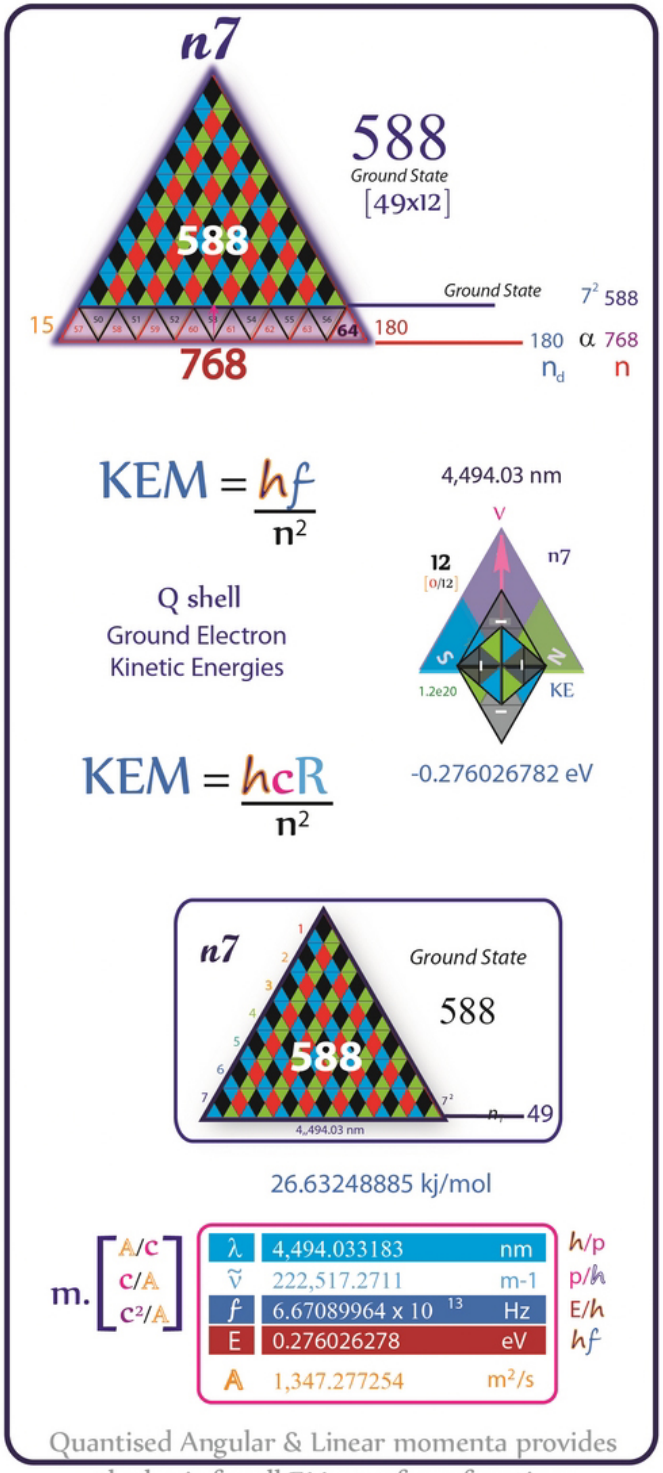
Un-named Series

Series wavenumber - R/n^2

222,517.27 m^{-1}



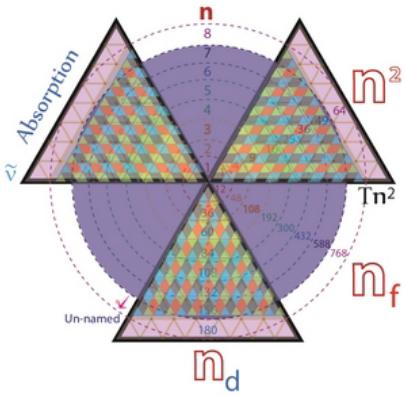




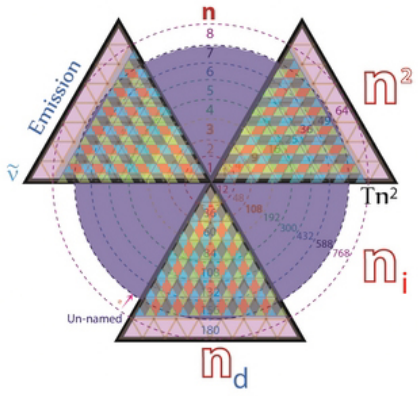
Q shell

4,494.03 nm

-0.276026782 eV



$$\frac{\left(n_d/n\right)}{n^2}$$



KEM Photon Wavelengths

Un-named Series

α n1-8 **19,174**

IR spectrum

4,494.033 nm

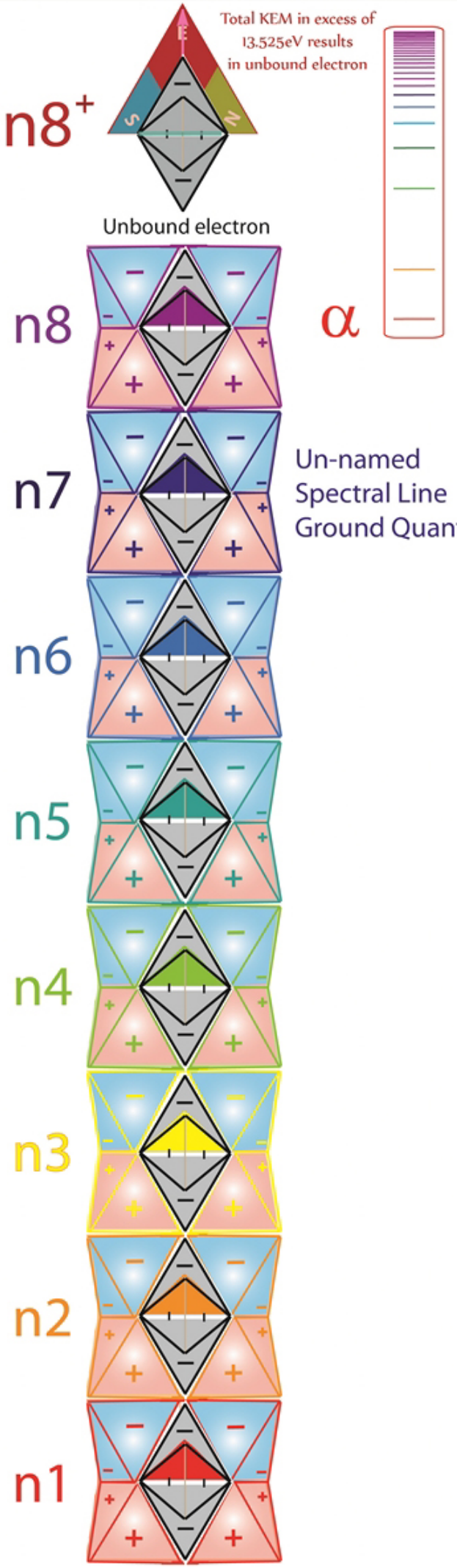
26.63 kj/mol

1 quantum level jump

m. [A/c, c/A, c²/A]

λ	19,174.54158	nm	h/p
$\tilde{\nu}$	52,152.48541	m-1	p/h
f	1.563492179 x 10^{13}	Hz	E/h
E	0.064693658	eV	hf
A	5,748.382952	m^2/s	

Un-named Series



m. [A/c, c/A, c²/A]

λ	4,494.033183	nm
ν̃	222,517.2711	m-1
f	6.67089964 x 10 13	Hz
E	0.276026278	eV
A	1,347.277254	m²/s

h/p
p/h
E/h
hf

588

26.63248885 kj/mol

15/64
.0047

λ	19,174.54158	nm
ν̃	52,152.48541	m-1
f	1.563492179 x 10 13	Hz
E	0.064693658	eV
A	5,748.382952	m²/s

Rydberg

$$\frac{1}{\lambda} = R\left(\frac{1}{49} - \frac{1}{64}\right)$$

.0047

LCD

$$= R\left(\frac{64}{3136} - \frac{49}{3136}\right)$$

.0047

Tetryonic

$$= R\left(\frac{15 \diagup 49}{64}\right)$$

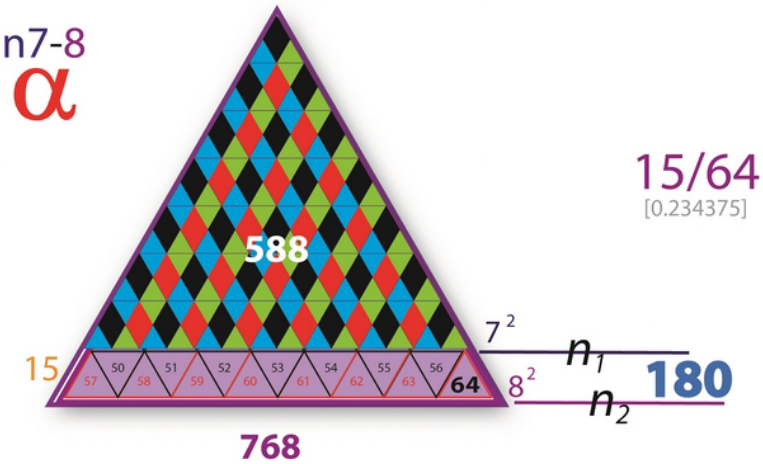
.0047

$$Mv^2 = KEM = hcR_H$$

13.525 eV

Un-named Series

n7-8
α



15/64
[0.234375]

6.2419 kj/mol

λ	19,174.54158	nm
ν̃	52,152.48541	m-1
f	1.563492179 x 10 13	Hz
E	0.064693658	eV
A	5,748.382952	m²/s

n7 KEM 12x49

588 KEM Mv²

7² 588
α 768
n

Total Quanta

n8⁺ Free electron
Total KEM in excess of 13.525eV results in unbound electron

Quanta required

Total Quanta		
768	n8	α
588	n7	
432	n6	
300	n5	
192	n4	
108	n3	
48	n2	
12	n1	

180

Un-named Spectral Line Quantum Level

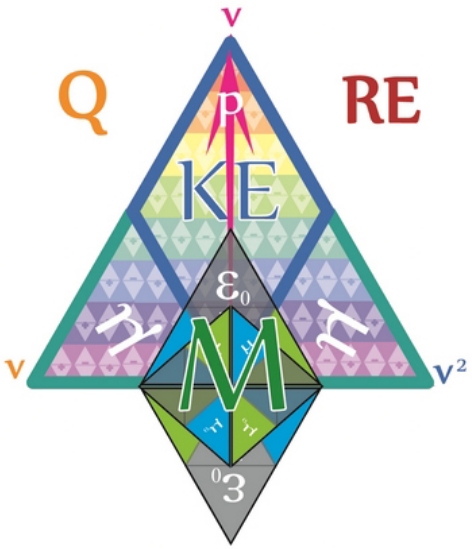
588

λ	4,494.033183	nm
ν̃	222,517.2711	m-1
f	6.67089964 x 10 13	Hz
E	0.276026278	eV
A	1,347.277254	m²/s

1,815,155

26.63248885 kj/mol

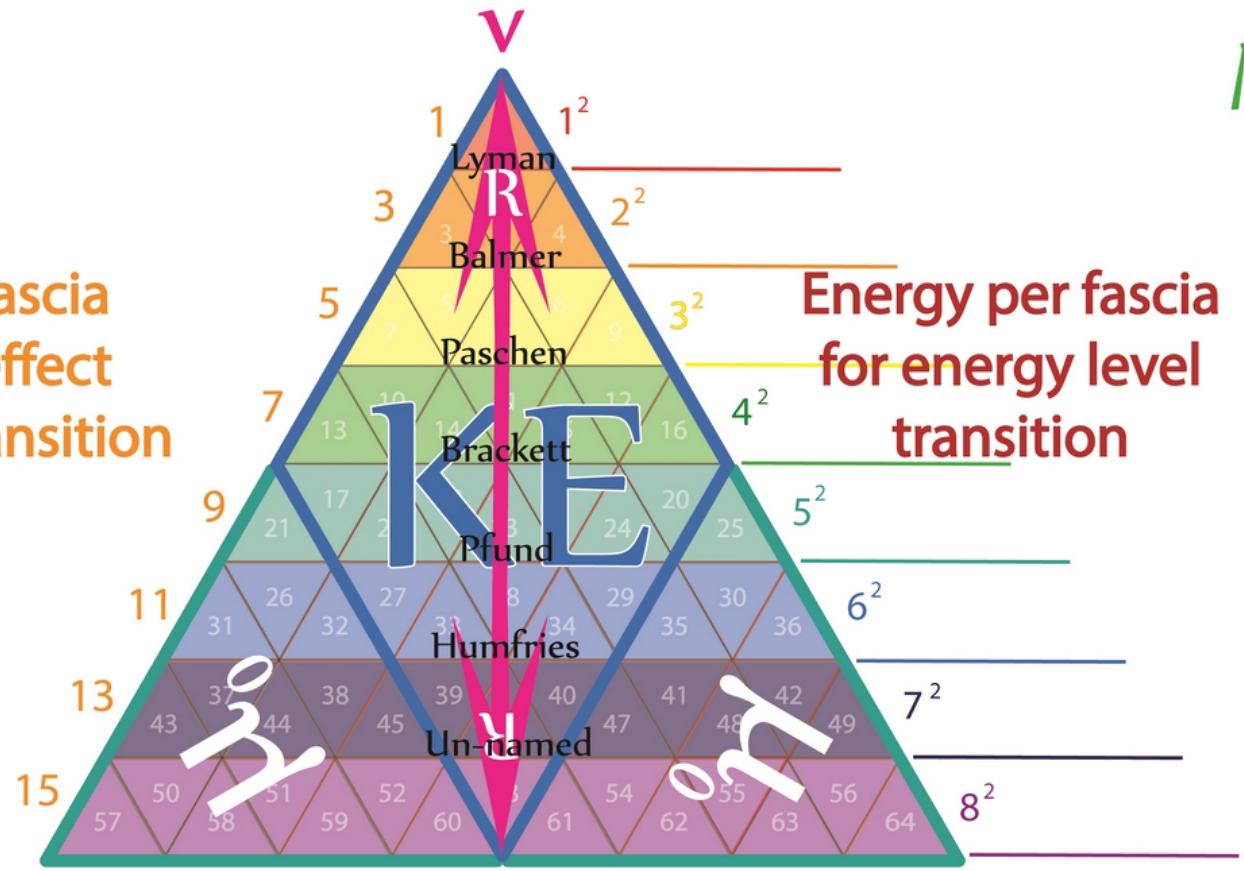
Spectral line geometry



velocity of electron resulting from energy level transition

Bosons per fascia required to effect energy level transition

Energy per fascia for energy level transition



Mv^2

12x1
12x4
12x9
12x16
12x25
12x36
12x49
12x64

All of the quantum jumps of electrons bound in a Hydrogen atom can be summerised in the Tetryonic geometry reflecting the energy levels

Ryberg's formula is a mathematical description of Tetryonic energy geometry

Ryberg's constant reflects the linear momenta of a transitioning electron

$$Mv^2 = KEM = hcR_H$$

KEM field geometry

Photoelectric energy levels

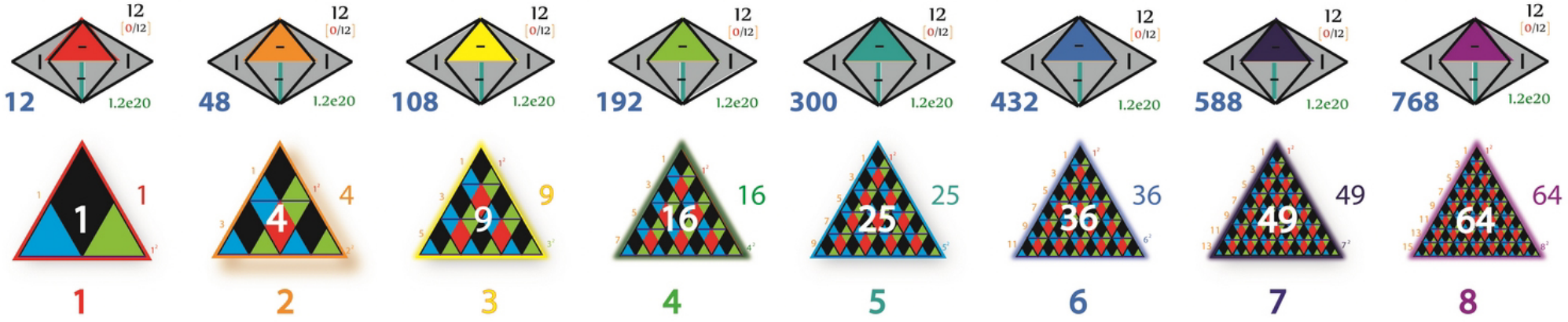
Energy resulting from the Kinetic Energy of motion is retained in c^2 KEM fields extending from the rest matter geometry of the Electron

$$Mv^2 = KEM = hcR_H$$

This forms the Quantum field basis for the Photoelectric effect

Lyman	Balmer	Paschen	Brackett	Pfund	Humphries	Un-named
91.29	367.06	833.16	1499.69	2381.53	3499.27	4880.38
91.3	367.23	834.34	1503.5	2391.17	3520.12	
91.32	367.28	835.68	1507.87	2402.25		
91.33	367.54	837.23	1512.92			
91.36	368.19	839.02				
91.38	368.59					
91.41						
UV spectrum	Visible Spectrum	IR spectrum				

Any extra Kinetic Energy applied to Leptons with this Energy level results in unbound leptons

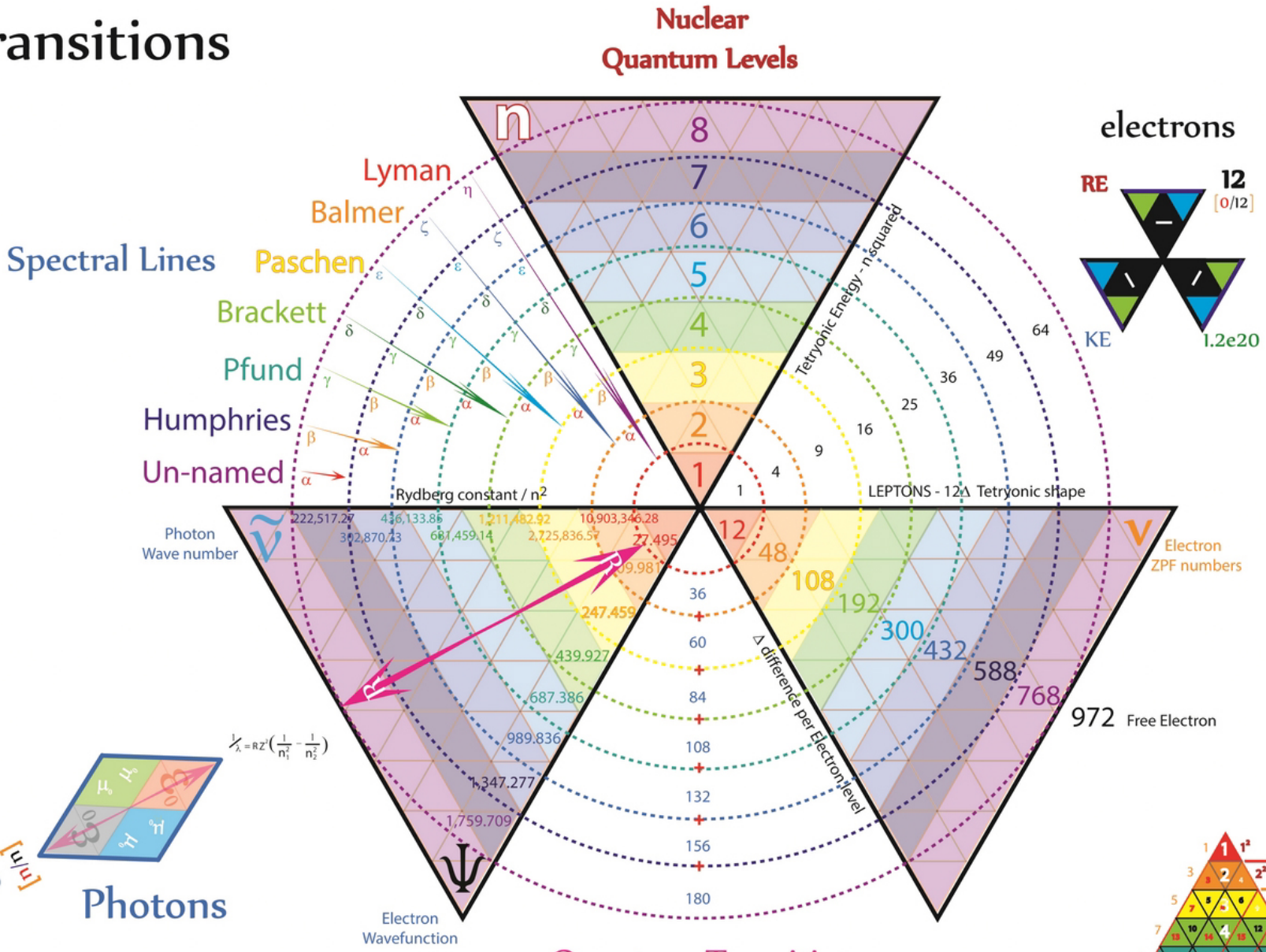


$$\text{Wavelength} = \frac{1}{(\text{Rydberg} * (\text{quantum energy differential})) * n2}$$

Rydberg constant = 10,903,346.28 m-1

1 4 9 16 25 36 49 64

Photoelectron transitions



Photon Wavelengths

Lyman Series		
α	n2-1	91.29
β	n3-1	91.3
γ	n4-1	91.32
δ	n5-1	91.33
ε	n6-1	91.36
ϕ	n7-1	91.38
η	n8-1	91.41
		UV spectrum
Balmer Series		
α	n3-2	367.06
β	n4-2	367.23
γ	n5-2	367.28
δ	n6-2	367.54
ε	n7-2	368.19
ϕ	n8-2	368.59
		Visible Spectrum
Paschen Series		
α	n4-3	833.16
β	n5-3	834.34
γ	n6-3	835.68
δ	n7-3	837.23
ε	n8-3	839.02
		IR spectrum
Brackett Series		
α	n5-4	1499.69
β	n6-4	1503.5
γ	n7-4	1507.87
δ	n8-4	1512.92
Pfund Series		
α	n6-5	2381.53
β	n7-5	2391.17
γ	n8-5	2402.25
Humphries Series		
α	n7-6	3499.27
β	n8-6	3520.12
Un-named Series		
α	n8-7	4880.38

n	V
1	12
4	48
9	108
16	192
25	300
36	432
49	588
64	768

Quantum Transition

The energy and wavelength of emitted photons
is a function of the electron's wavenumber
(which in turn is reflective of the linear momentum of the KEM field)

27.49545

Photoelectric effect

$p^2 = KEM = Mv^2$

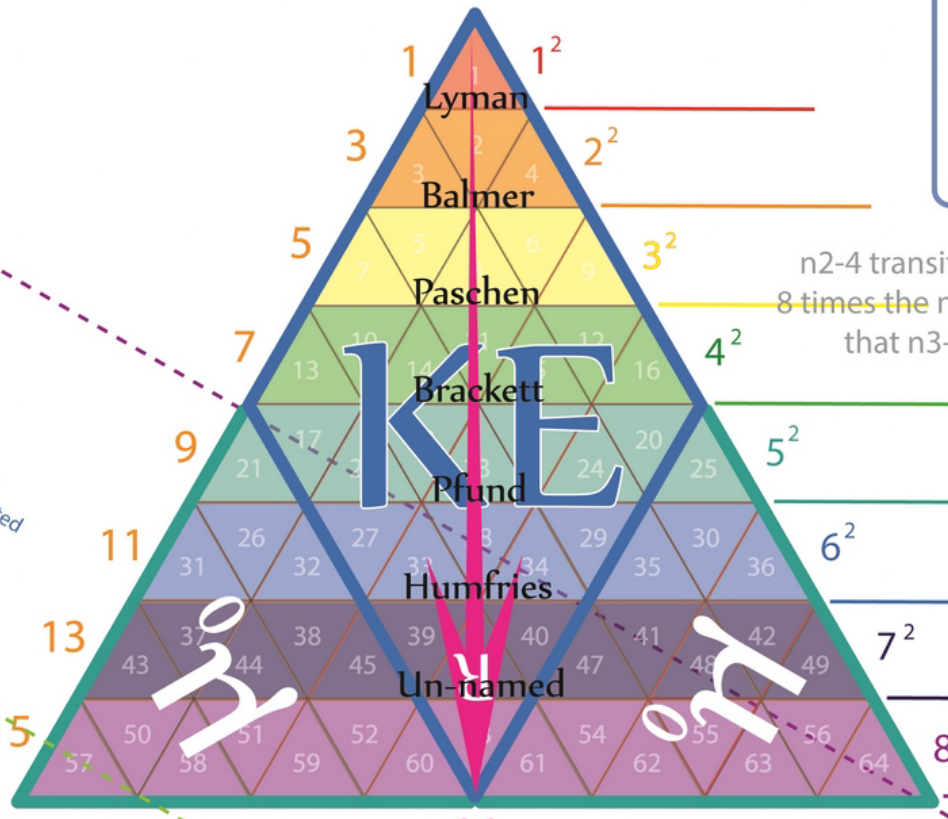
The energies of the emitted electrons are independent of the intensity of the incident radiation but are dependent on the photon frequency

$E_\gamma = hf$

Photoelectrons with higher Kinetic energy ejected

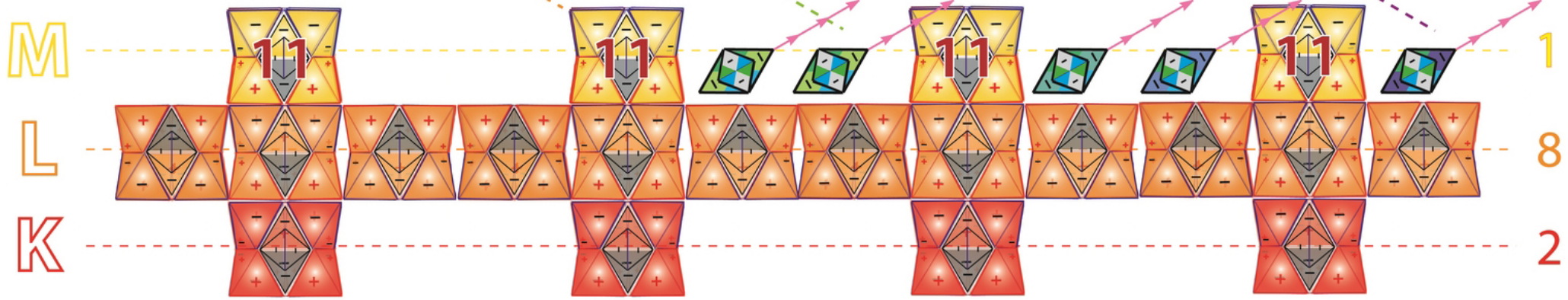
Minimal energy Photoelectrons ejected

No Photoelectrons ejected



n2-4 transitions can produce 8 times the number of electrons that n3-4 can produce

Any photon with energy in excess of these specific frequency/energies produces 'free' electrons with higher Kinetic energies

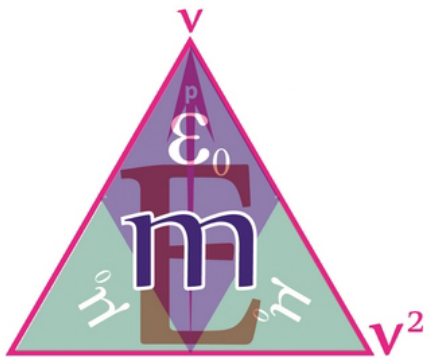


Sodium Metal Surface

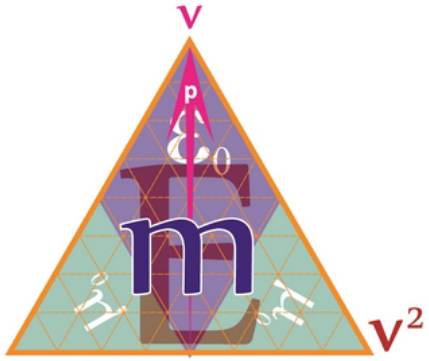
Photonic mass-Energy equivalence

All 2D EM waveforms possess mass, momentum and Energy

$$2hv^2 = E = hf$$



EM mass

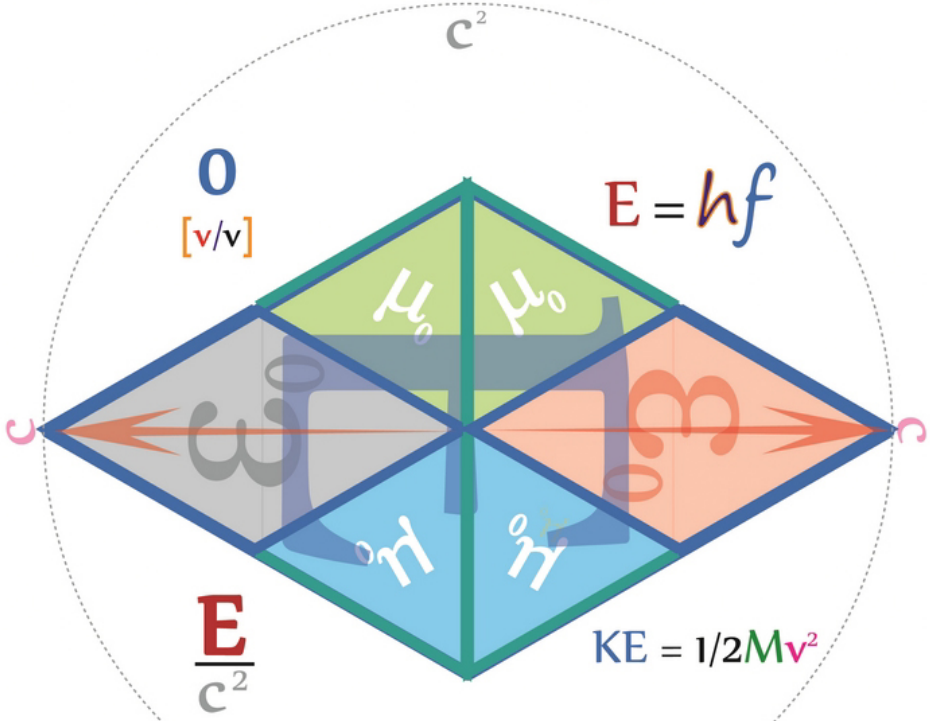


Planck Energies

Scalar mass-
Energy-momentum

$$E = mv^2$$

Standing wave
mass-Energy-momenta



Quantised Angular
Energy-momenta

$$E = hv^2$$

Non-standing wave
mass-Energy-momenta

Matter

Photons

Velocity of Light

$$v = \left[\left[\frac{c^2}{A}\right]_f \cdot \left[\frac{A}{c}\right]_\lambda\right] \qquad c_0 = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$$

Frequency Wavelength

All 2D EM waveforms propagate electrically at the speed of light

Photo-electrons

In the photoelectric effect, electrons are emitted from matter (metals and non-metallic solids, liquids or gases) as a consequence of their absorption of energy from electromagnetic radiation of very short wavelength, such as visible or ultraviolet radiation.

Photo-electrons have invariant Charge geometries

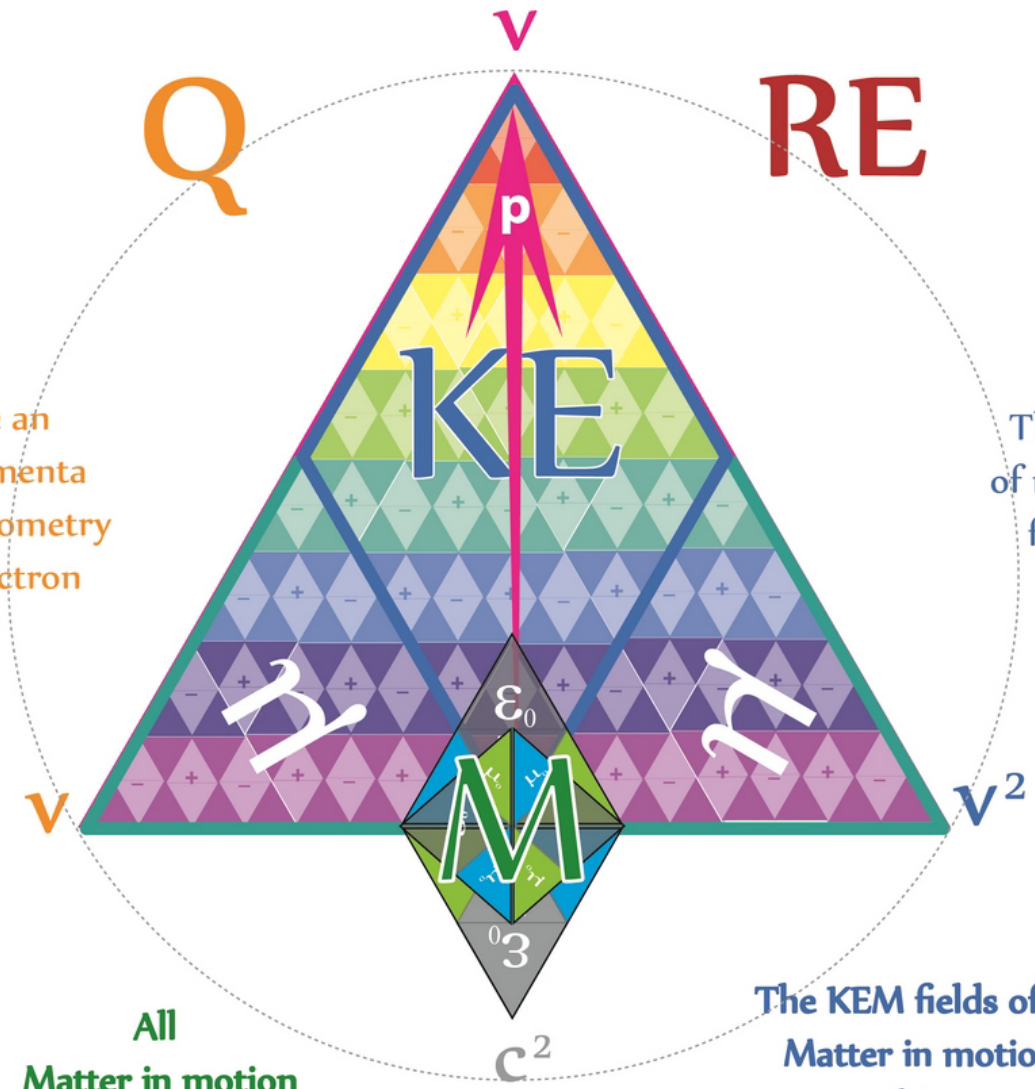
$$E = nhv$$

Each photon must provide an exact number of Energy momenta quanta to create the Energy geometry required to transition the electron

The total EM mass-Energies of a photo-electron are the sum of its Matter & relativistic KEM field

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

The varying quantum level energies of neutral KEM fields follow Rydberg's formula and produce the familiar Spectral lines



Absorption lines

Emission lines

All Matter in motion is lorentz invariant

The KEM fields of all Matter in motion is subject to Lorentz corrections

Waves or Particles

The photoelectric effect was first observed in 1887 by Heinrich Hertz (1857-1894)
during experiments with a spark-gap generator — the earliest form of radio receiver

Confusing quanta [v] with frequency [f] is the source of considerable quantum confusion

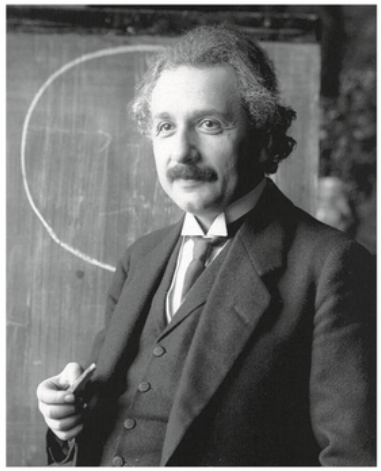
In order to explain the frequency distribution of radiation from a hot cavity (blackbody radiation). I propose the ad hoc assumption that the radiant energy could exist only in discrete quanta which were proportional to the frequency.

$$E = nhv$$

Photons

It seems to me that the observation associated with black body radiation, fluorescence, the photoelectric effect, and other related phenomena associated with the emission or transformation of light are more readily understood if one assumes that the energy of light is discontinuously distributed in space.

In accordance with the assumption to be considered here, the energy of a light ray spreading out from a point is not continuously distributed over an increasing space, but consists of a finite number of energy quanta which are localized at points in space, which move without dividing, and which can only be produced and absorbed as complete units.



$$2v = f$$

Later experiments by others, most notably Robert Millikan (1865-1953), found that light with frequencies below a certain cutoff value, called the threshold frequency, would not eject photoelectrons from the metal surface no matter how bright the source

$$E = hf$$

So the question was born: is light a Wave, or a Particle?

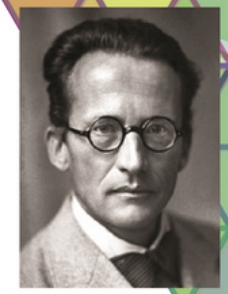
The quantum idea was soon seized upon to explain the photoelectric effect, and became part of the Bohr theory of discrete atomic spectra, quickly becoming part of the foundation of modern quantum theory in turn this led to the quantum wierdness of wave-particle dualty, Heisenberg's Uncertainty principle and Schrodinger's quantum wave equation & wavefunctions.

Wave Particle Mechanics

$E = h\nu$ $E = hf$

Planck-Einstein

de Broglie



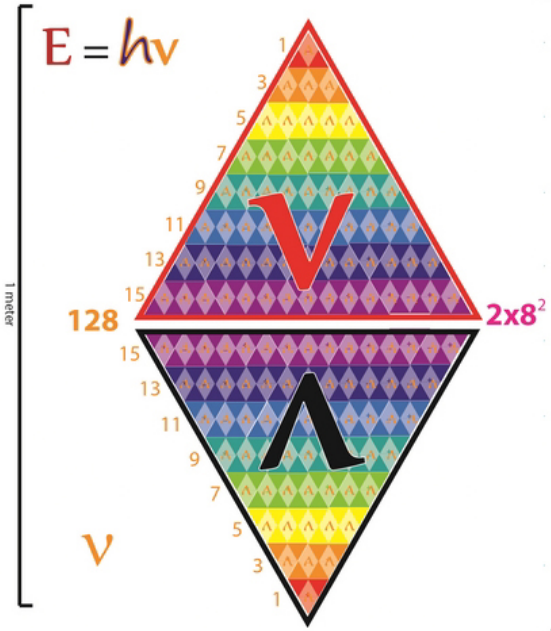
Schrodinger

Heisenberg

$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$ Bosons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Transverse Boson quanta

$E = h\nu$



Wavenumber

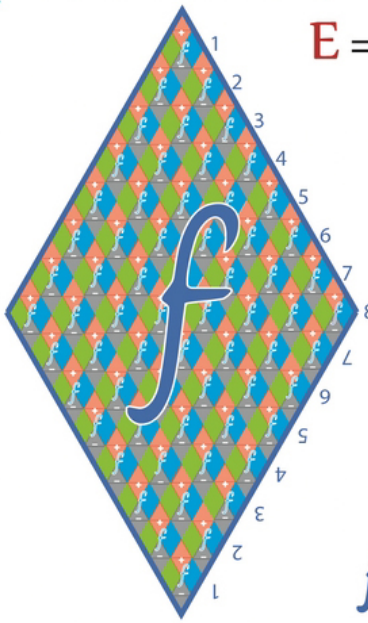
Wavelength

Wave Probability

$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$ Photons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Longitudinal Photon Frequency

$E = hf$

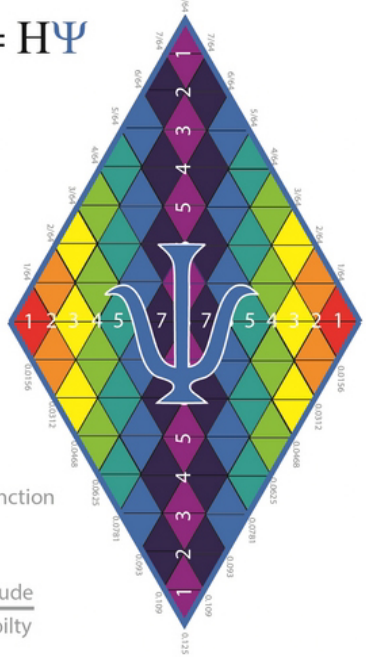


Group Phase Velocity

$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$ EM waves · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

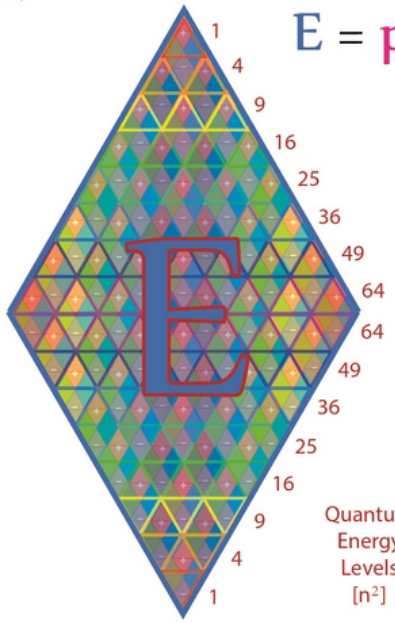
EM waveform

$E\Psi = H\Psi$



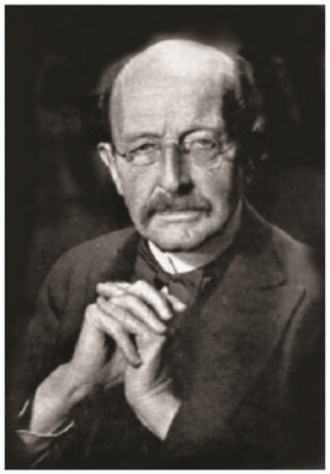
Amplitude

$E = p^2$



Blackbody Radiation

Max Planck

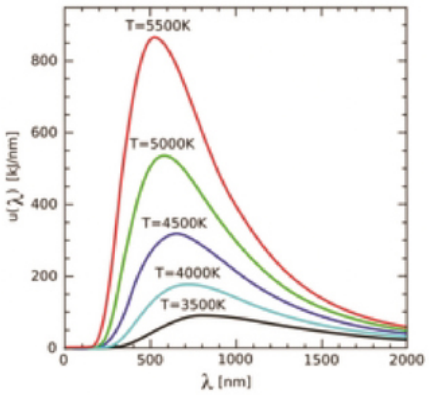


(April 23, 1858 – October 4, 1947)

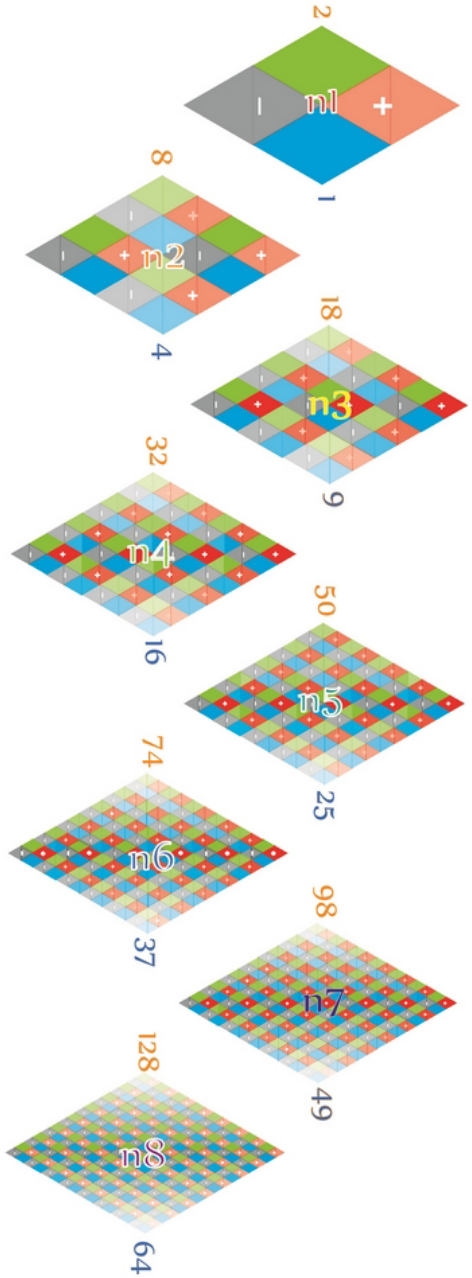
In physics, Planck's law describes the amount of electromagnetic energy with a certain wavelength radiated by a black body in thermal equilibrium (i.e. the spectral radiance of a black body).

The law is named after Max Planck, who originally proposed it in 1900. The law was the first to accurately describe black body radiation, and resolved the ultraviolet catastrophe by introducing Planck's Constant.

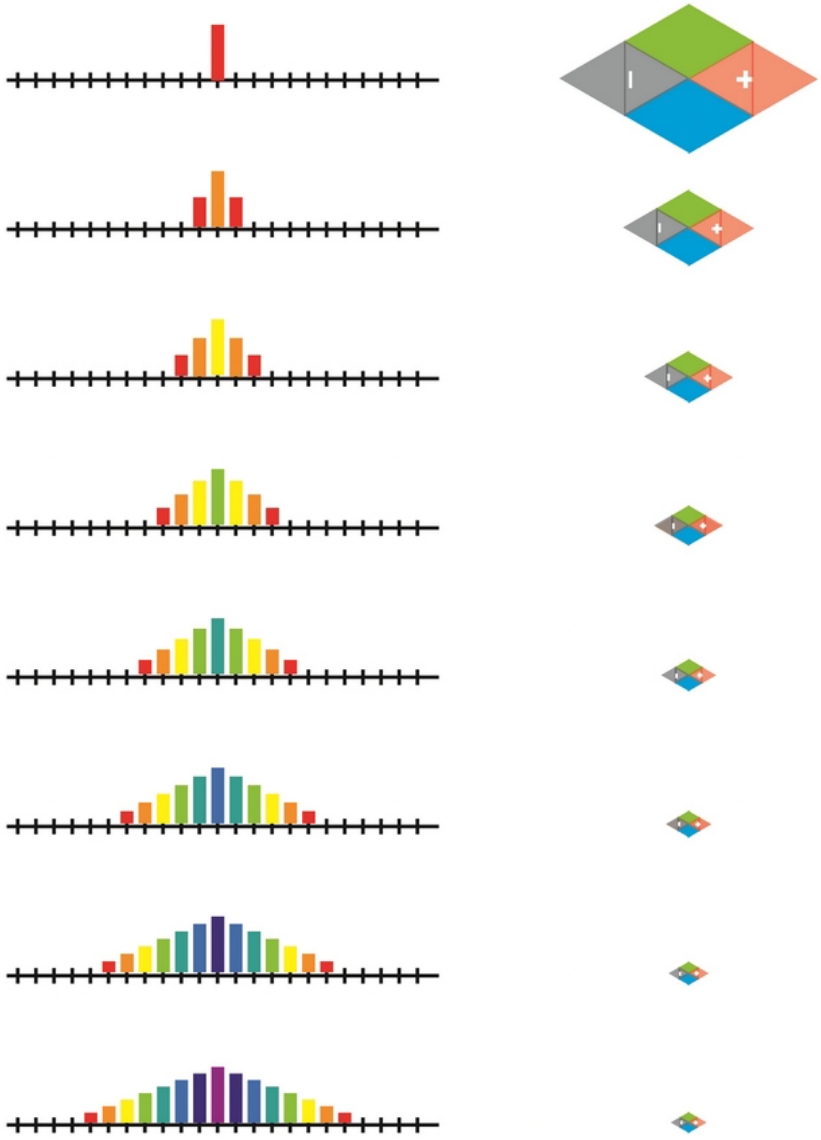
It is a pioneer result of modern physics and quantum theory.



$h = 6.62943244\ e\text{-}34\ J.s = mA$



As the Compton Frequency increases the de Broglie wavelength of Photons within any measured EM wave decreases



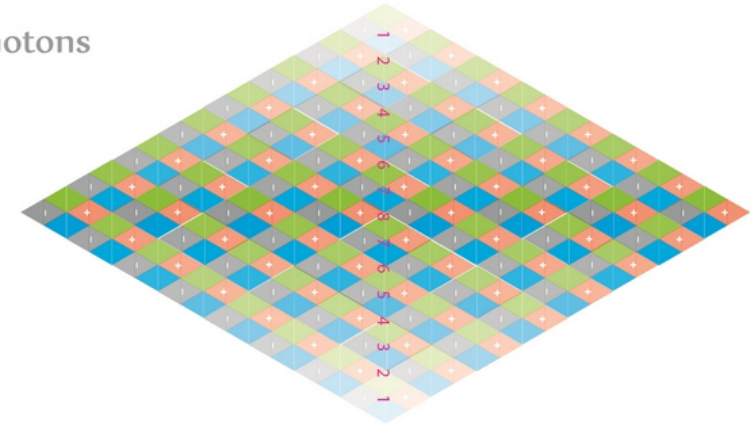
$$2h\nu = \frac{hc}{\lambda} = hf$$

Probabilistic Energy distributions

form the basis for Quantum mechanical probabilities and Wavefunctions

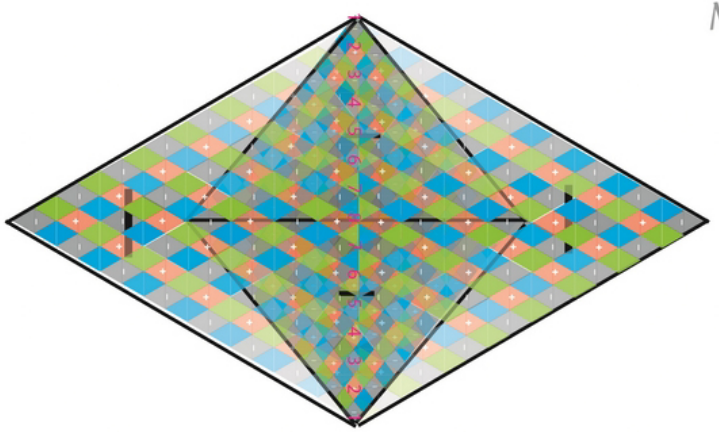
$E = 2mv$

Photons

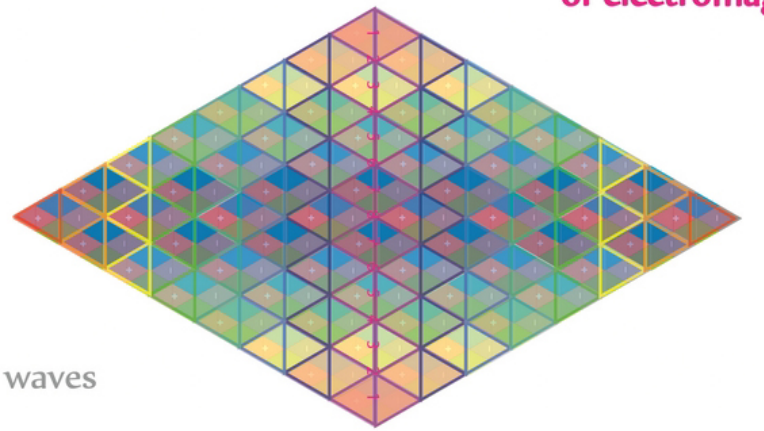


$E = Mc^4$

Matter



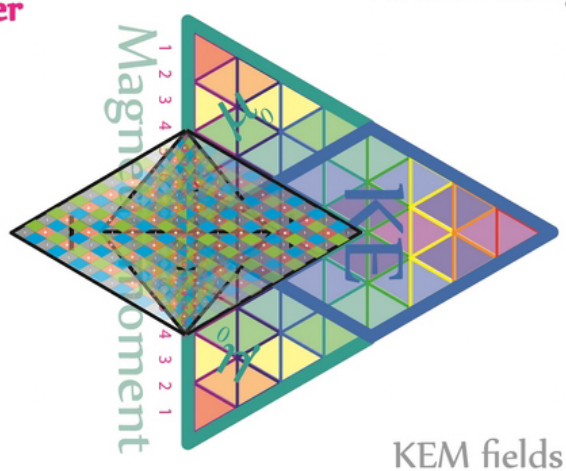
All ENERGY in Motion has probabilistic distribtutions of Energy quanta resulting from the equilateral Tetryonic geometries of electromagnetic mass-ENERGY-Matter



EM waves

$p^2 = E = mv^2$

Kinetic Energies



$KE = \frac{1}{2}Mv^2$

KEM fields

$Mv^2 = KEM$

EM wave properties

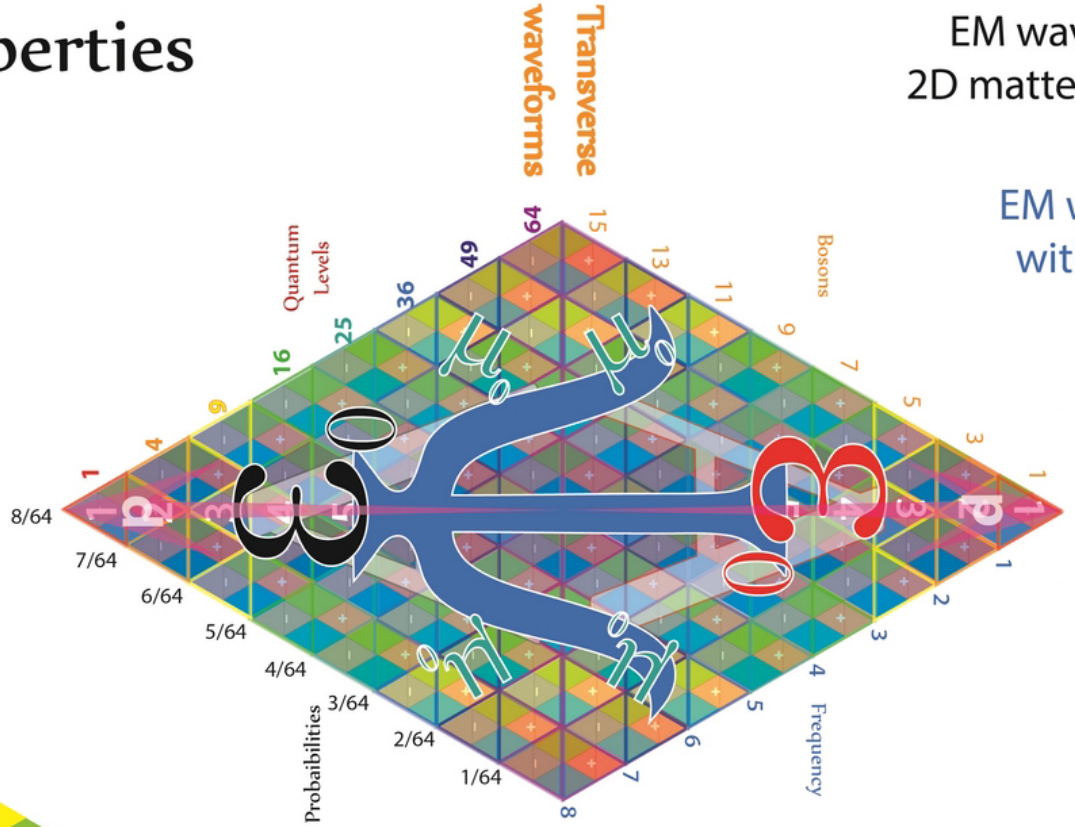
EM waves are even geometry
2D matter-less energy geometries

Linear momentum
is the square root
of scalar Energy

$$\left[\sqrt{[mAv^2]}\right]$$

Energy

mass quanta



EM waves are comprised of Photons
with Kinetic Enegy, momenta and
have a magnetic moment

$$p_\gamma = 2\pi[[mAv]]$$

Energy

momenta

Photonic energy-momentum

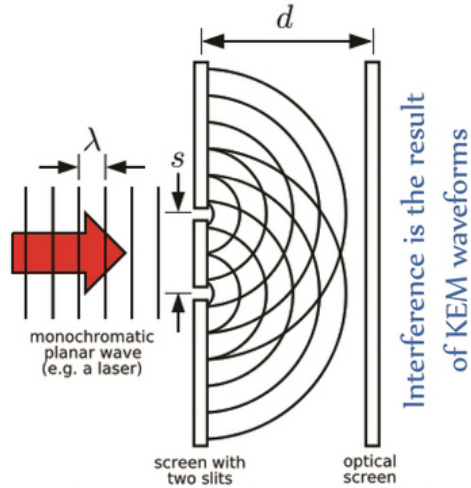
Longitudinal waveforms

EM waveform geometries

A

Quantised Angular Momenta
is the scalar source of all
Linear Momentum

p



Interference is the result
of KEM waveforms

Conservation of Momentum

Momentum is a conserved quantity (law of conservation of linear momentum),
meaning that if a closed system is not affected by external forces, its total momentum cannot change

EM waves, Photons and Matter
all exhibit
Wave and Particle behaviours

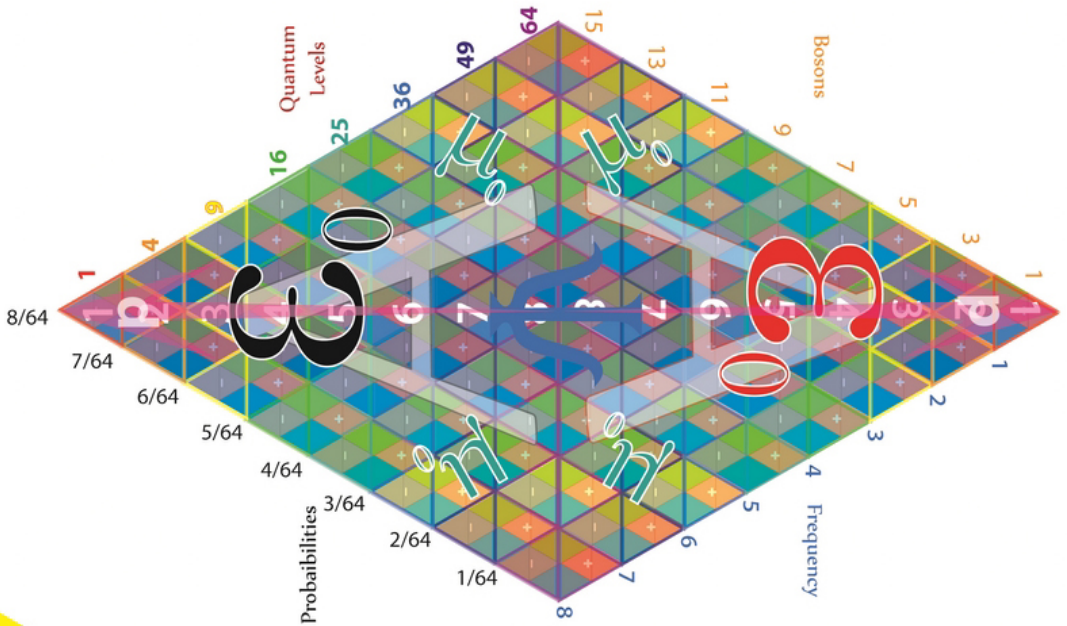
Wave-Particle Duality

Particle

$$\left[\sqrt{[mAv^2]}\right]$$

Energy

mass quanta



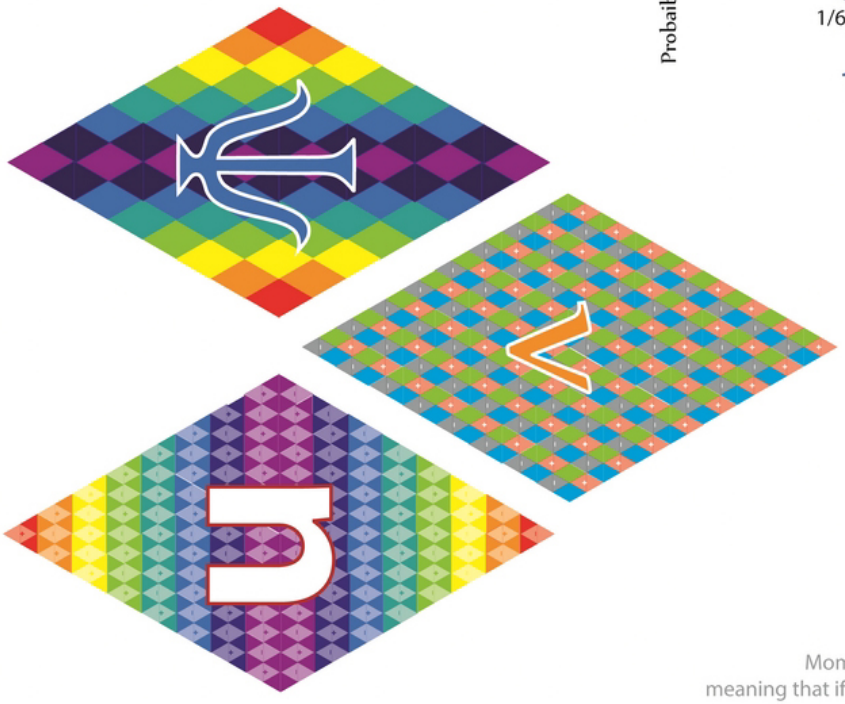
Wave

$$p_\gamma = 2\pi[[mAv]]$$

Energy

momenta

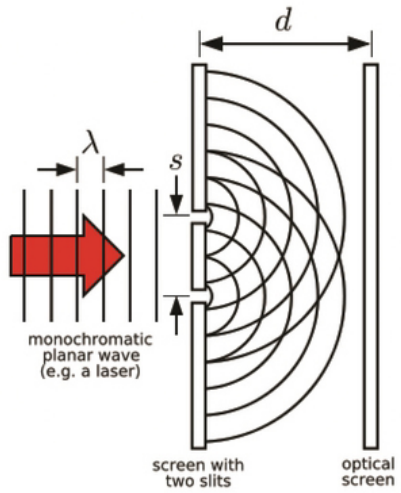
Photonic energy-momentum



A

Quantised Angular Momenta
are the squared scalar source
of all Linear Momentum

p

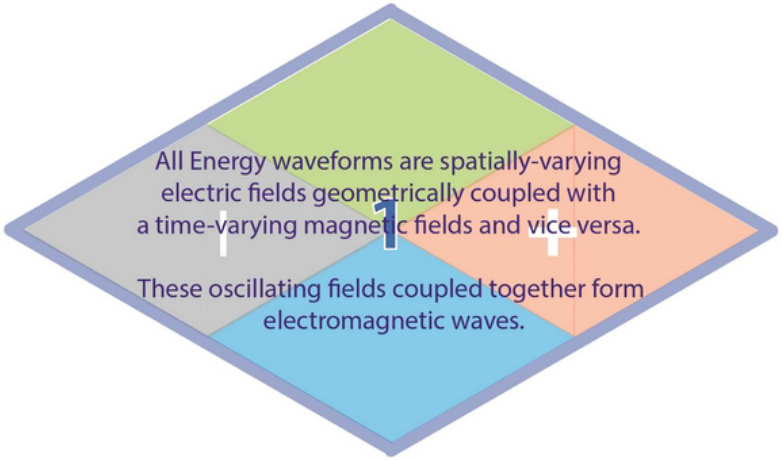


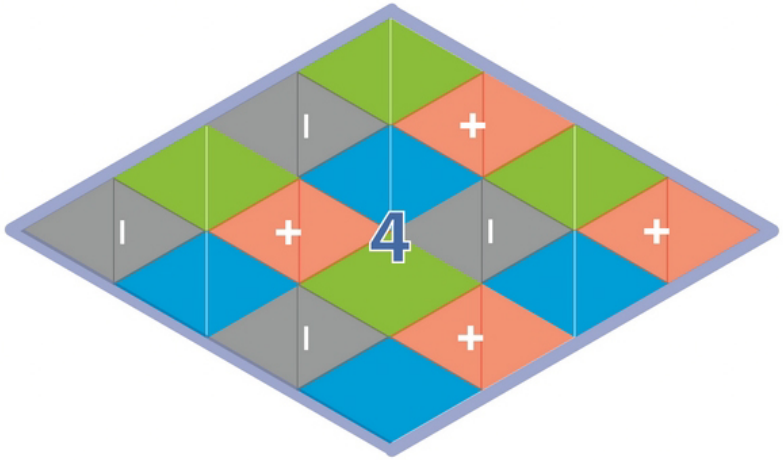
Conservation of Momentum

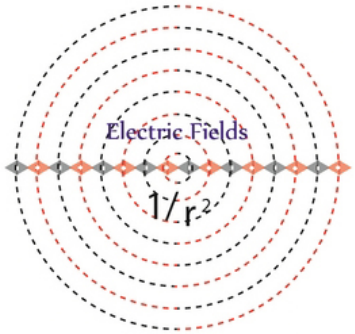
Momentum is a conserved quantity (law of conservation of linear momentum),
meaning that if a closed system is not affected by external forces, its total momentum cannot change

EM fields

$$E = n\pi\left[\left[mAv^2\right]\right]$$ (Planck quanta; mass; velocity)

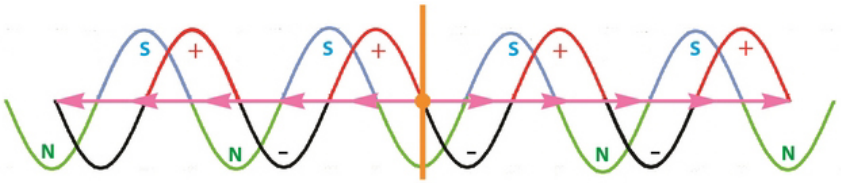






$$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (Charge; EM Field; ElectroMagnetic; mass; velocity; Planck quanta)

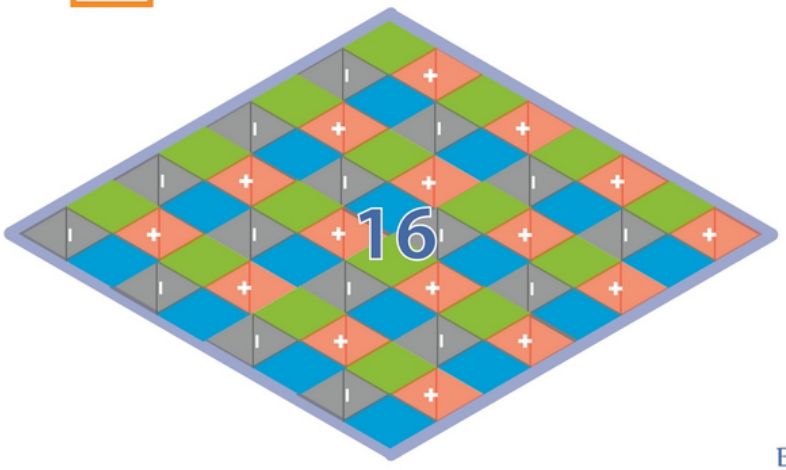
$$E = h\nu$$



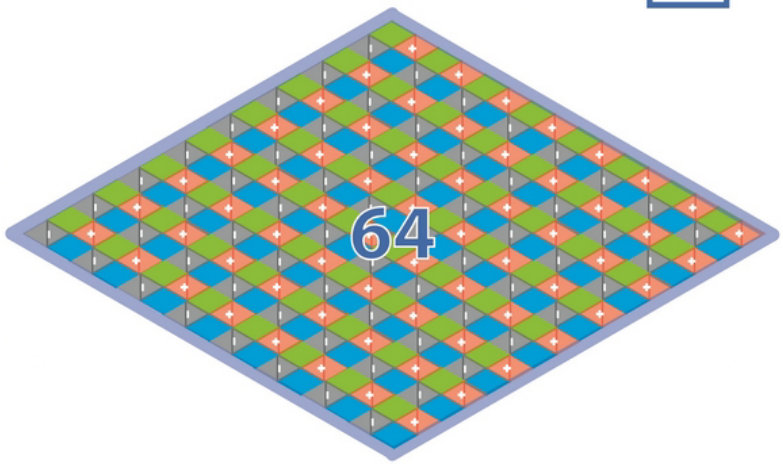
EM waves are a Quadrature waveform of Electric and Magnetic oscillations

$$E = hf$$

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (Photons; EM Field; ElectroMagnetic; mass; velocity; Planck quanta)



$$\text{EVEN}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (EM Field; Planck quanta; EM waves; ElectroMagnetic; mass; velocity)

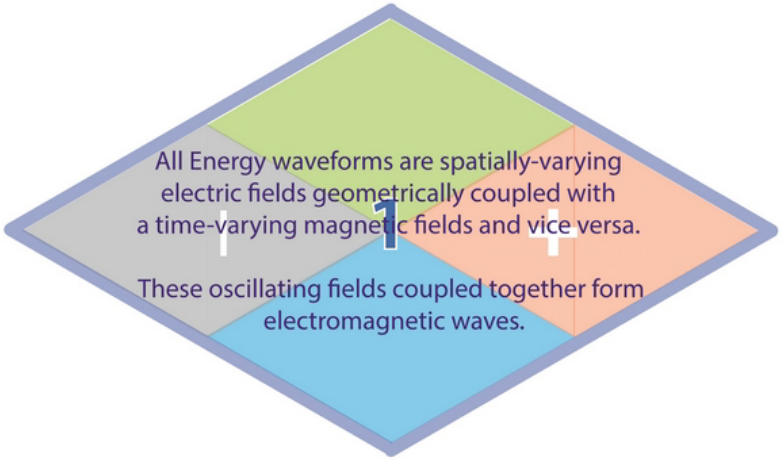


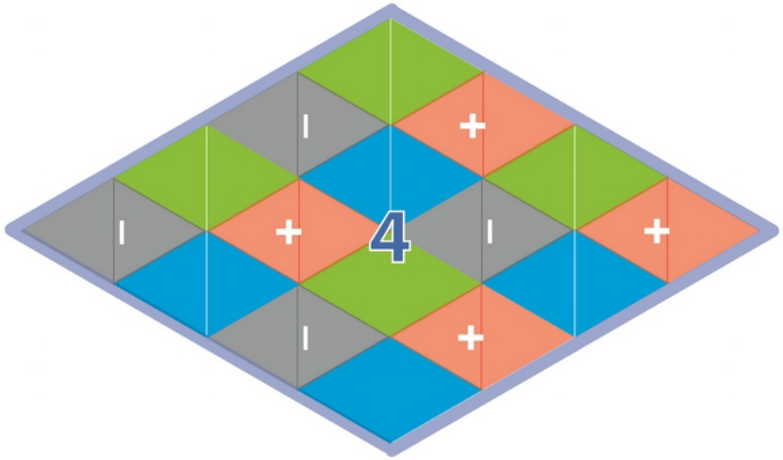
EM fields

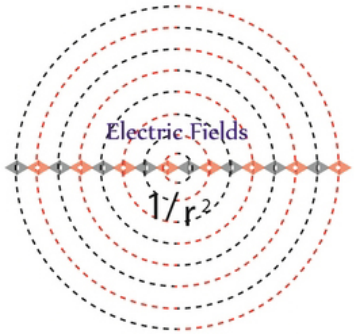
$$E = T\pi\left[\left[mAv^2\right]\right]$$ (Planck quanta; mass; velocity)

All Energy waveforms are spatially-varying electric fields geometrically coupled with a time-varying magnetic fields and vice versa.

These oscillating fields coupled together form electromagnetic waves.







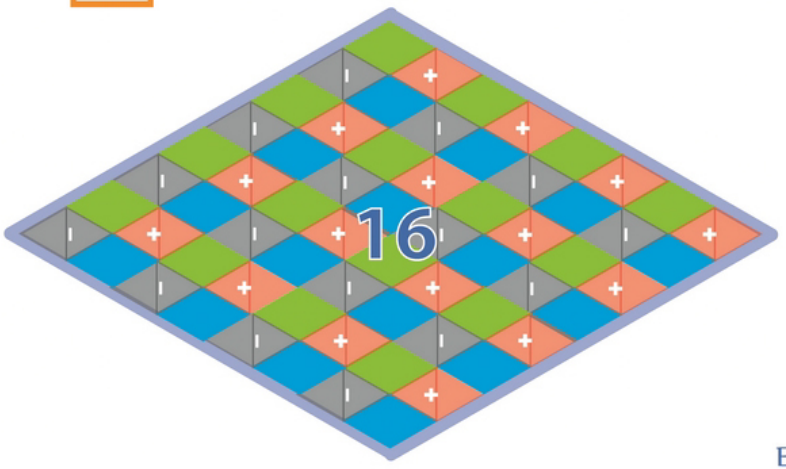
$$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (Charge; EM Field; ElectroMagnetic; mass; Planck quanta; velocity)

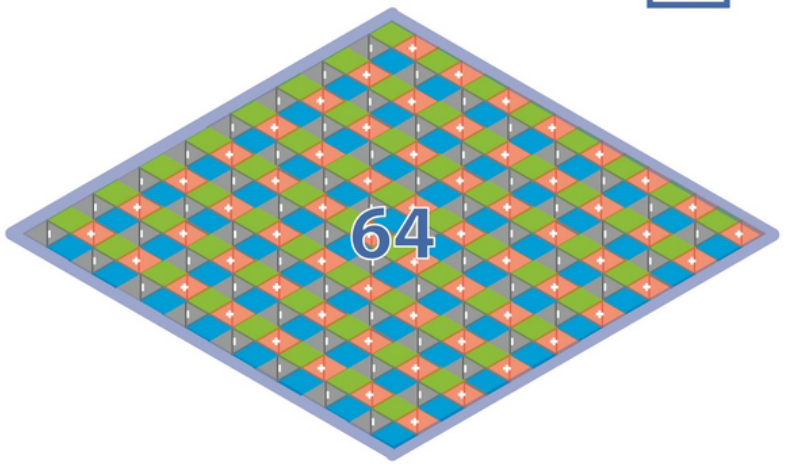
$$E = h\nu$$

EM waves are a Quadrature waveform of Electric and Magnetic oscillations

$$E = hf$$

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (Photons; EM Field; ElectroMagnetic; mass; Planck quanta; velocity)





$$\text{EVEN}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$ (EM Field; Planck quanta; EVEN EM waves; ElectroMagnetic; mass; velocity)

Transverse

Bosons

$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$

Boson Frequency (ν)

$\nu = 128$

$E = h\nu$

Group Phase Velocity

(with respect to E field)

$E = hf$

64

EM wave Frequency (f)

Longitudinal

Photons

$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$

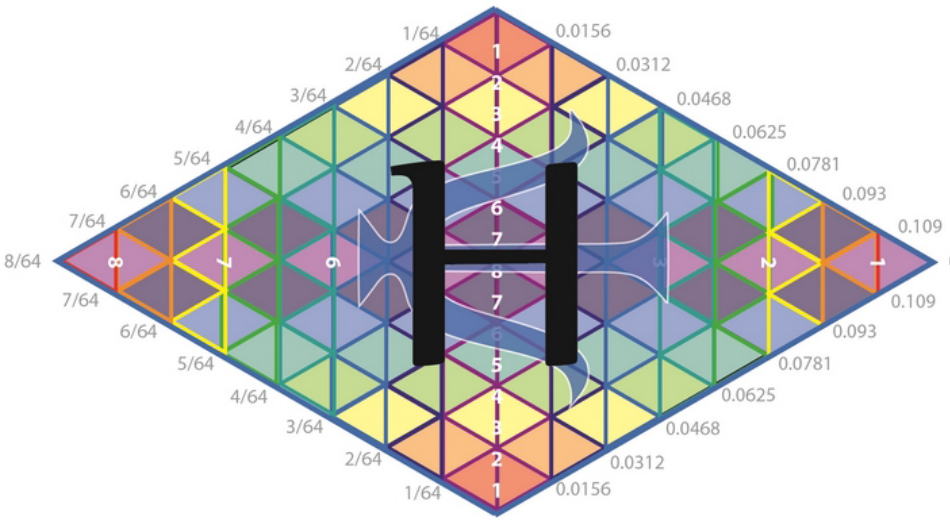
$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$

EM Field · Planck quanta

EM waves · ElectroMagnetic · mass · velocity

EM waves

$\nu = 128$



$f = 64$

Wave Probabilites

Probability

$[\text{Amplitude}]^2$

$64 = 8^2$

Hamiltonian EM waveform

EM waves

Boson Frequency (ν)

ν =128

Bosons

ODD π [[ε₀μ₀] . [mAv²]]

EM Field · Planck quanta · Bosons · ElectroMagnetic · mass · velocity

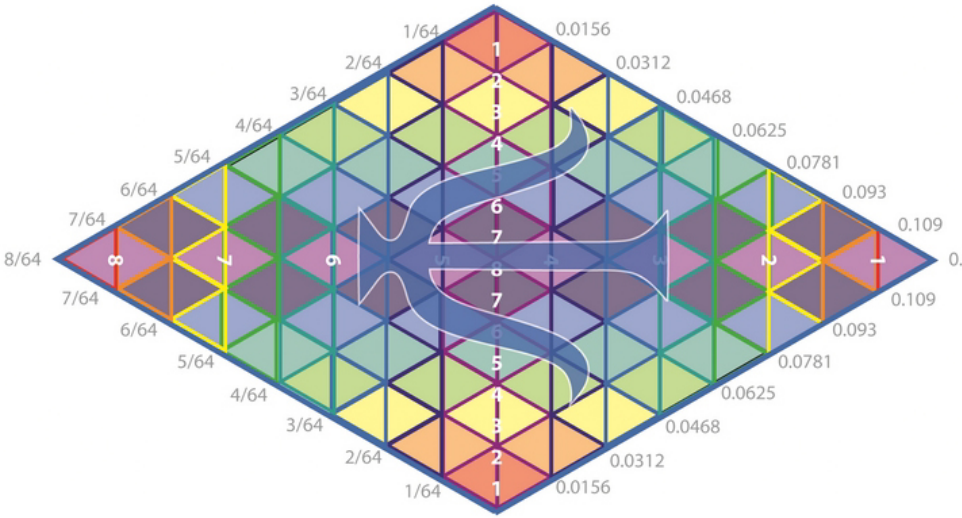
E = hν

EVEN π [[ε₀μ₀] . [mAv²]]

EM waves · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Quantum levels

ν =128



Particle~Wave

Group Phase Velocity

(with respect to E field)

c p p c

E = hf

f = 64

Wave Probabilites

Photons

2π Photons [[ε₀μ₀] . [mAv²]]

EM Field · Planck quanta · Photons · ElectroMagnetic · mass · velocity

64

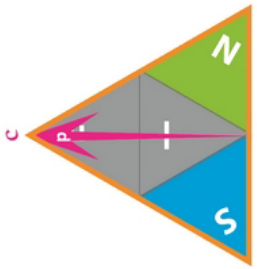
EM wave Frequency (f)

Probability

[Amplitude]^2

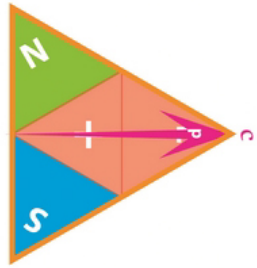
$8^2 = 64$

Bosons and Photons in EM waves



$$\text{ODD}\,\pi\,\text{Bosons}\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

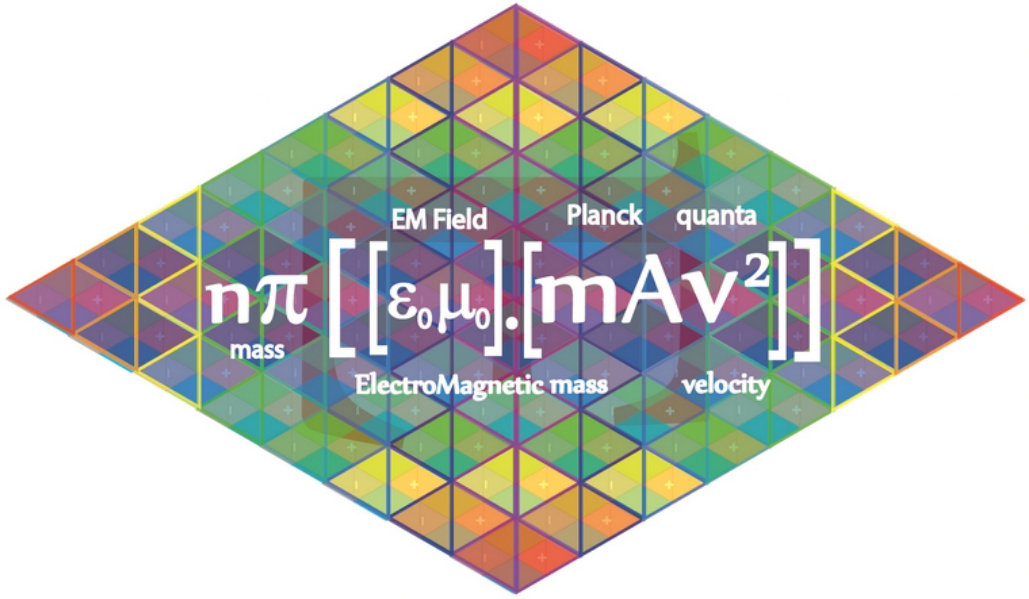
EM Field — Planck quanta — ElectroMagnetic — mass — velocity



Transverse Charge Quanta

All EM waves are comprised of transverse Bosons

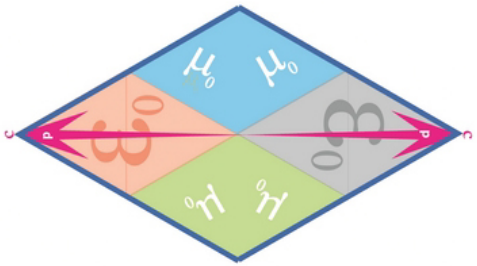
$$E = h\nu$$



$$E = hf$$

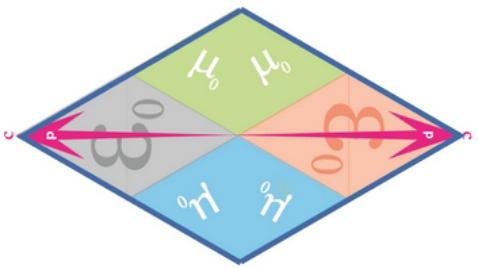
All EM waves are comprised of longitudinal Photons

Longitudinal KE Frequency

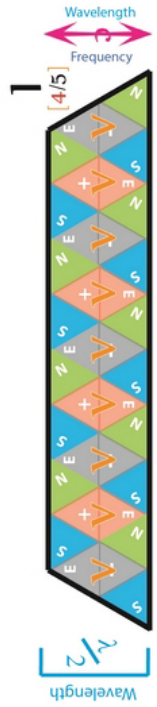


$$\text{EVEN}\,\pi\,\text{Photons}\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

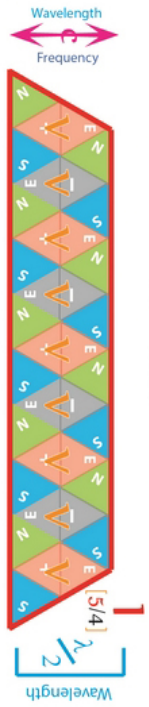
EM Field — Planck quanta — ElectroMagnetic — mass — velocity



EM wave energies



All EM waves are composed of Bosons

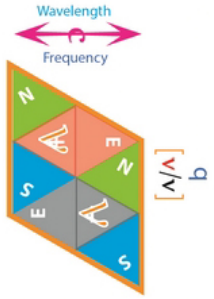


Boson

$E = n.h\nu$

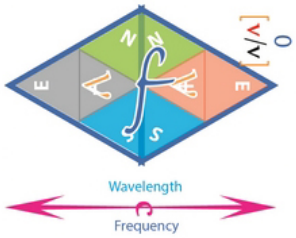
$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

Bosons — EM Field — ElectroMagnetic — mass — velocity — Planck quanta



Transverse neutralZ Boson frequency [ν]

Bosons and Photons with the same Energies have differing Tetryonic geometries



Longitudinal Photon frequency [f]

Wavefunction

Ψ

Probability = |Amplitude| ^{2}

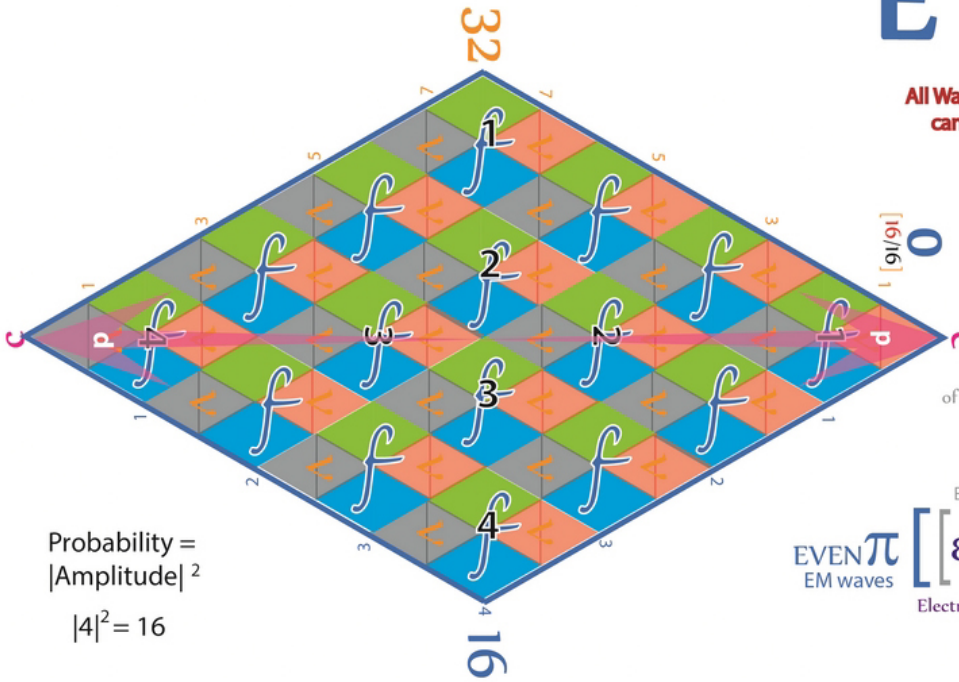
$$i\hbar\frac{\partial}{\partial t}\Psi = \hat{H}\Psi$$

Tranverse Bosons in EM wave energies should be modelled using [ν] quanta and The Longitudinal EM wave energies should be modelled using [f] Frequency

$$E = n\pi\left[mAv^2\right]$$

Planck quanta — mass — velocity

All Wave Particle geometries and Energy levels can be calculated and modelled with the Tetryonic Unified Field Equation



Probability = |Amplitude| ^{2}

$|4|^2 = 16$

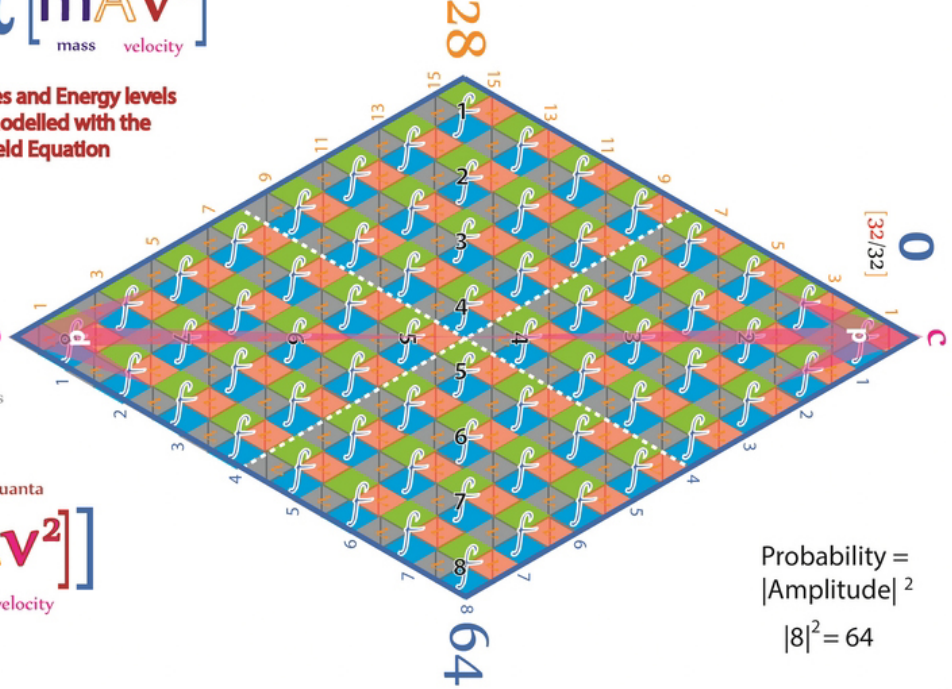
All EM waves are composed of Square number Photons

Photon

$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM waves — EM Field — ElectroMagnetic — mass — velocity — Planck quanta

$E = hf$



Probability = |Amplitude| ^{2}

$|8|^2 = 64$

Wave Particle Duality

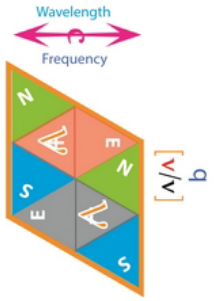
All EM waves are composed of Bosons

Boson
$E = n.h\nu$

ODD π Bosons

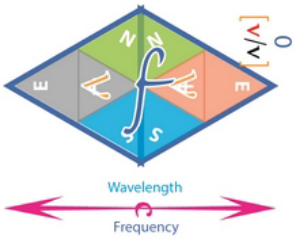
$$\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field — Planck quanta
ElectroMagnetic — mass — velocity



Transverse neutralZ Boson frequency [ν]

Bosons and Photons with the same Energies have differing Tetryonic geometries



Longitudinal Photon frequency [ƒ]

Wavefunction

Ψ

Probability = |Amplitude| ^{2}

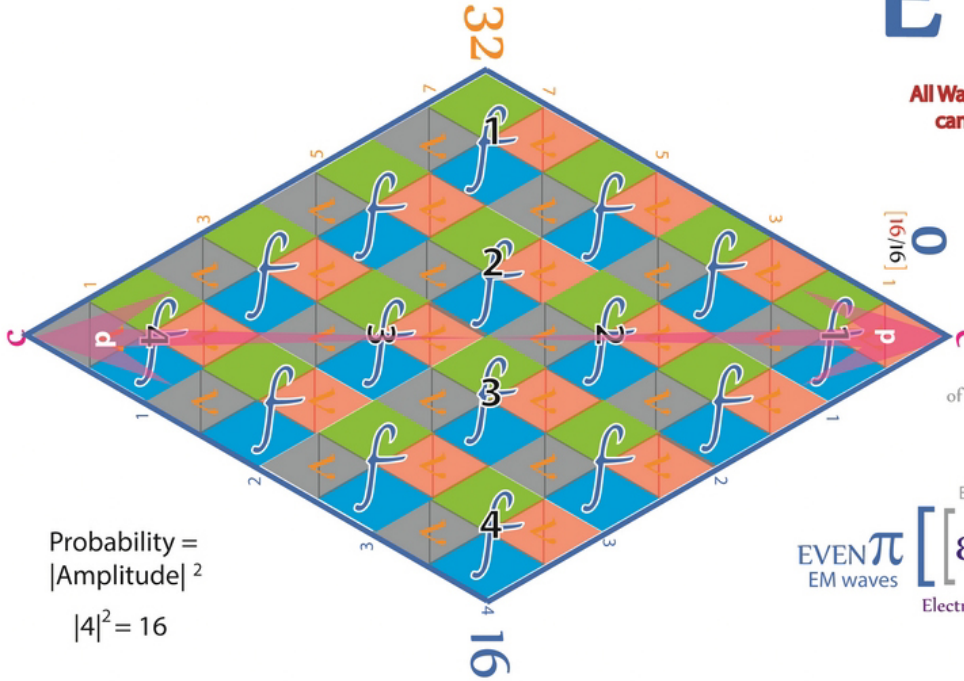
$$i\hbar\frac{\partial}{\partial t}\Psi = \hat{H}\Psi$$

The Particle nature of Light should be calculated using ν frequency and The Wave nature of Light should be calculated using ƒ Frequency

$$E = T\pi\left[mAv^2\right]$$

Planck quanta — mass — velocity

All Wave Particle geometries and Energy levels can be calculated and modelled with the Tetryonic Unified Field Equation



Probability = |Amplitude| ^{2}

$|4|^2 = 16$

All EM waves are composed of Square number Photons

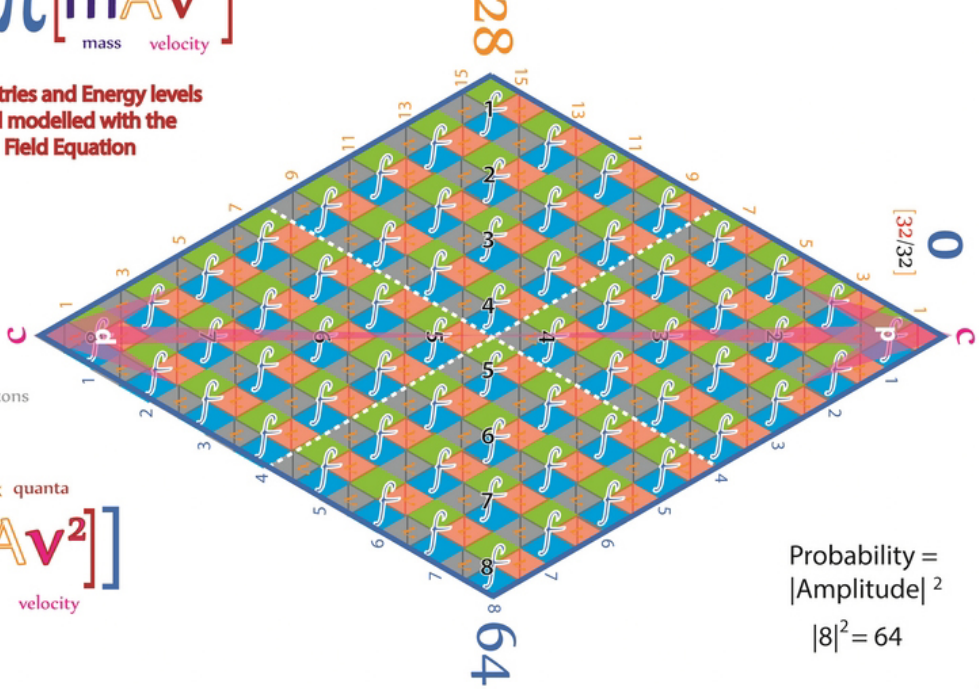
Photon

EVEN π EM waves

$$\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field — Planck quanta
ElectroMagnetic — mass — velocity

$E = hf$

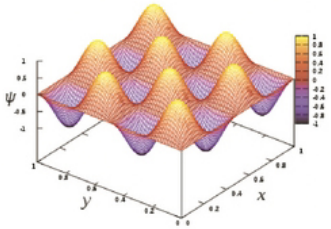


Probability = |Amplitude| ^{2}

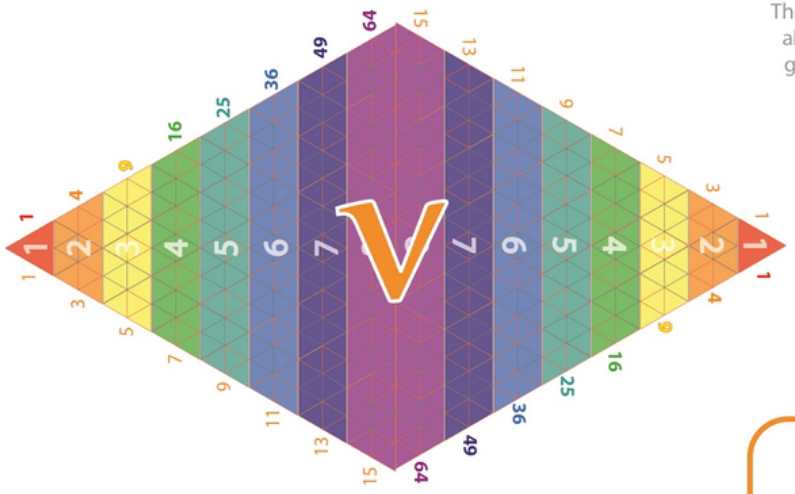
$|8|^2 = 64$

Wavefunctions

The wavefunction for a system contains all the information about the quantum state that a particle/system is in and gives a complete description of that part of the world at one particular instant.

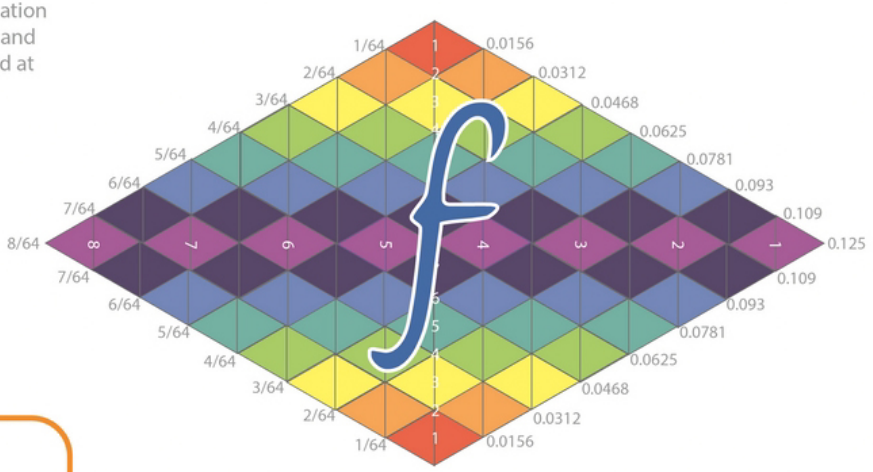


$E = h\nu$



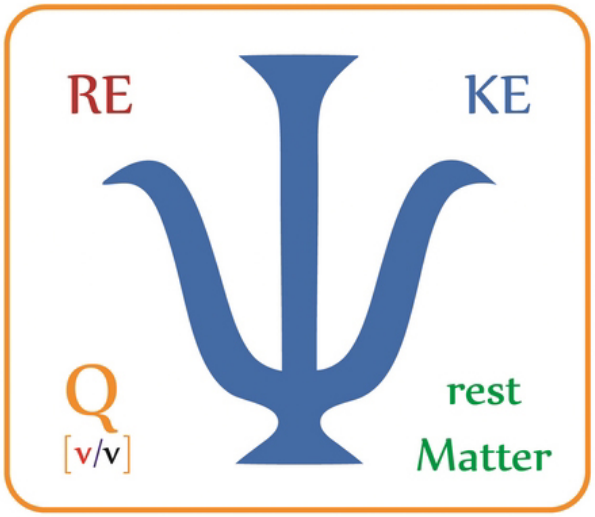
Transverse EM masses

Longitudinal EM masses

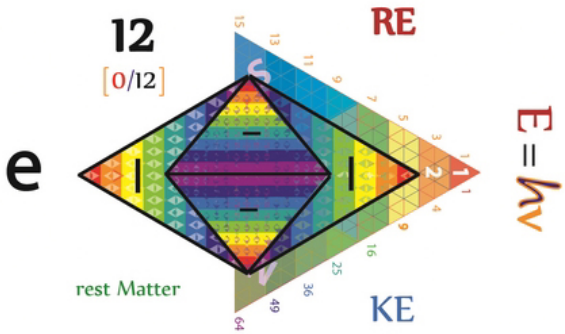


f=64

$E = hf$



The wavefunction of an EM wave (KEM) is distinct from the Wavefunction of a Particle's rest Matter but can be described using Tetryonic geometry



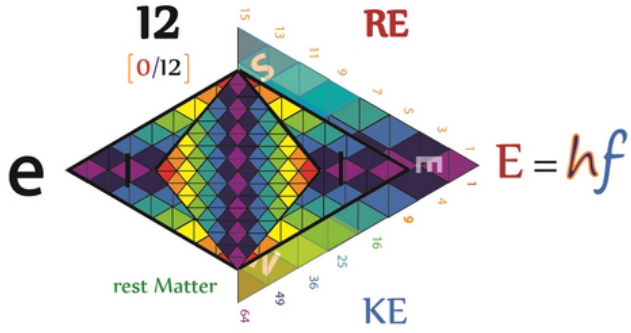
Quantum Energy Levels

The wavefunction itself is often said to be un-observable. In fact, it can modelled as it is a reflection of the quantas making up the quantum state of any particle and is complex-valued.

As the system evolves over time, the wavefunction also changes, so it can be written as a function of time Ψ(t).

$$\int_{-\infty}^{\infty} |\Psi|^2 dx = 1.$$

The absolute square of the function must be normalizable



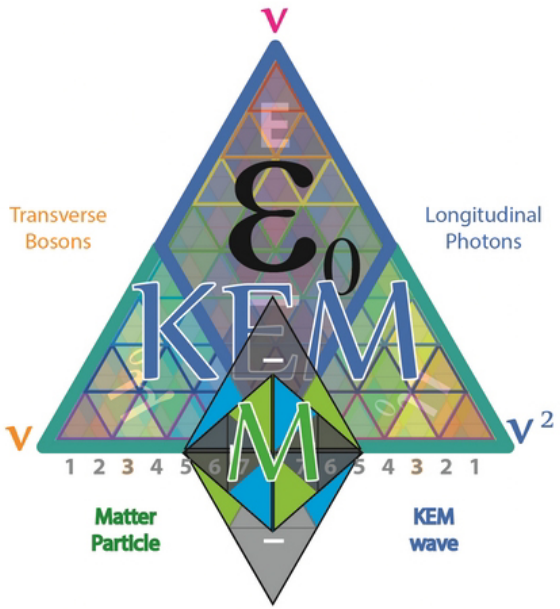
Wave-Particle Probabilities

The absolute square of the wavefunction is a probability density (the area of highest probability for a measurement to take place.

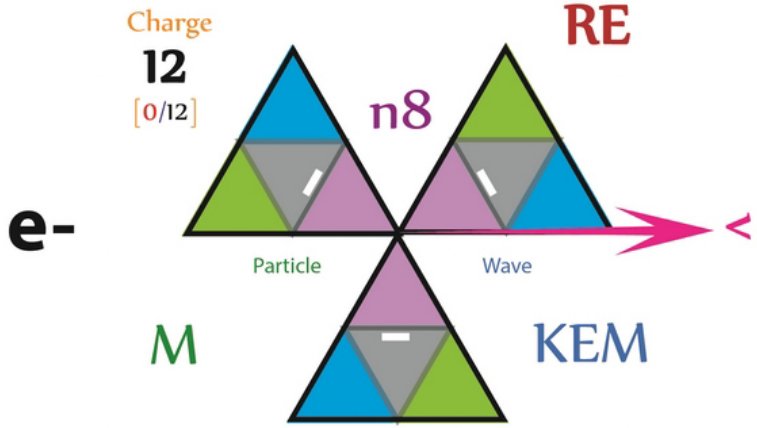
For example, if the wavefunction is expressed in real space and our system is a particle, the absolute square gives a probability density for the position of the system. Integrating this probability density between some bounds will give the probability that the particle will be found in that region when its position is measured

Wave-particle Probabilities

All Matter in motion exhibits a Wave-Particle Duality due to the waveform geometry of its KEM wave and the Particle geometry of its standing wave energyforms

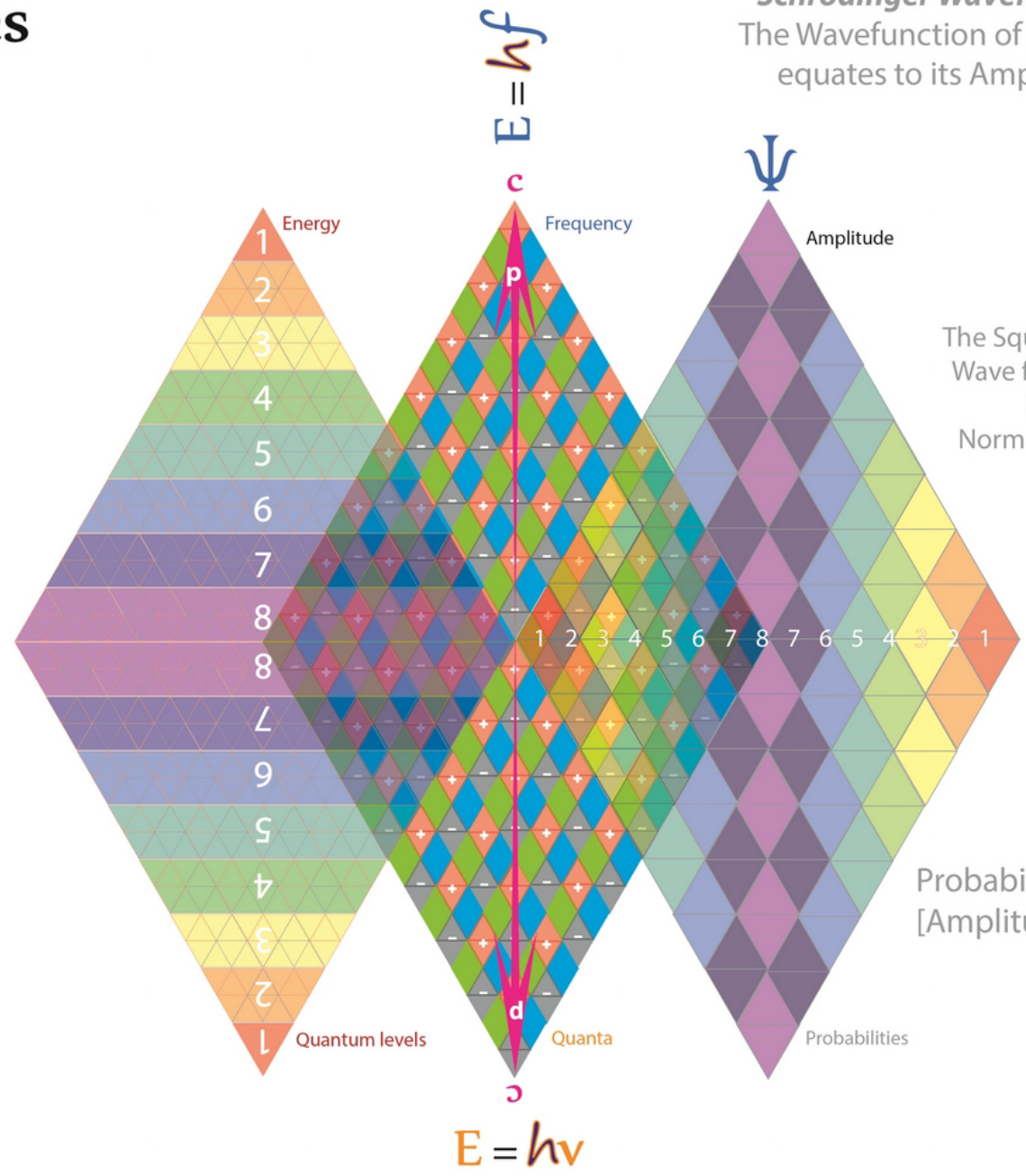


Statisical Probabilities form the Mathematical basis for Quantum Mechanics



Schrodinger Wavefunction

The Wavefunction of a Particle equates to its Amplitude



The Square of a Wave function is Normalizable

Probability = [Amplitude] 2

Born Probability Rule

The Probability of finding a Particle is the Square of its Amplitude

Wave Particle Duality

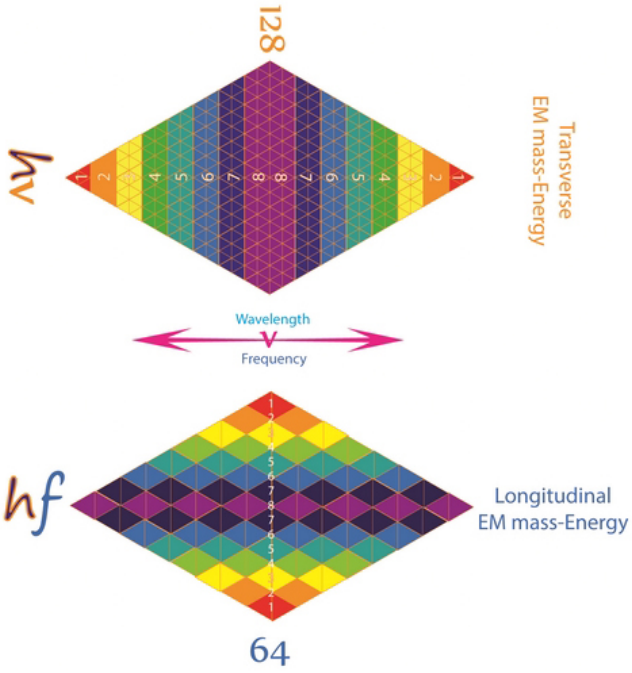
2D fields combine to form 3D Tetryonic Matter

All Matter exhibits
Wave-Particle duality

Everything is made up of
Charged mass-Energy quanta

ZPFs combine in ODD numbers to form
Bosons

Bosons combine to form
Quantum Levels



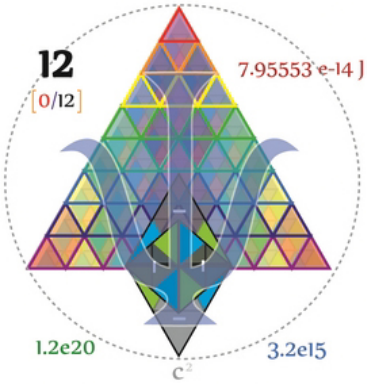
Quantum level ZPFs
in Matter can also be modelled with
Wave Probability mechanics

Bosons

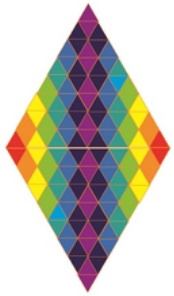
$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field · Planck quanta · Bosons · ElectroMagnetic · mass · velocity

$E = hv$



$E = hf$

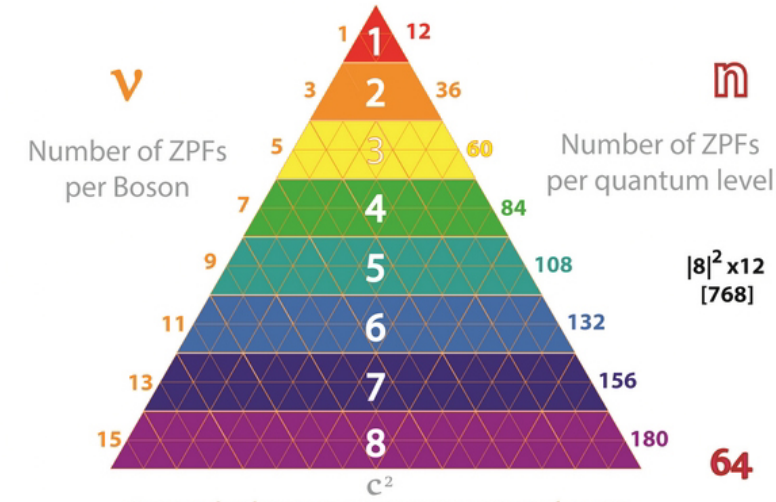


Photons

$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

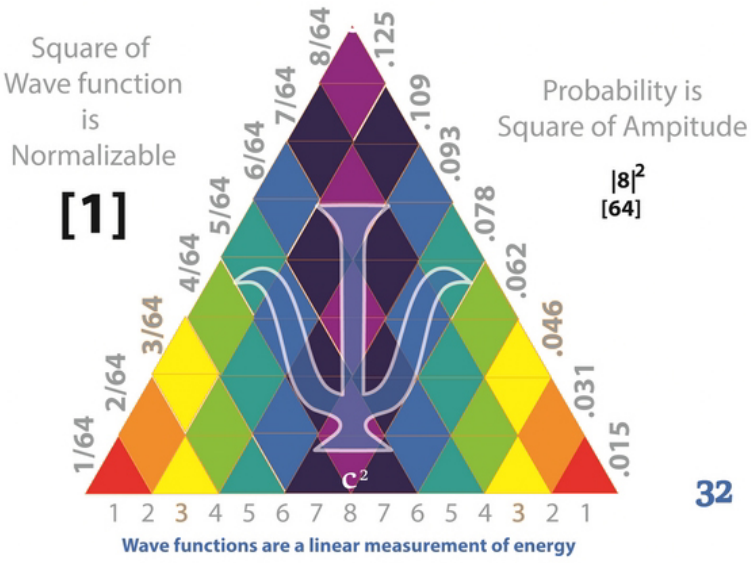
EM Field · Planck quanta · Photons · ElectroMagnetic · mass · velocity

A n8 Electron is a massive particle
which has a Kinetic EM energy field
[6.4e15 planck quanta]



Quantum levels are a trasnverse measurement of energy

Equivalently, all Matter & EM waves can be viewed either in terms of their Bosonic or Photonic (transverse or longitudinal) geometries and associated Energy properties



Wave functions are a linear measurement of energy

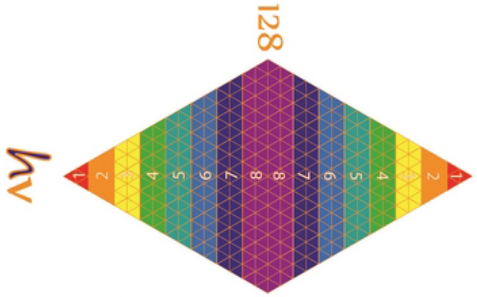
Wave~Particle energies

All Matter in motion exhibits a Wave-Particle duality

Everything is made up of
Charged mass-Energy quanta

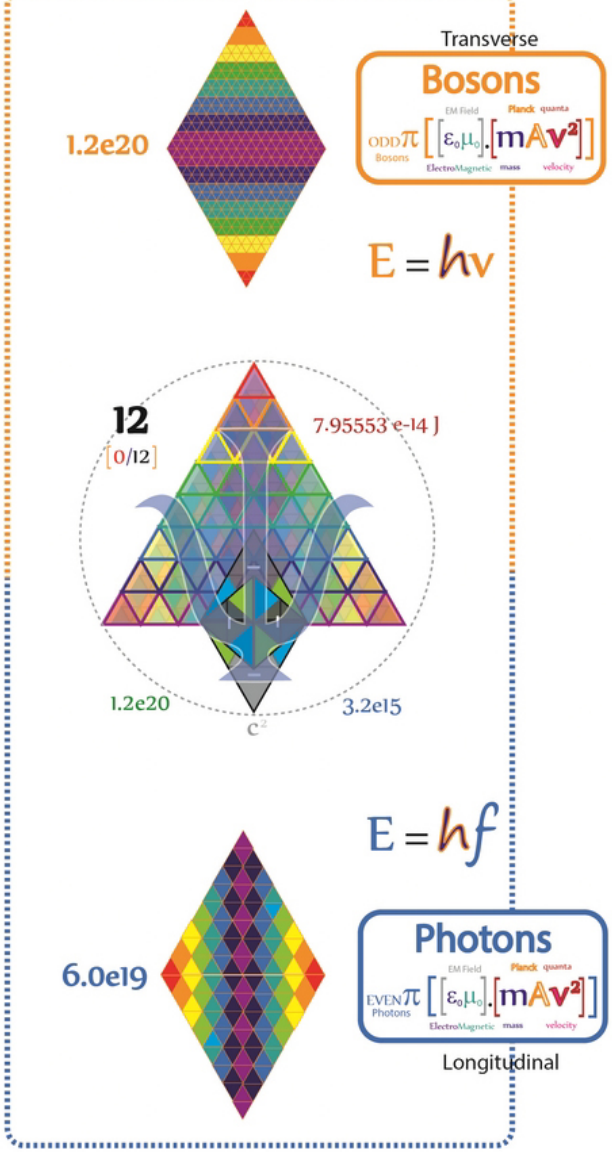
ZPFs combine in ODD numbers to form
Bosons

Bosons combine to form
Quantum Levels



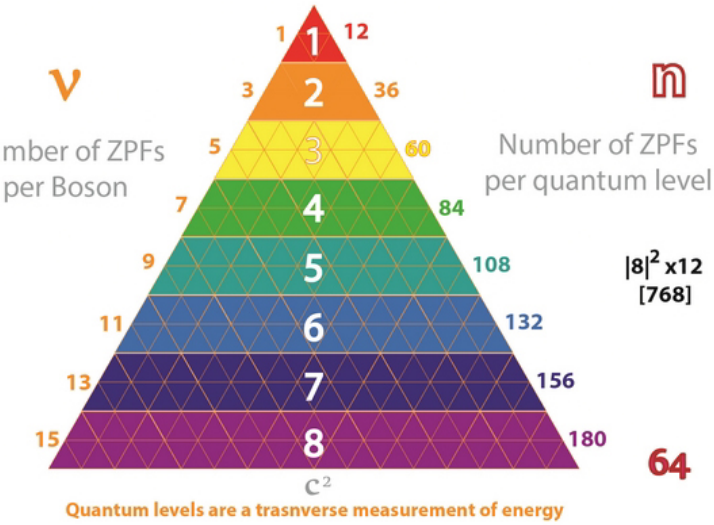
Quantum level ZPFs
in Matter can also be modelled with
Wave Probability mechanics

Equilateral energy is the foundational geometry
of Kinetic EM Waveforms [WAVES]
and standing wave Matter [PARTICLES]



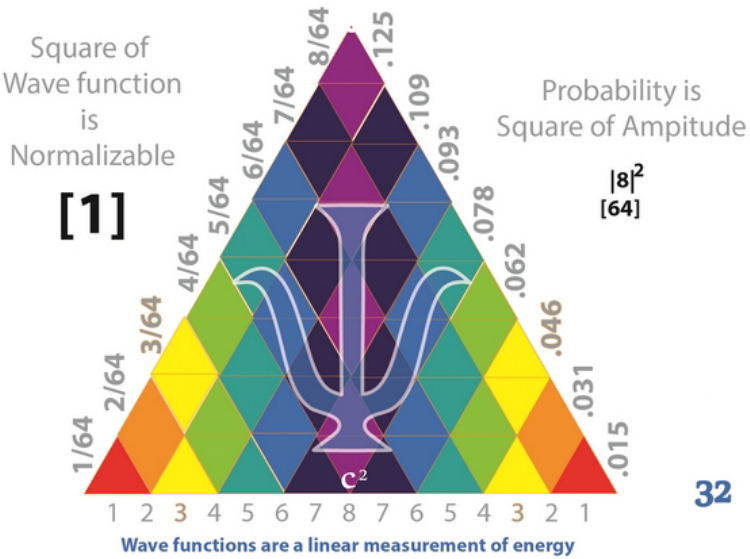
A n8 Electron is a massive particle
which has a Kinetic EM energy field
[6.4e15 planck quanta]

2D EM fields combine to form 3D Tetryonic Matter



Quantum levels are a trasnverse measurement of energy

Equivalently, all Matter & EM waves can be viewed either in terms of their Bosonic or Photonic (transverse or longitudinal) geometries and associated Energy properties

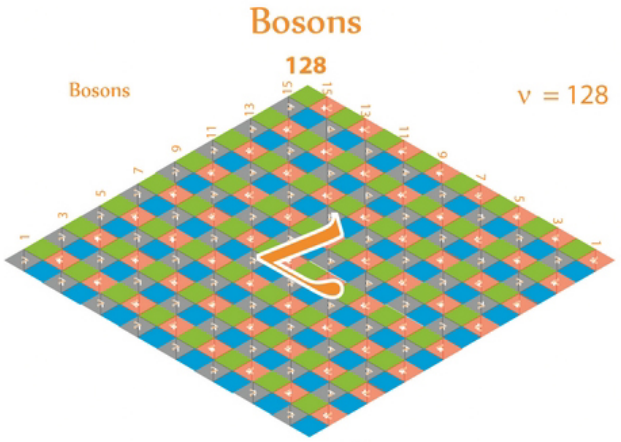


Wave functions are a linear measurement of energy

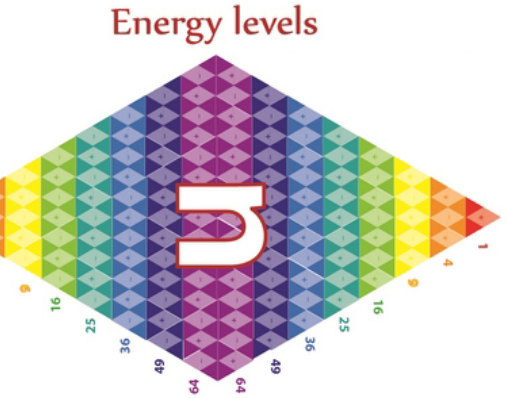
Wave functions

Transverse EM Waveforms

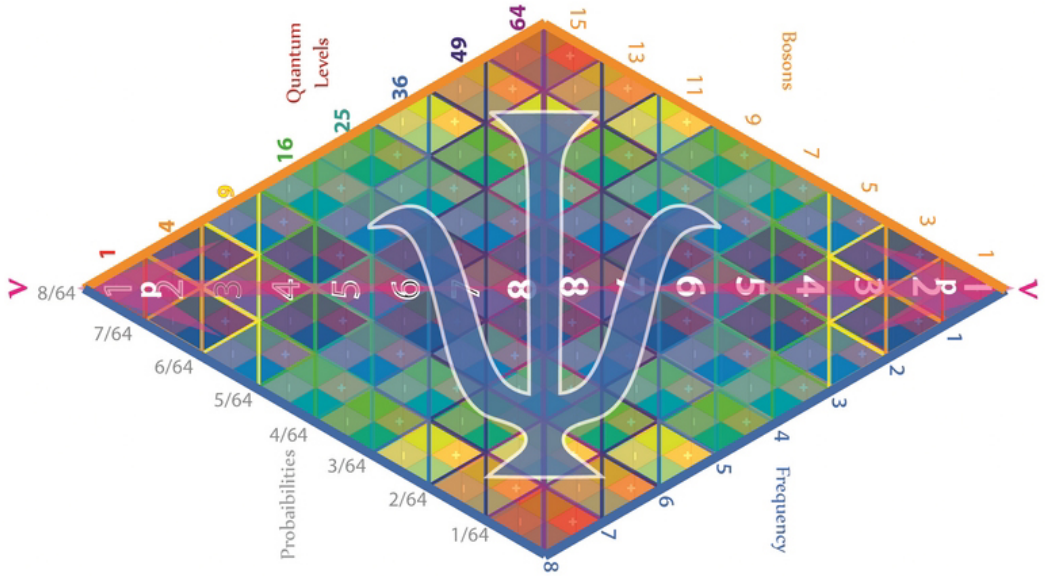
All EM waves and Photons exhibit
Quantum levels of energy
determined by their
constituent Bosons



$E = h\nu$



All EM waves are comprised
of Longitudinal Photons
which in turn are made up
of Transverse Bosons
[ZPFs are single-quanta Bosons]



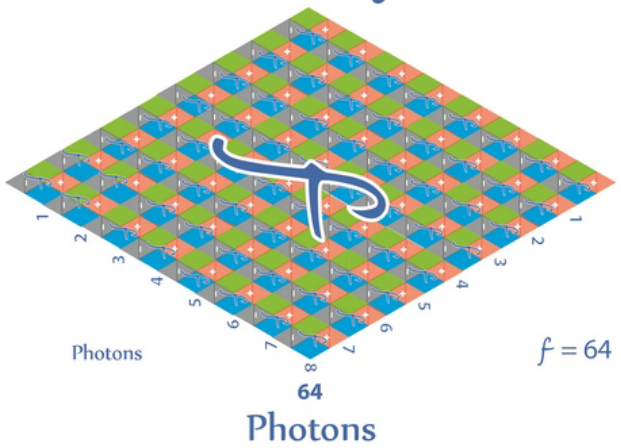
Wave-particle duality holds that light and matter simultaneously exhibit properties of waves and of particles (or photons).

This concept is a consequence of quantum mechanics and a comprehensive explanation of this duality has been elusive to Physics since its discovery.

Any attmpt to develop an unified quantum theory must explain the root cause and processes behind Wave-Particle duality and must also explain:

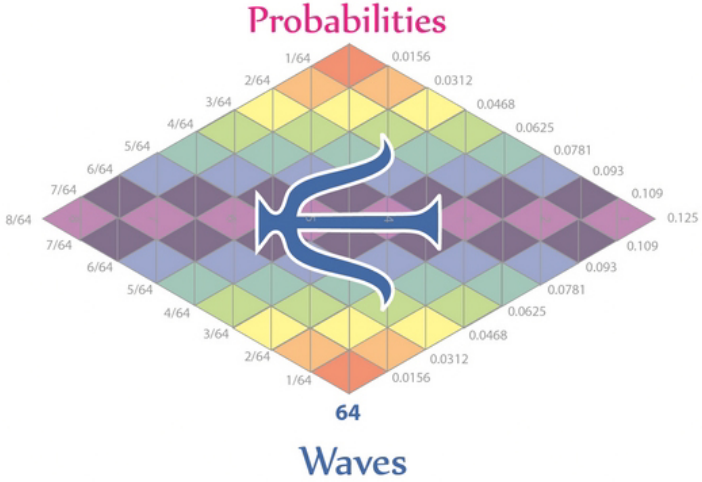
Diffraction, Deflection and Reflection along with Photons, EM radiation, Quantum Levels and Matter.

$E = hf$



Longitudinal EM waveforms

All EM waves and Photons exhibit
Wave probability and amplitude functions



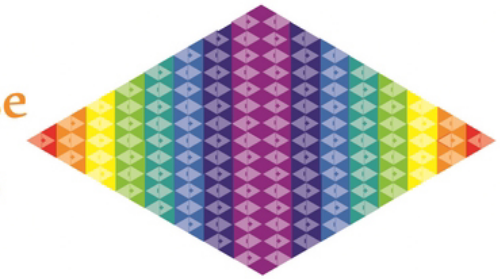
Light as Waves and Particles

$$\text{EVEN}\,\pi\ \text{EM waves}\ \left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Bosons

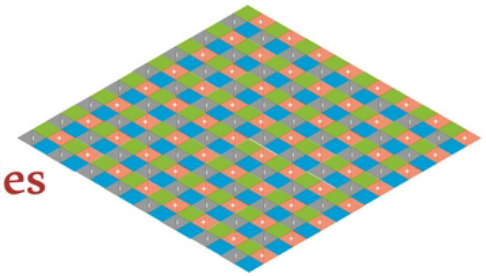
Transverse Particles

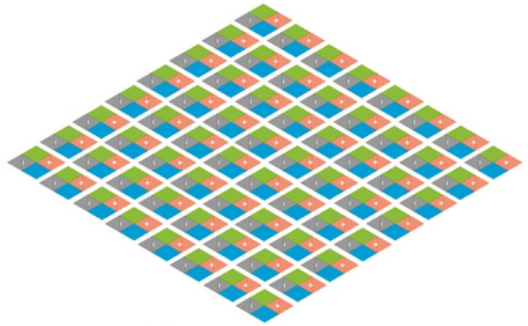


Quantum levels

n1-8

Scalar EM mass-Energies



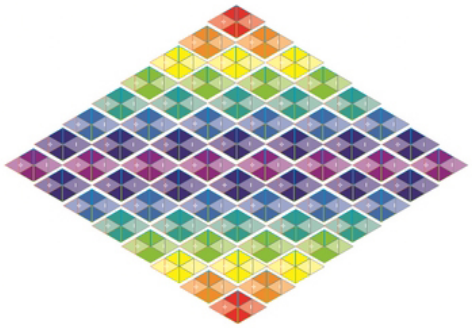


Frequency

64

Linear Waves

Photons

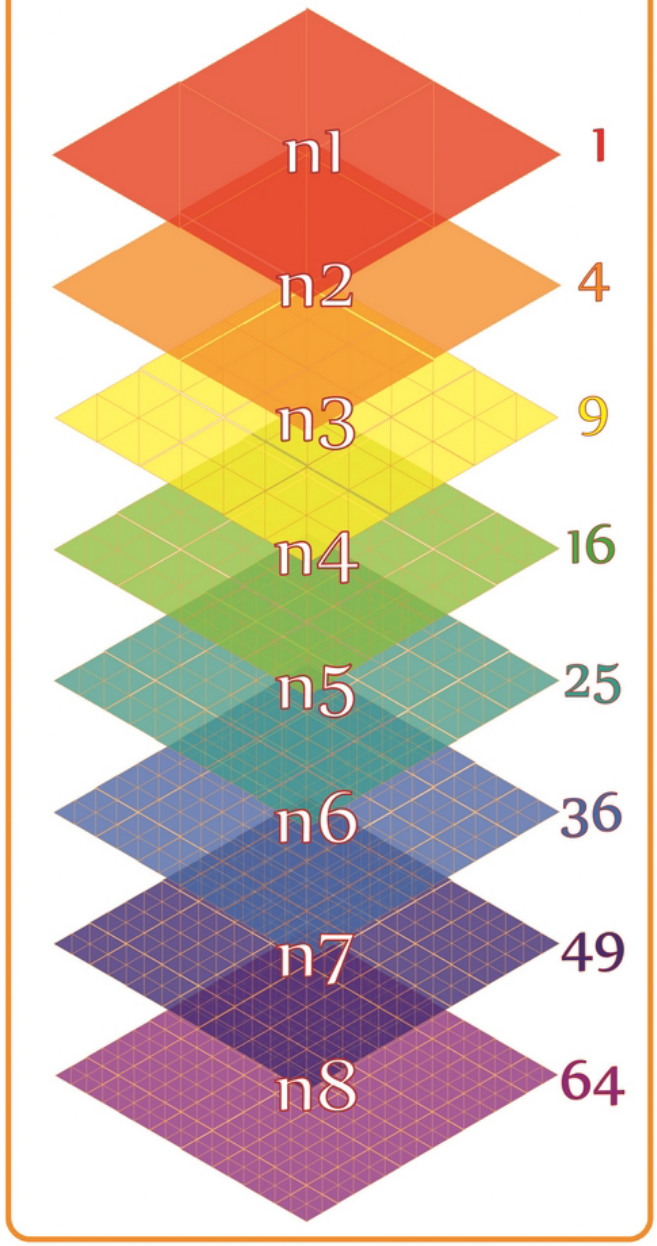


1 2 3 4 5 6 7 8 7 6 5 4 3 2 1

Amplitudes

/64

White light is comprised of superpositioned EM waves



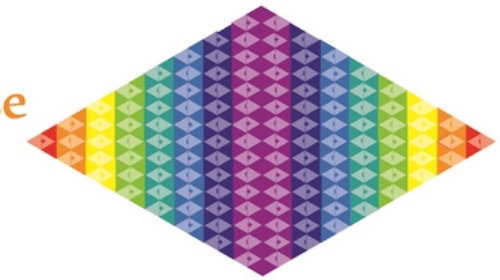
White Light waveform geometries

$$\text{EVEN}\,\pi\,[[\varepsilon_0\mu_0].[mAv^2]]$$

EM Field (EM waves) · Planck quanta · ElectroMagnetic · mass · velocity

Bosons

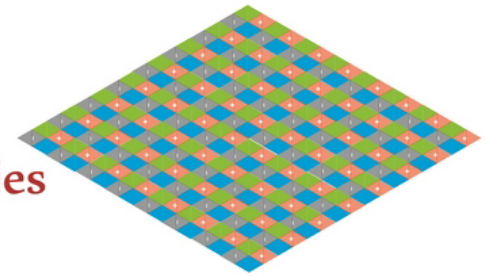
Transverse Bosons

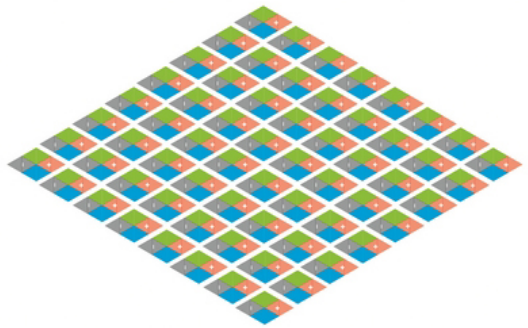


Quantum levels

n1-8

Scalar EM mass-Energies



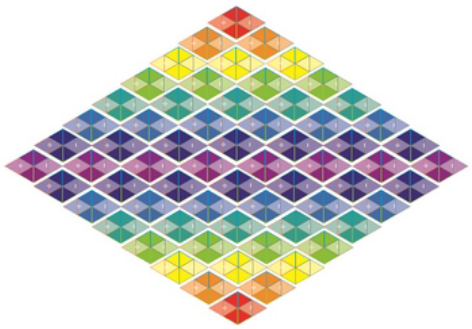


Frequency

64

Linear Photons

Photons

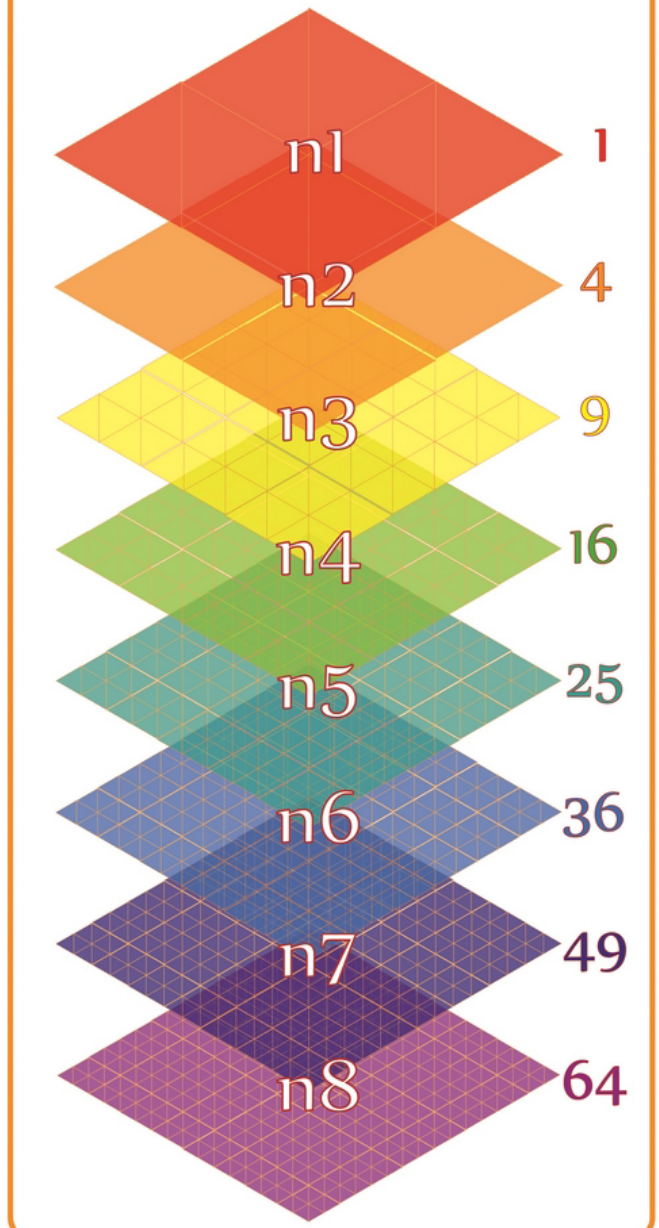


1 2 3 4 5 6 7 8 7 6 5 4 3 2 1

Amplitudes

/64

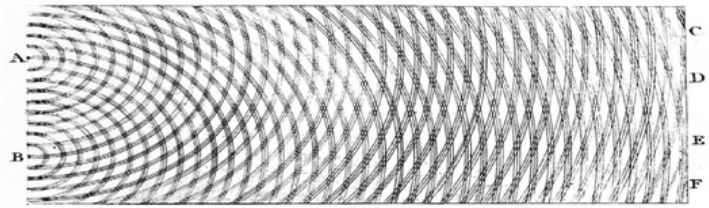
White light is comprised of superpositioned EM waves



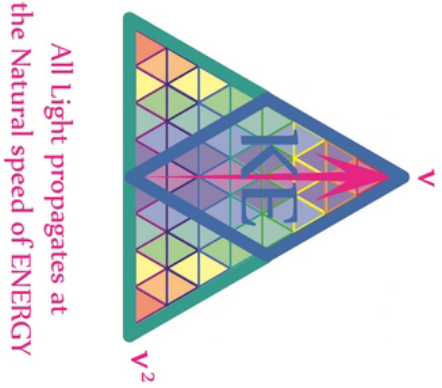
Light waves

Light, which is emitted and absorbed in tiny "packets" called photons, exhibits properties of both waves and particles, often referred to as wave–particle duality.

The study of light, known as optics, is an important research area in modern physics and has been the source of much debate as to the true nature of Light



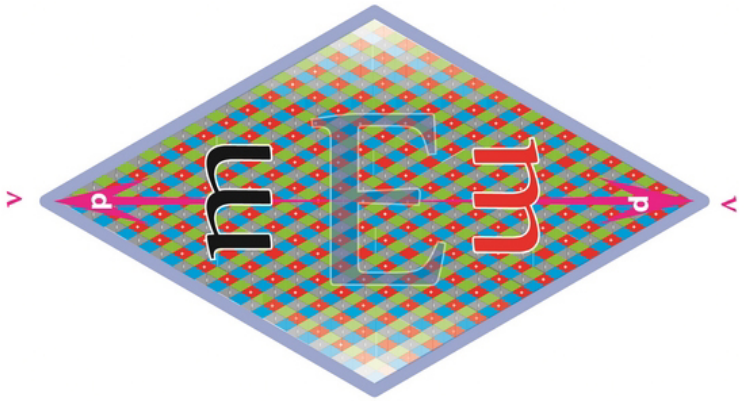
Tetryonics reveals the True geometry of Light and finally dispels the misconceptions surrounding its 'wave-like' properties



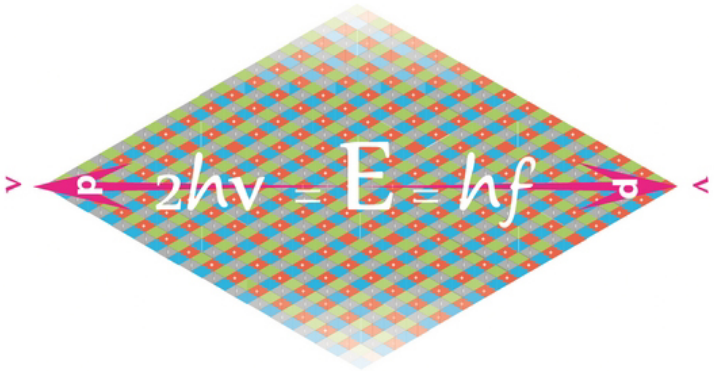
$$KE = \frac{1}{2}Mv^2$$

Photons are radiative Kinetic EM mass-Energies

$$E_\gamma = 2mv^2$$



All EM waves are composed of Transverse EM mass-Energies [Bosons]



All EM waves are composed of Longitudinal EM mass-Energies [Photons]

All EM waves have Particle geometries that can be assigned probabilities due to their associated wavefunctions

Thomas Young

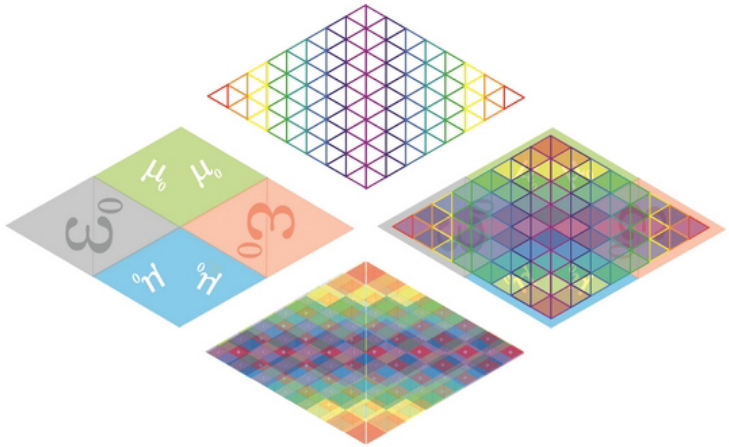
(13 June 1773 – 10 May 1829)

$$E = mv^2$$

"The term energy may be applied, with great propriety, to the product of mass or weight of a body, into the square of the number expressing its velocity.

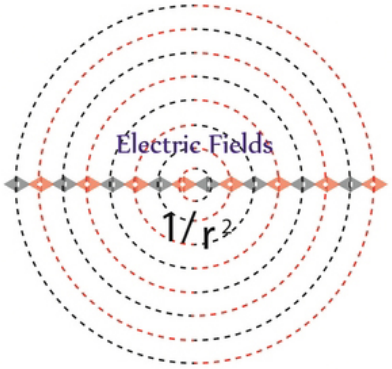
Thus, if the weight of one ounce moves with a velocity of a foot in a second, we call its energy 1; if a second body of two ounces has a velocity of three feet in a second, its energy will be twice the square of three, or 18."

$$p^2 = KEM = Mv^2$$



EM wave radiation

EM waves are measured electrically as radial E-wave radiation patterns

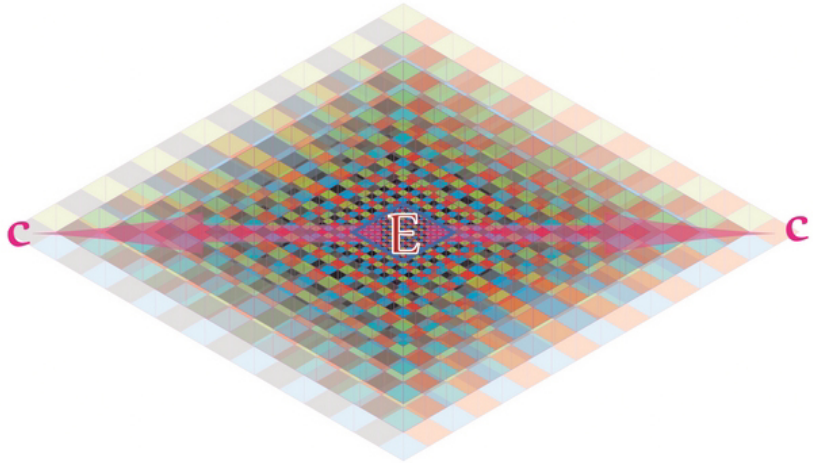


Electric and Magnetic energies propagate orthagonally to each other

Photons and EM waves propagate outwards from their source at 'c'
(299,792,456 m/s)

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field — Planck quanta
ElectroMagnetic — mass — velocity



$$\text{EVEN}\,\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

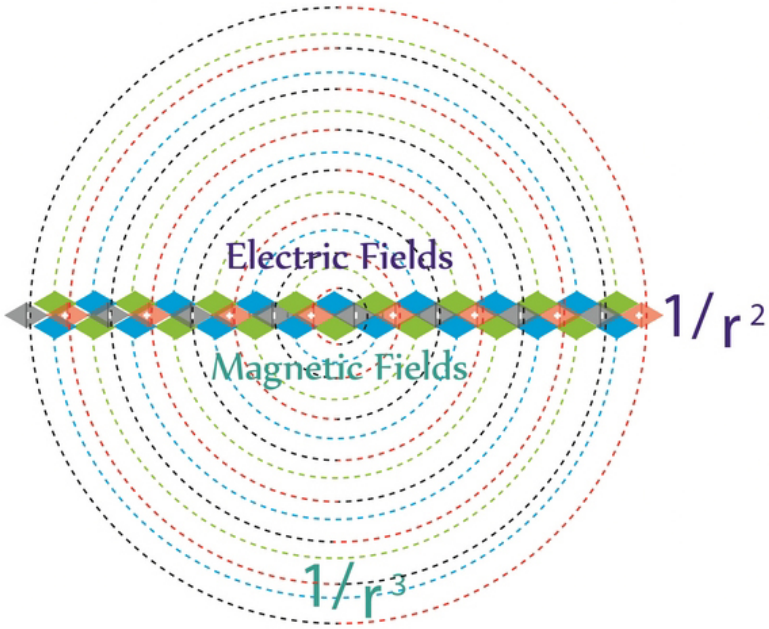
EM Field — Planck quanta
ElectroMagnetic — mass — velocity

Photons and EM waves have dual c^2 geometries
($8.987551787e16$ m^2/s^2)

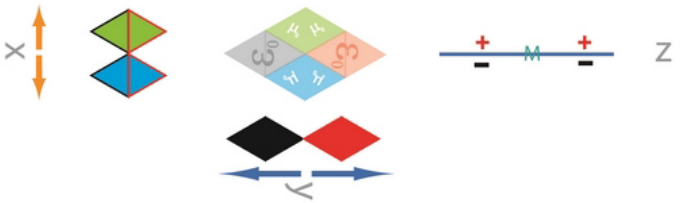
EM waves are planar [2D] Energy waveforms

EM waves are comprised of longitudinal [EM mass] Photons which in turn are comprised of transverse [EM mass]Bosons

Electro-Magnetic Fields



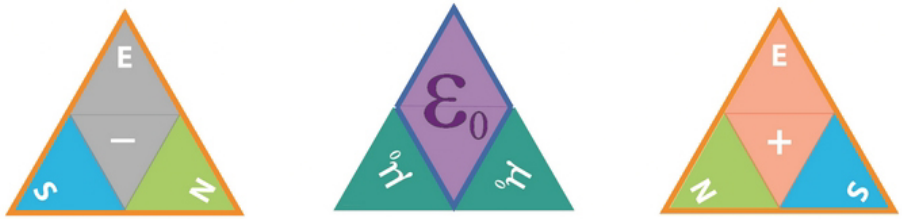
Like a sheet of Paper or a coin Photons and EM waves have a minimal [non-Zero] Z component to their energies



Photon-EM Wave Superpositioning

In physics, the Superposition principle, also known as superposition property, states that, for all linear systems, the net response at a given place and time caused by two or more stimuli is the sum of the responses which would have been caused by each stimulus individually.

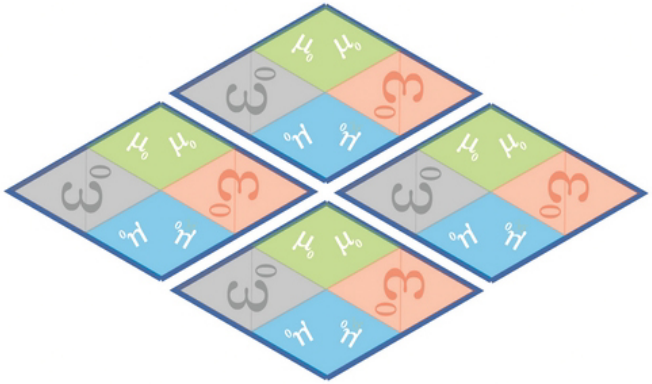
Negative quantum state is one side of the quantum energy coin



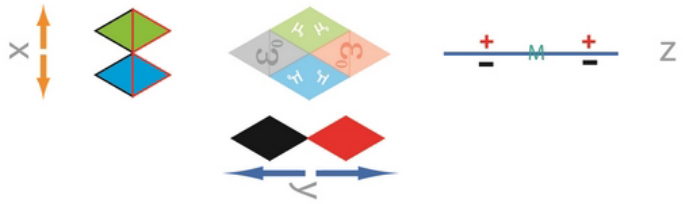
Positive quantum state is other side of the quantum energy coin

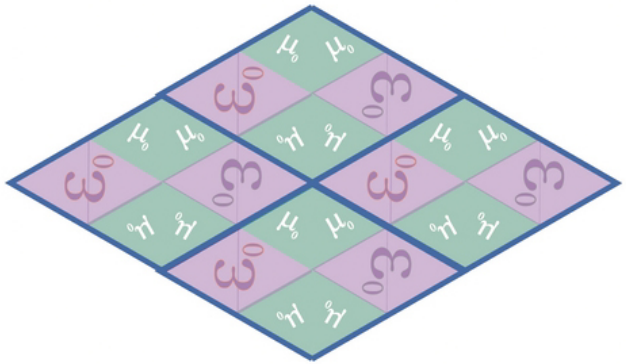
Photons are Neutral EM wavepackets

$$F(\gamma_1 + \gamma_2) = F(\gamma_1) + F(\gamma_2)$$



Like a sheet of Paper or a coin
Photons and EM waves have a minimal [non-Zero] Z component to their energies





$$F(\psi_1 + \psi_2) = F(\psi_1) + F(\psi_2)$$

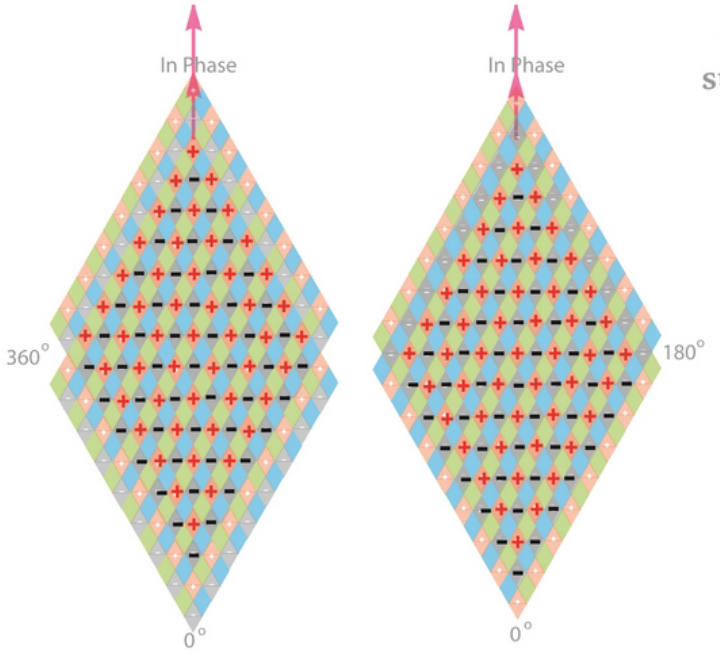
It is the superpositioning of EM waveforms that creates Coulombic forces and White Light

Wave Interference

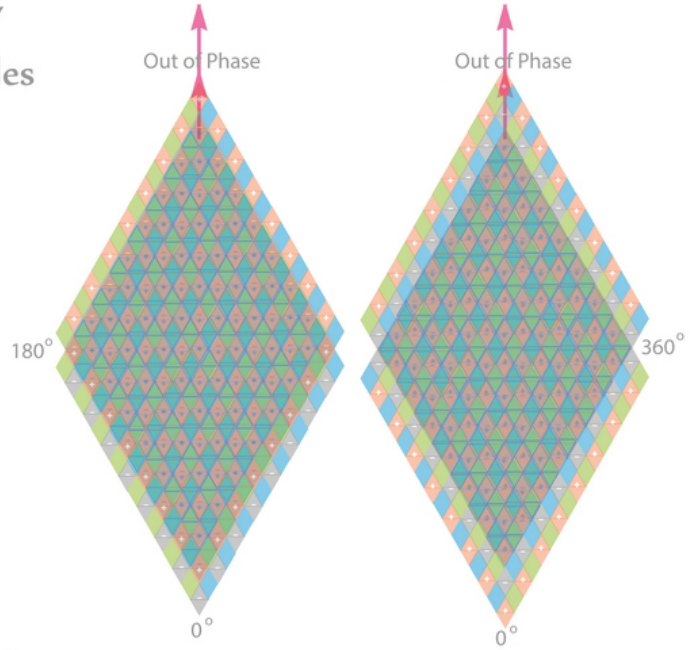
Constructive Interference

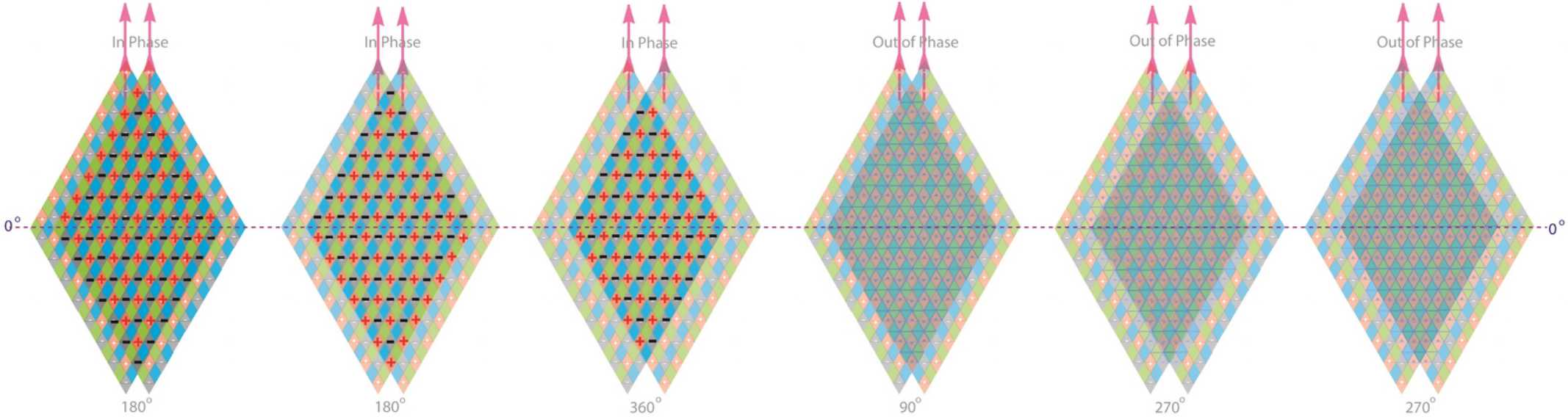
Destructive Interference

Bosons and Photons are
2D EM mass-ENERGY
superpositioned particles



Linear Displacement





Transverse Displacement

Wave phase interference

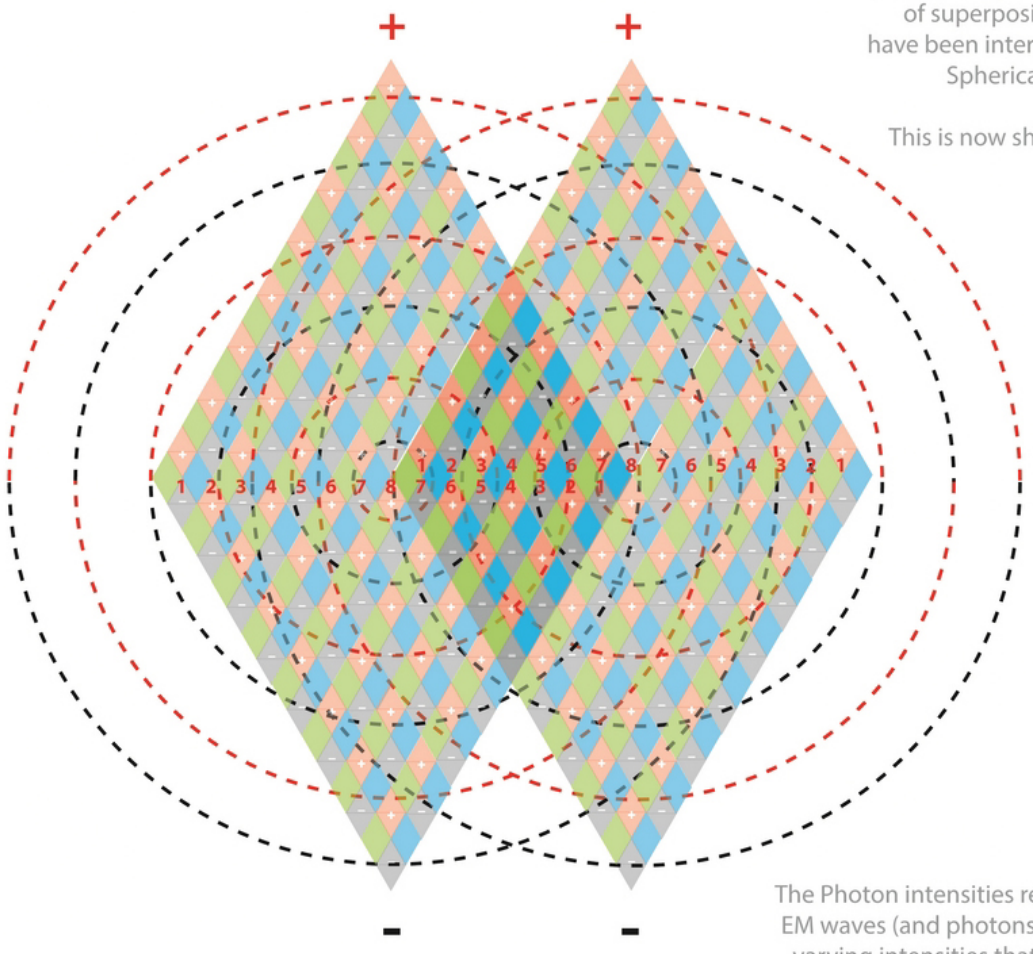
Spherical modelling of EM waves and Photons
is incorrect and must be abandoned as an appropriate model

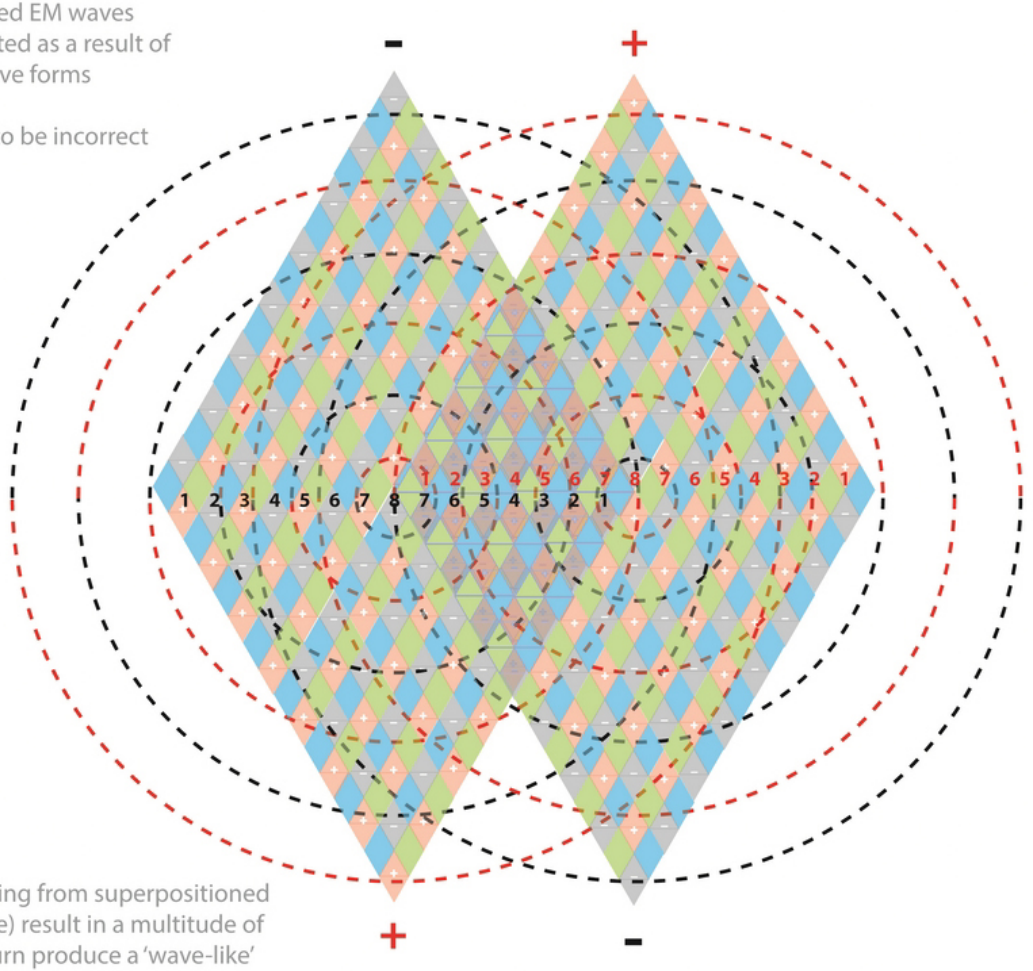
Constructive

The interference patterns
produced by the photon intensities
of superpositioned EM waves
have been interpretted as a result of
Spherical wave forms

This is now show to be incorrect

Destructive





The Photon intensities resulting from superpositioned
EM waves (and photons alike) result in a multitude of
varying intensities that inturn produce a 'wave-like'
interference pattern when measured with respect to
the resulting Electric field intensities.

In Phase waveforms

Out of Phase waveforms

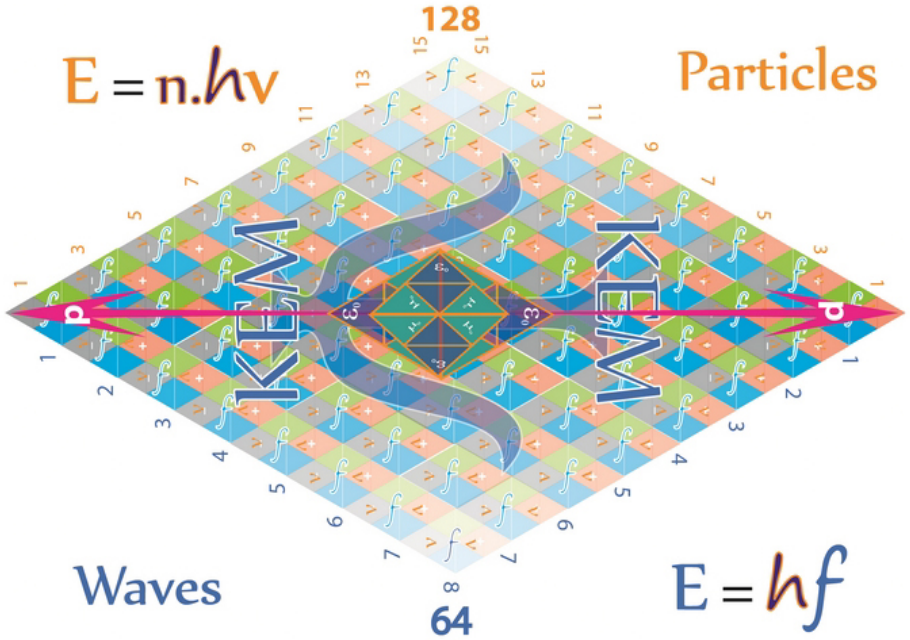
Numerous factors can effect the resultant Photon intensities
namely: Transverse and Longitudinal Phase differences and
the wavelengths of the Photons comprising each EM wave
in superposition as precise measurements are effected

All Matter in motion
has an intrinsic Matter-wave function
and an extrinsic KEM wave function

Transverse Boson properties

$$\text{ODD Bosons}\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field · Planck quanta · ElectroMagnetic · mass · velocity



Wavefunction photon number DISTRIBUTION
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Wave-Particle attributes

$$\text{Photons}\ 2\pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Longitudinal Photon Properties

Photon Intensity

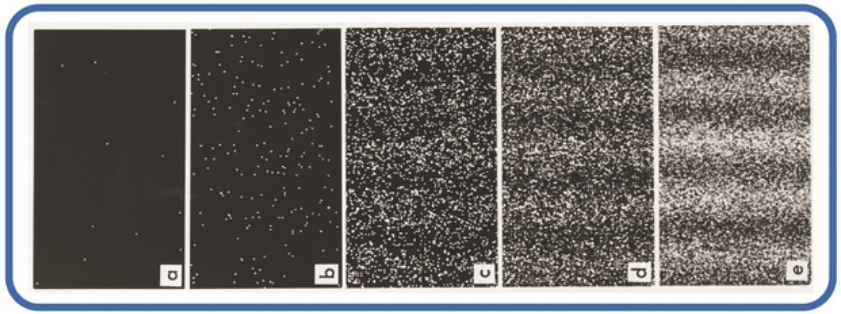
$$\text{EVEN EM waves}\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[mAv^2\right]\right]$$

EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Photon Intensity is a result of the geometry of EM waves
[which in turn is directly proprtional to the velocity of the Matter]

It can be measured in a number of vaying ways:
Transverse EM masses [BOSONS]
Longitudinal EM masses [PHOTONS]
Wavefunction probabilities [WAVEFUNCTIONS] and
Energy intensity, frequency or wavelengths.

The wave-particle nature of Photons-EM waves along with EM mass-Matter waves has been the subject of much debate since Lucretius in 55BC with the debate intensitying with Newton's and Young's differing views on the true cuase of the Photon's wave-Particle nature



Intensity (number) of Photons along with time duration affects pattern produced

The measurement of Photons with the use of Photo-multipliers and Charge coupled Devices results in the measurement of the E field properties of EM waves (producing the long confusing wave-particle results obtained by diffraction gratings)

In turn these results have been historically misinterpreted as a waveform property that cannot be attributed to the particle properties of a Photon.

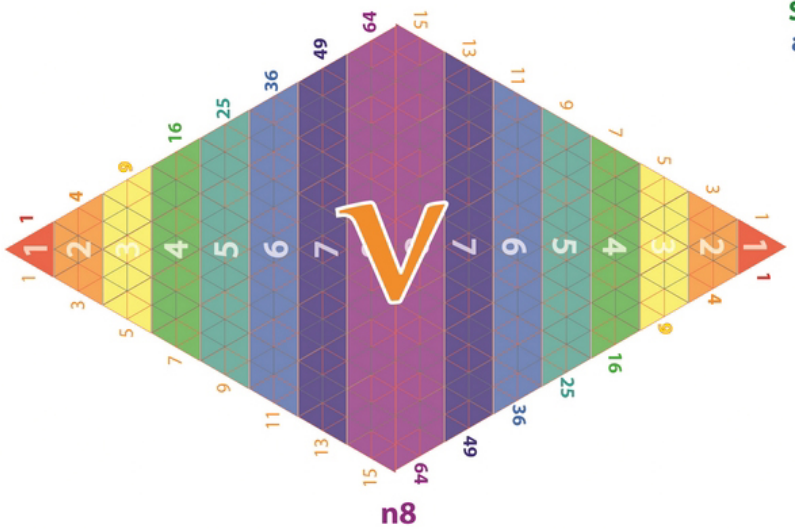
Tetryonic geometry clears this matter up once and for all.

Matter in motion

All Matter in motion produces has both:
Standing wave energy geometry [Particle] and
a Divergent KEM mass-Energy field [KEM Wave]

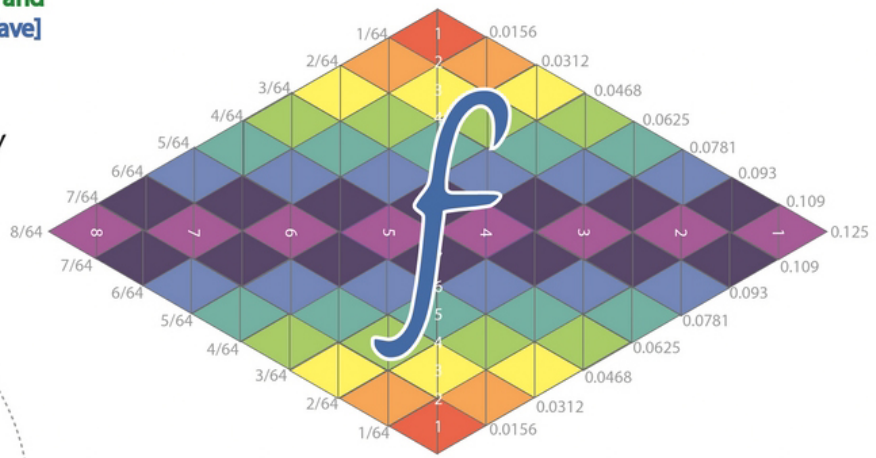
EM induction is effected by
Bosons or Photons

Transverse EM masses



$E = h\nu$

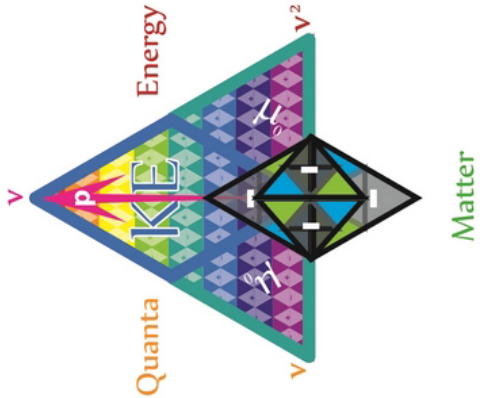
Longitudinal EM masses



f=64

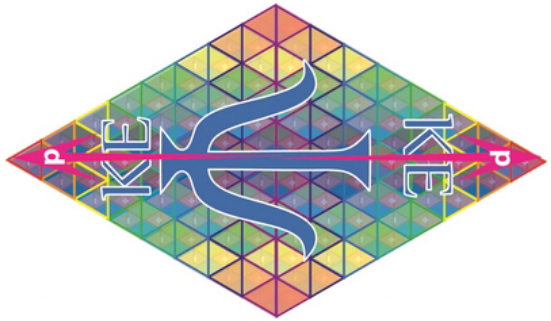
$E = hf$

Negative Charges



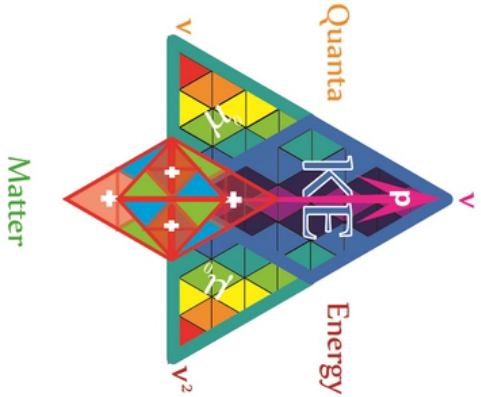
have unidirectional
negative KEM fields

Photons



have bidirectional
neutral KEM fields

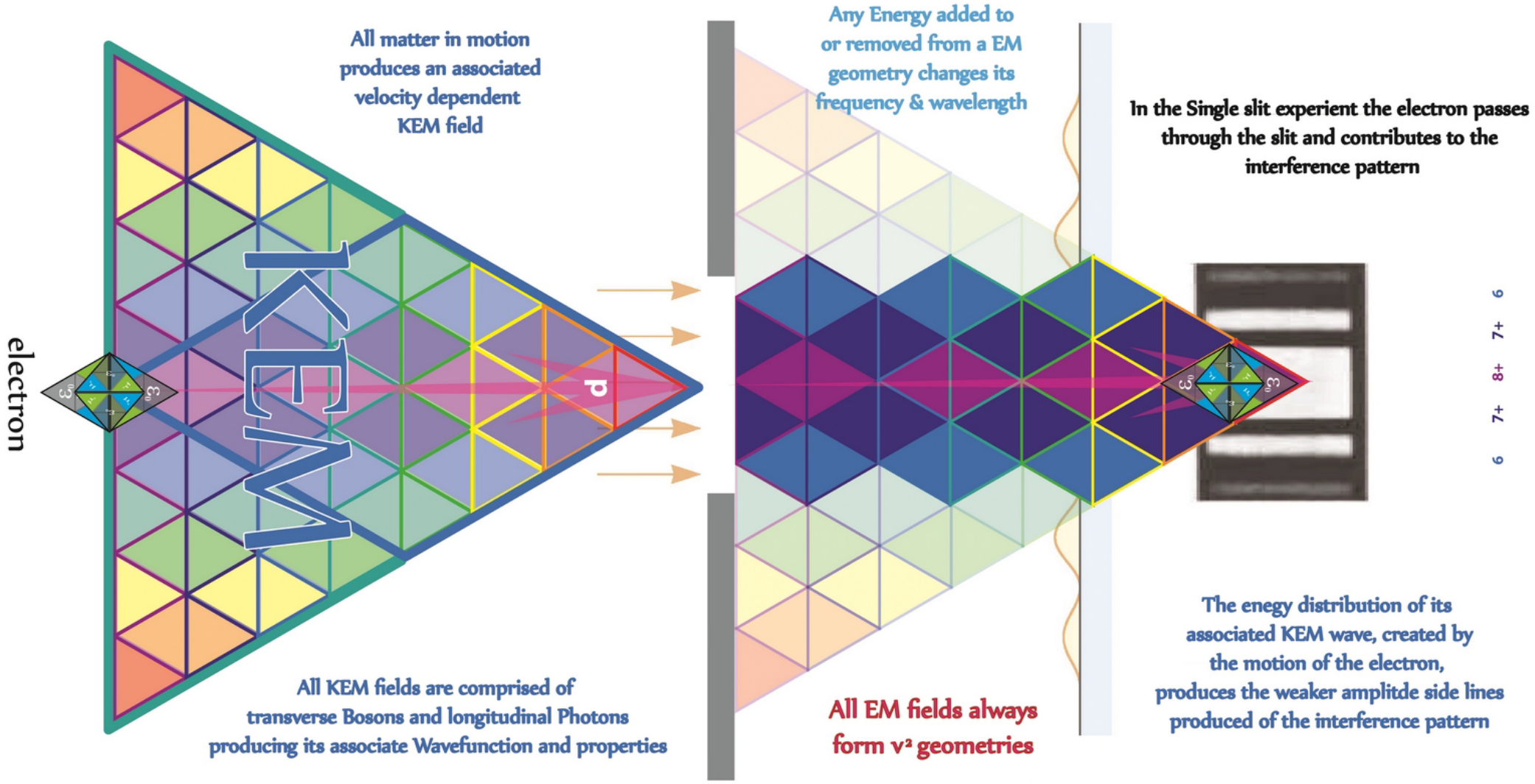
Positive Charges



have unidirectional
positive KEM fields

Single slit experiment

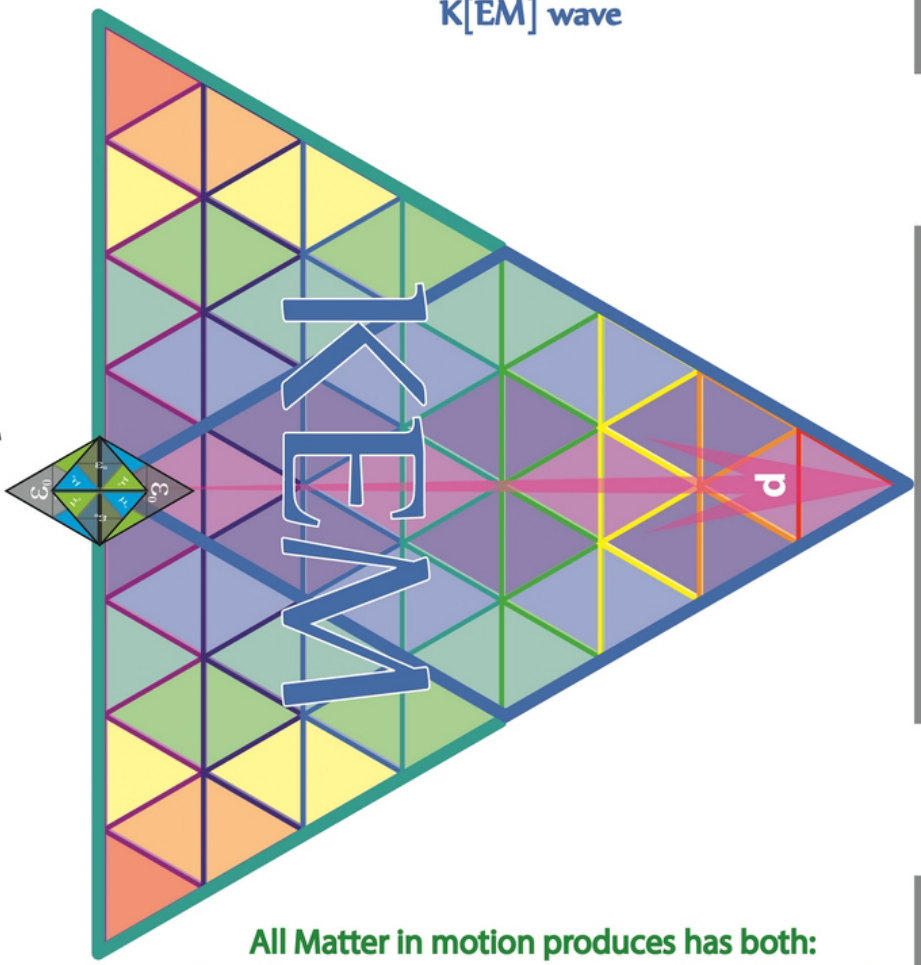
If light consisted strictly of ordinary or classical particles, and these particles were fired in a straight line through a slit and allowed to strike a screen on the other side, we would expect to see a pattern corresponding to the size and shape of the slit. However, when this "single-slit experiment" is actually performed, the pattern on the screen is a diffraction pattern, a fairly narrow central band with dimmer bands parallel to it on each side



KEM field Interference

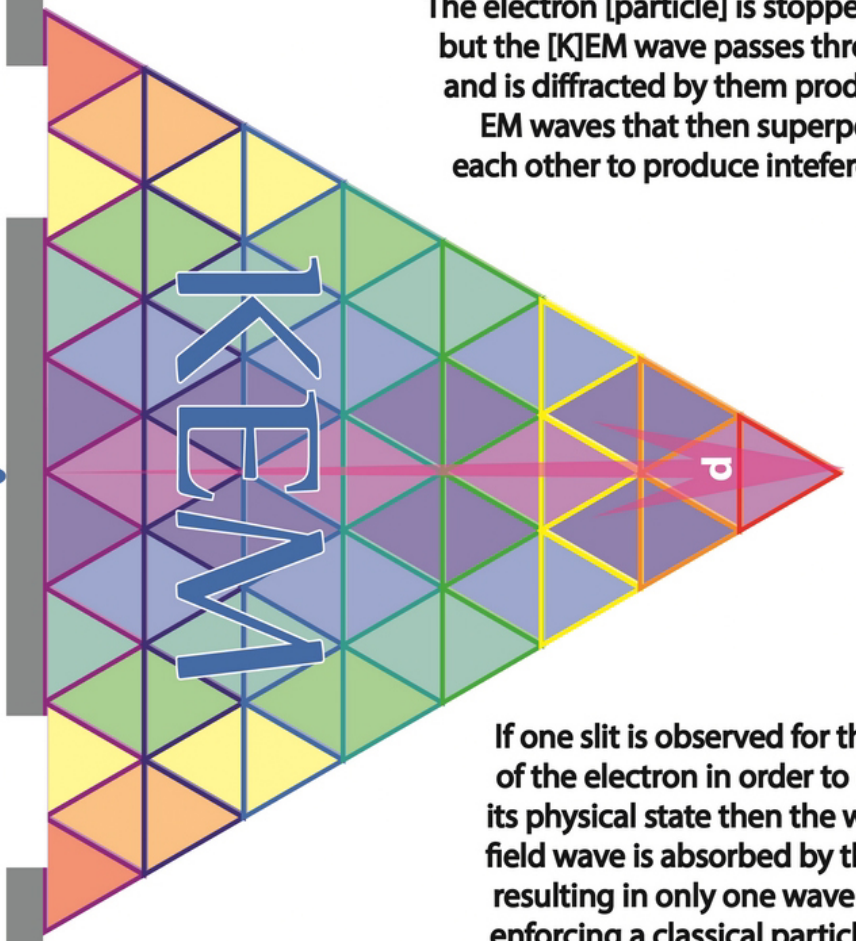
It is not the Particle passing through both slits
that produces an interference pattern
it is the particle's associated
K[EM] wave

electron



All Matter in motion produces has both:
Standing wave energy geometry [Particle] and
a Divergent KEM mass-Energy field [KEM Wave]

The electron [particle] is stopped by the barrier
but the [K]EM wave passes through both slits
and is diffracted by them producing weaker
EM waves that then superposition with
each other to produce inteference patterns



electrons can either
be absorbed by the screen or
'tunnel through' the barrier
and contribute to the
interference pattern

If one slit is observed for the passage
of the electron in order to determine
its physical state then the weaker KEM
field wave is absorbed by the detector
resulting in only one wave remaining
enforcing a classical particle outcome

Double slit experiment

In the basic version of the experiment, a coherent light source such as a laser beam illuminates a thin plate pierced by two parallel slits, and the light passing through the slits is observed on a screen behind the plate. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen — a result that would not be expected if light consisted strictly of particles. However, on the screen, the light is always found to be absorbed as though it were composed of discrete particles or photons.

This establishes the principle known as wave–particle duality.

Additionally, the detection of individual photons is observed to be inherently probabilistic, which is inexplicable using classical mechanics.

Matter absorbs EM wave peak, reduced energy waves produced by the slits in the grating

All Matter in motion produces an associated velocity dependent KEM field

Matter Particle

Similarly charged particles moving in the same direction experieince an attractive force [Ampere]

[K]EM Wave

Whether it is Light itself or the KEM field of Matter in motion all EM fields are comprised of transverse Bosons and longitudinal Photons with probabilistic wave-like properties

Superpositioned KEM waves produce constructive and destructive wave interferences

Superpositioned waves produce the peak values reflective of the incident EM wave

The Compton frequency of any [K]EM wave is comprised of identical wavelength Photons which can combine to produce interference patterns

Result inteference pattern (and its peak amplitude) are teh result of superpositioned EM wave geometries

The double-slit experiment, sometimes called Young's experiment, is a demonstration that matter and energy can display characteristics of both waves and particles, and demonstrates the fundamentally probabilistic nature of quantum mechanical phenomena.

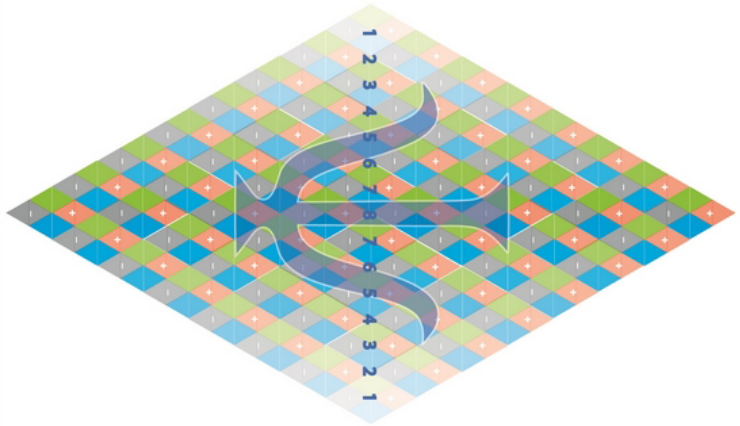
Any detctor placed after the screen will remove energy from the secondaryKEM fields and affect the interference patterns produced

Interference Patterns

When EM waves pass through the slits they are detected as longitudinal 'chains' of photons of varying strengths producing the impression of a interference pattern

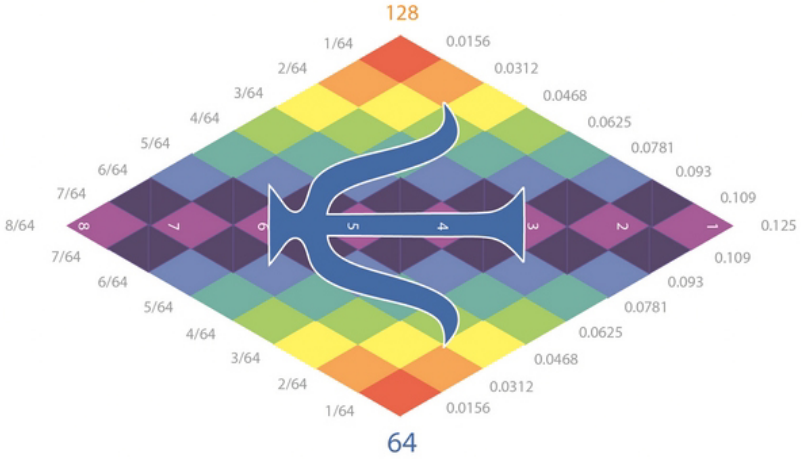
Every EM wave is comprised of indentical specific wavelength photons which are arranged in a Normal distribution resulting from the EM wave's Wavefunction with a peak value equal to the wave's Amplitude

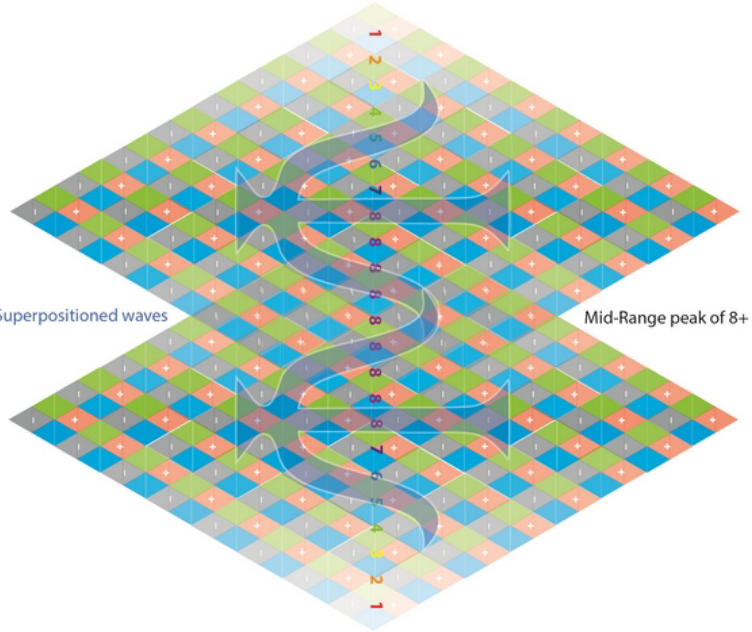
[the square root of the EM wave's total Wavefunction/Probability number]



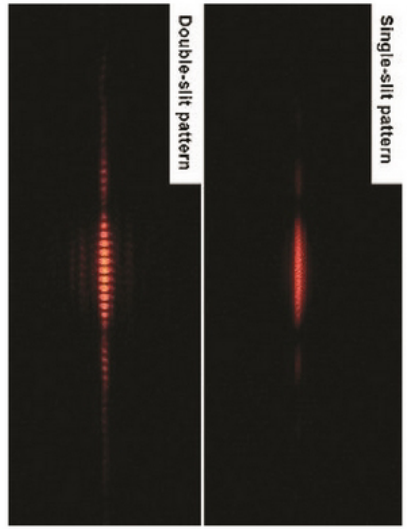
Photons impact screens and photo-detectors with intensities that are determined by their Distribution curves

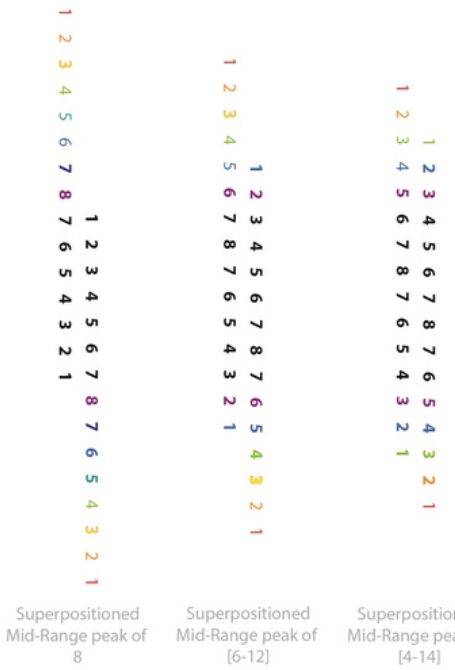
The resultant amplitudes are a direct result of the Phase of the Superpositioned photons within EM waves





Of note is the fact that ALL EM mass-ENERGY Matter being comprised of Energy-momentum quanta are capable of producing interference patterns



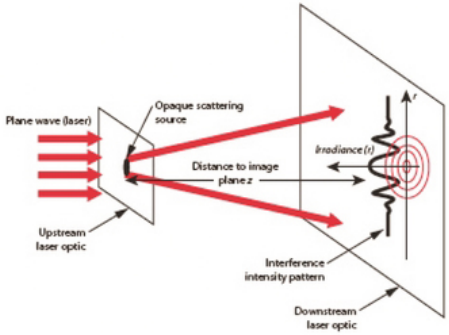


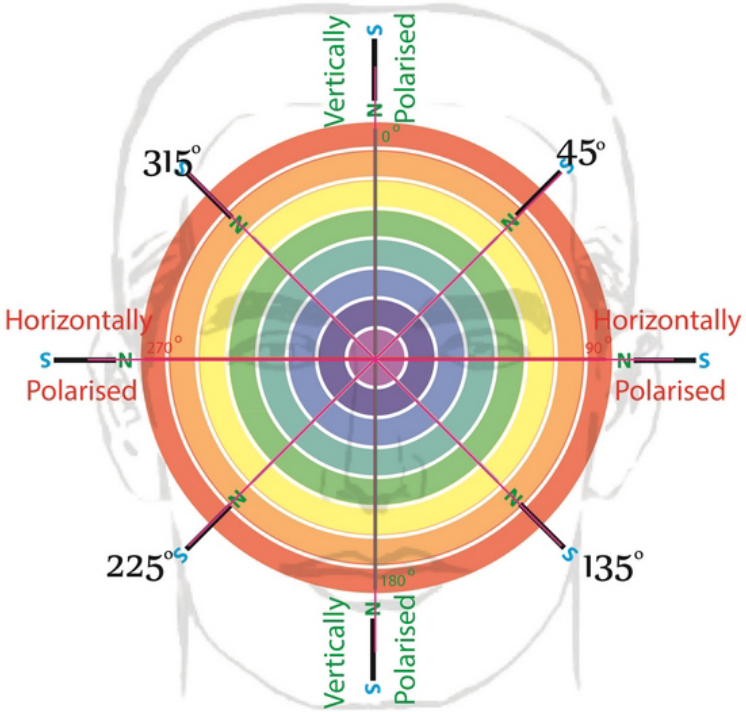
The strength of the maximum photon amplitude in the resultant interference patterns is determined by the constructive/destructive superpositioning of photons in each wave

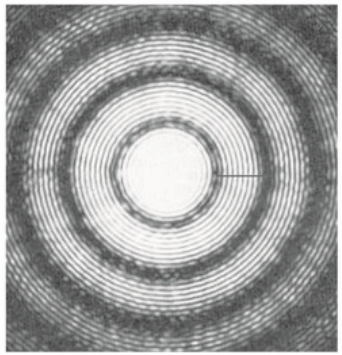
Explaining the wave patterns currently accounted for by Wave theory

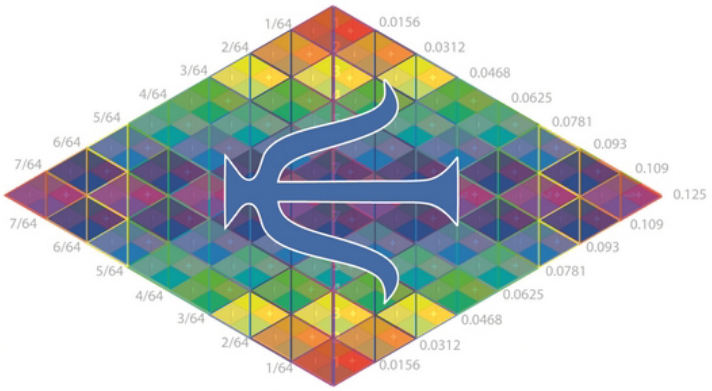
Diffraction Rings

Un-Polarised Photons and EM waves produce circular diffraction patterns





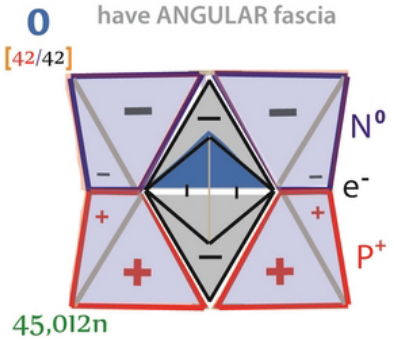




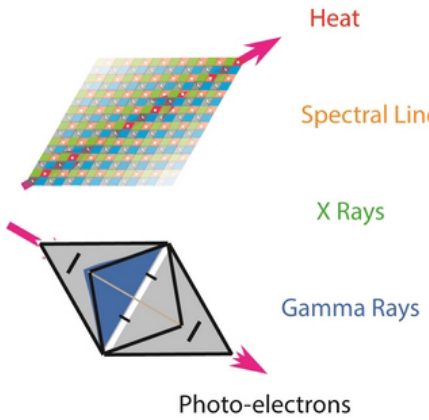
Polarised Photons and EM waves produce linear diffraction patterns

Light wave Reflection

All Atoms and Molecules have ANGULAR fascia



Excited (or higher energy) Atoms and Molecules can emit light and energy via Electro-dynamics

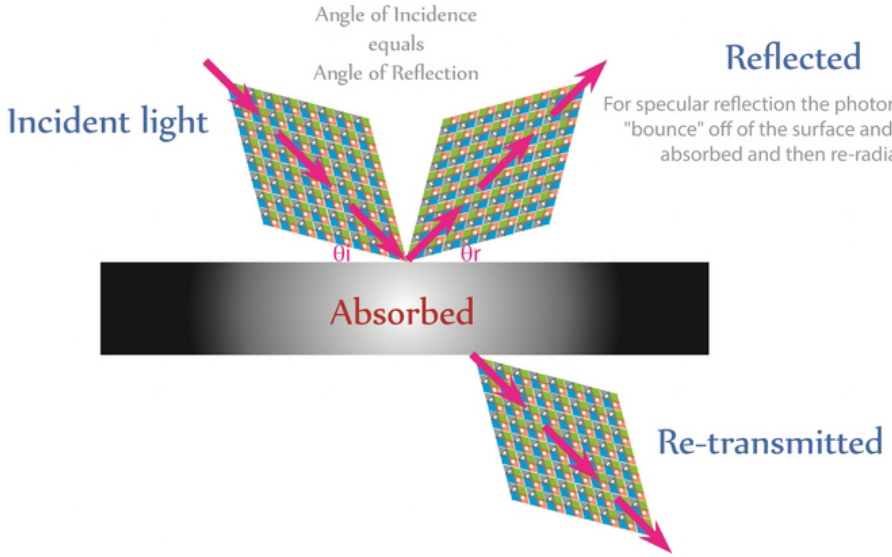


The emitted photon/particle can go in any direction so this is the mechanism for diffuse reflection/radiation.

Incoming light interacts with a surface and may be absorbed, refelected, and/or transmitted.

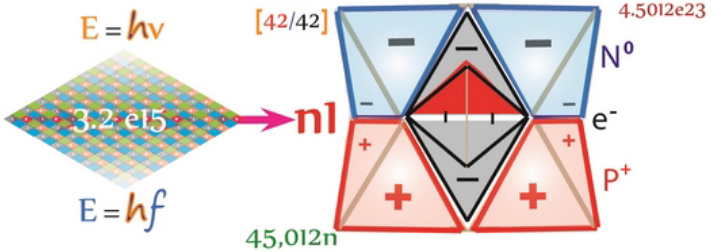
Materials have a reflectance spectrum which is a function of the angle of incidence of the incoming light.

The color of an object is a function of the color spectrum of the incident light and the reflectance spectrum of the object's surface.



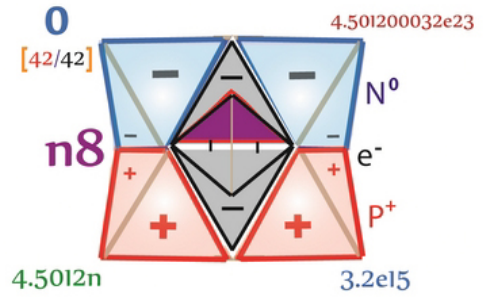
For specular reflection the photons actually "bounce" off of the surface and are not absorbed and then re-radiated

Photon Re-Transmission



When a photon strikes a atom or molecule it generally imparts EM energy as heat and the photon is absorbed

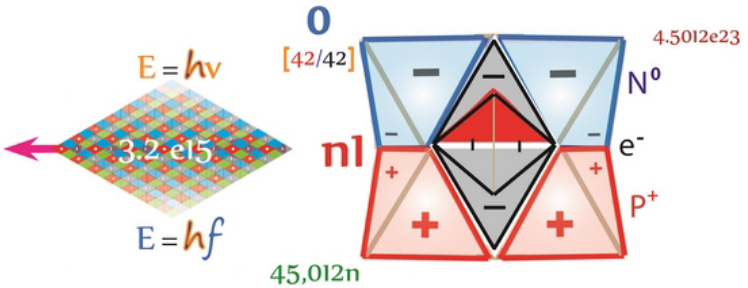
Photon absorption



For some photons their EM energy is equal to the resonance energy of the molecule.

When this happens the photon is absorbed and the molecule is put into an excited state

Photon emission



The molecule relaxes from the excited state back to the ground state by emitting a photon with EM energy equal to that of the original photon so the photon appears to have been reflected (but is actually absorbed then emitted)

Lightwave Refraction

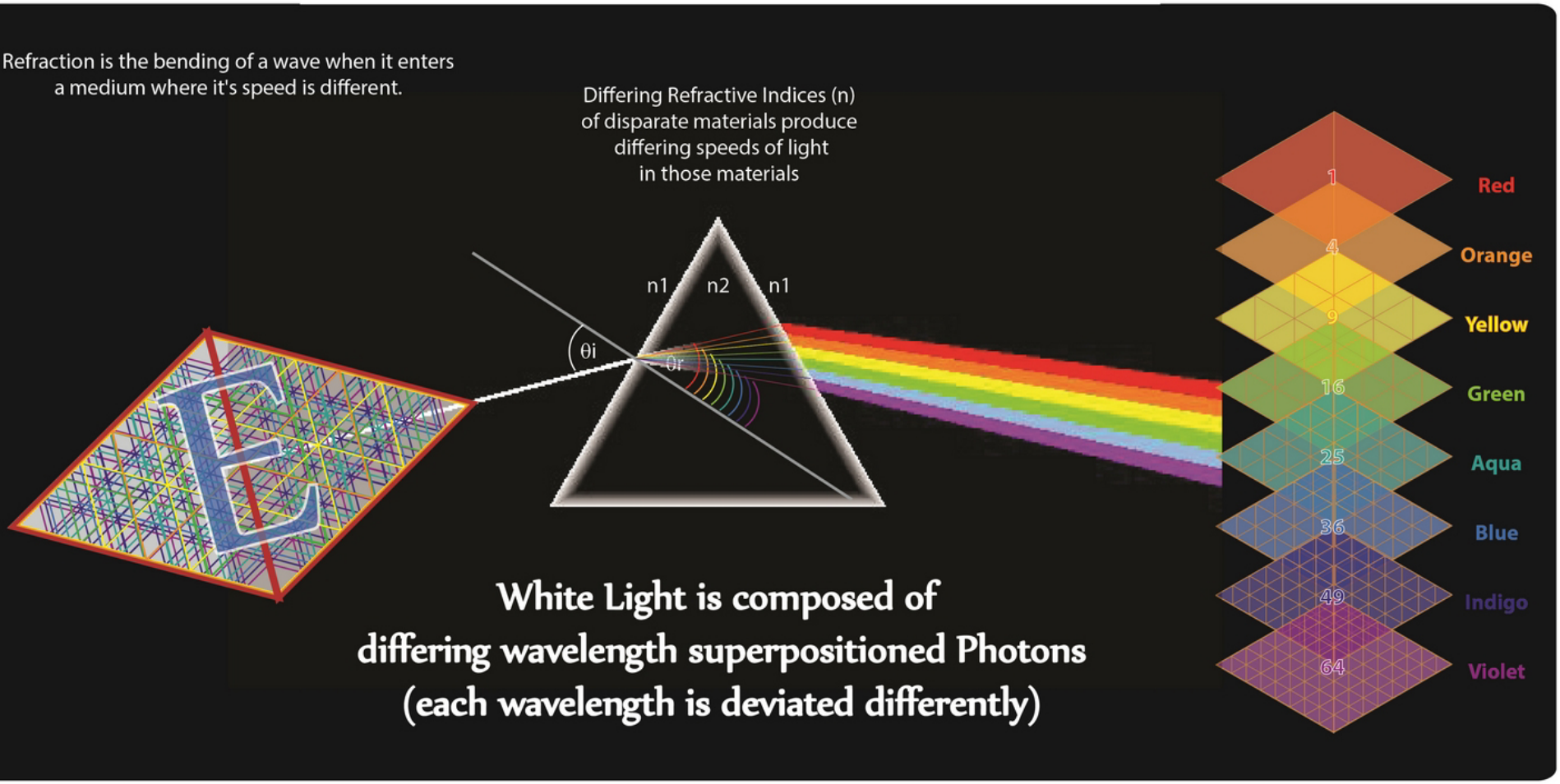
The refraction of light when it passes from a fast medium to a slow medium bends the light ray toward the normal to the boundary between the two media.

The amount of bending depends on the indices of refraction of the two media and is described quantitatively by Snell's Law.

Split light can be recombined

Refraction is the bending of a wave when it enters a medium where it's speed is different.

Differing Refractive Indices (n) of disparate materials produce differing speeds of light in those materials



White Light is composed of differing wavelength superpositioned Photons (each wavelength is deviated differently)

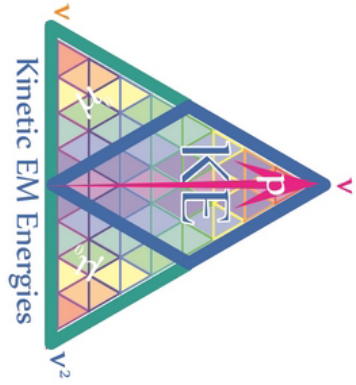
Quantum Tunnelling

Particles attempting to travel between potential barriers can be compared to a ball trying to roll over a hill; quantum mechanics and classical mechanics differ in their treatment of this scenario.

Classical mechanics predicts that particles that do not have enough energy to classically surmount a barrier will not be able to reach the other side. Thus, a ball without sufficient energy to surmount the hill would roll back down.

Or, lacking the energy to penetrate a wall, it would bounce back (reflection) or in the extreme case, bury itself inside the wall (absorption).

In quantum mechanics, these particles can, with a very small probability, tunnel to the other side, thus crossing the barrier. Here, the ball could, in a sense, borrow energy from its surroundings to tunnel through the wall or roll over the hill, paying it back by making the reflected electrons more energetic than they otherwise would have been.

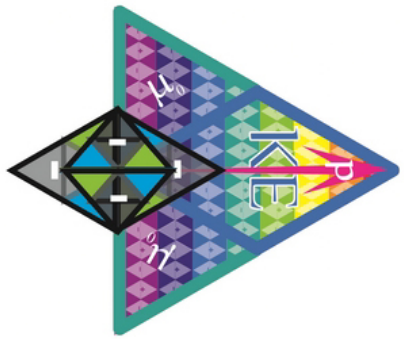


A quantum magician's slight of hand trick where the first electron is swapped another

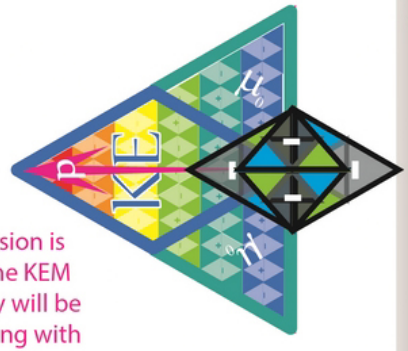
All electrons are IDENTICAL

It is physically impossible to identify a particular electron and track it

even using spin orientations only eliminates half of the total electrons in the barrier



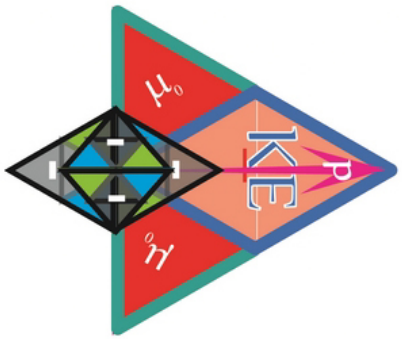
Reflection of Particle



If the collision is inelastic the KEM field energy will be reduced along with the particle's velocity

Absorption of Particle

If the electron is captured by an atom its KEM energy will continue to propagate until it is absorbed or makes its way out through re-emission



KEM field 'tunnels' out

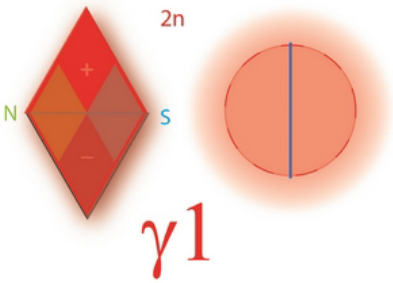
Removal of all electrons but the tracked one is impractical as it would result in an attractive coloumbic force that would trap the electron in the barrier

But if done could result in the possibility of measuring the KEM wave energy arriving at the opposite side of the electron's impact

A more likely explanation would be that the original electron was absorbed by the barrier and the KEM field propagated through the barrier along its original direction of momentum, only to reach the other edge of the barrier 'and accelerate any weakly bound electron (that was available) away from the barrier

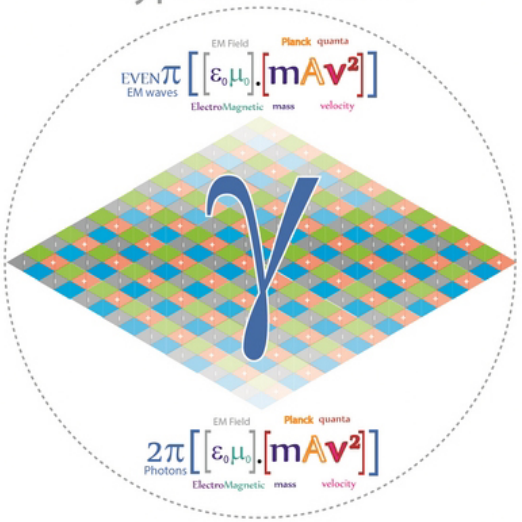
Quantum 'tunnelling' is reduced to most probably being the result of an electron's KEM wave propagating through the barrier not the electron itself

Ball Lightning

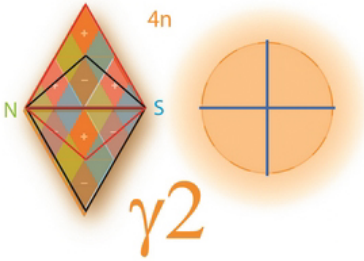


Descriptions of ball lightning vary wildly. It has been described as moving up and down, sideways or in unpredictable trajectories, hovering and moving with or against the wind; attracted to, unaffected by, or repelled from buildings, people, cars and other objects.

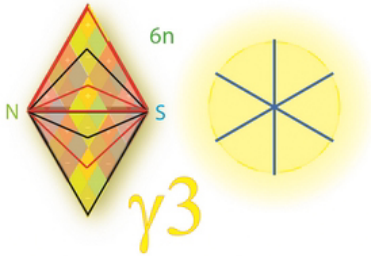
Typical EM wave

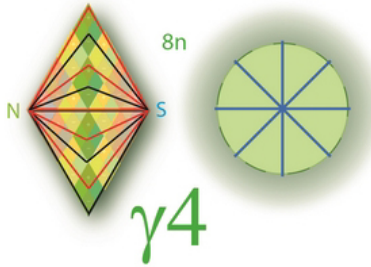


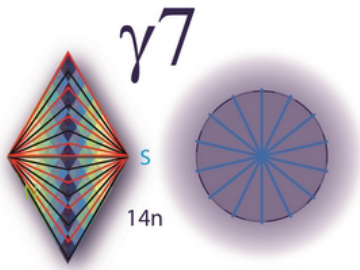
The EM energies in the 'ball of light' will be self-sustaining until interaction with Matter occurs

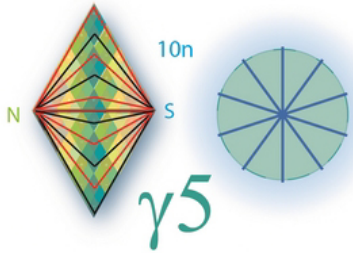


An alternative geometry for Photons and EM waves exists



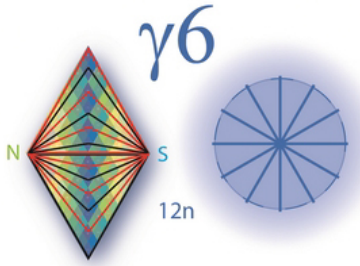






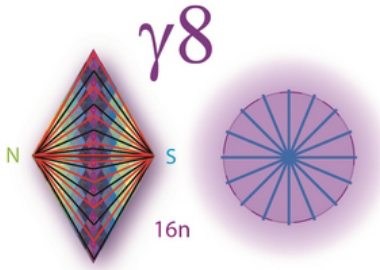
Ball lightning has been described as transparent, translucent, multicolored, evenly lit, radiating flames, filaments or sparks, with shapes that vary between spheres, ovals, tear-drops, rods, or disks

Any interaction with the 'ball' of EM energies would result in a explosive discharge of the ball's energies



Nikola Tesla was reportedly able to artificially produce 1.5" (3.8 cm) balls using spark gap technologies

This geometry provides a strong Magnetic moment and divergent E fields [similar to a bar magnet without the Matter] creating a "Ball' of light with varying EM energies that is sensitive to external M fields

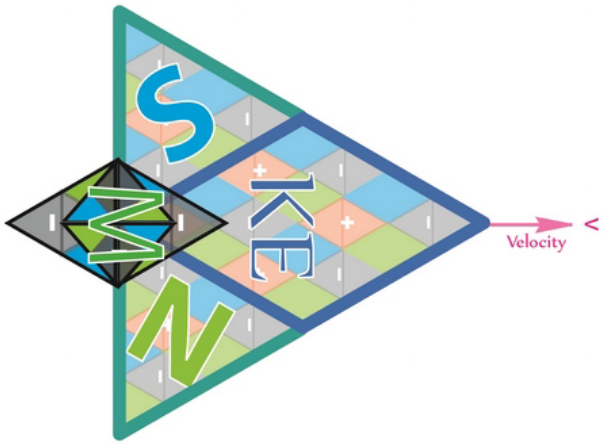


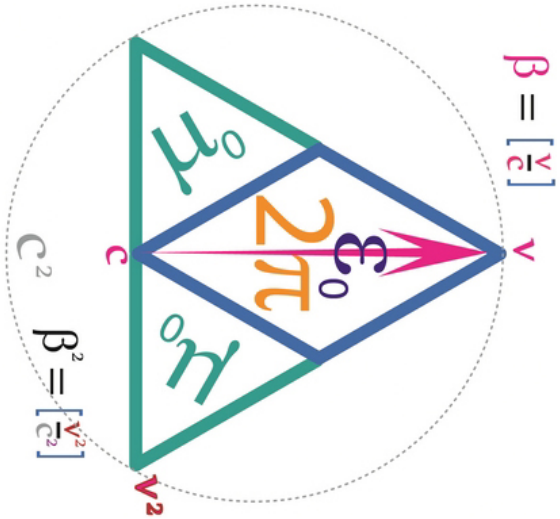
Relativistic Kinetic Energy

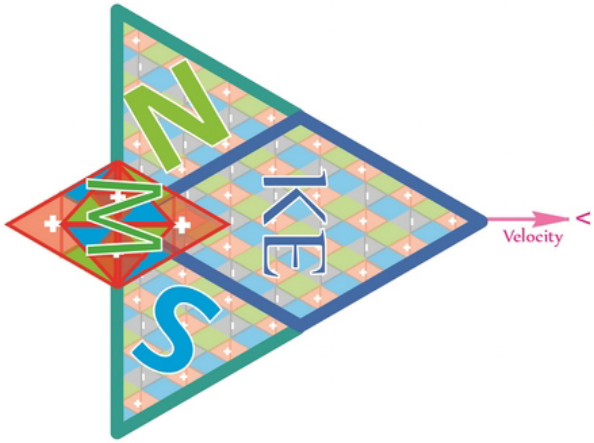
The Relativistic Kinetic Energy of a Moving system
follows Tetryonic EM mass-Energy geometries
and is subject to Lorentz corrections

$$KE = \frac{1}{2}Mv^2$$

$$p^2 = E = mv^2$$





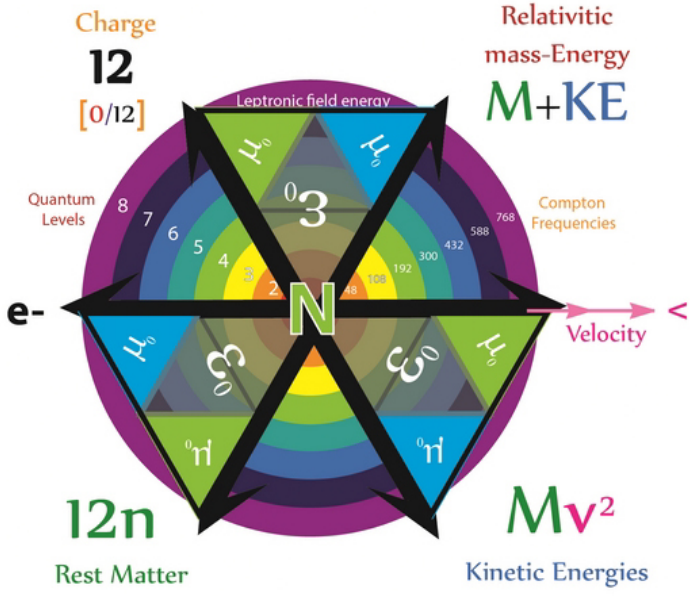


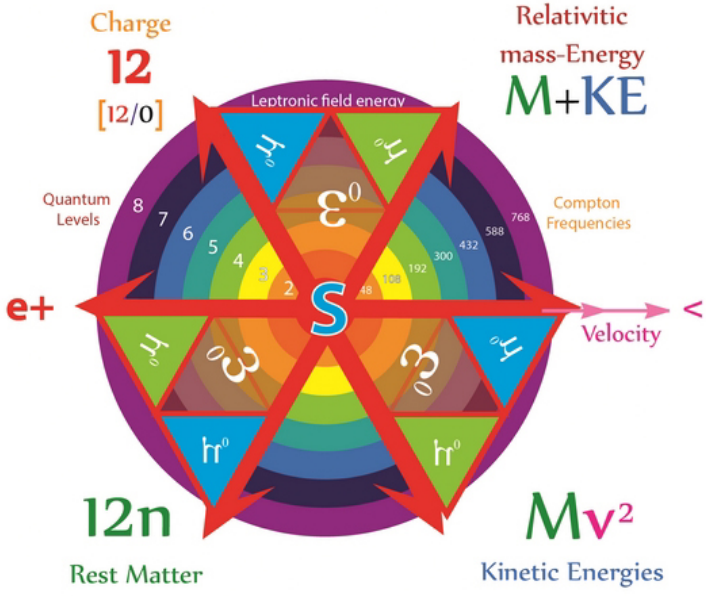
Lorentz contractions only apply to the KEM fields of Matter in motion

The Kinetic Energy of a particle in motion
can also be expressed in terms
of a moving system's momentum

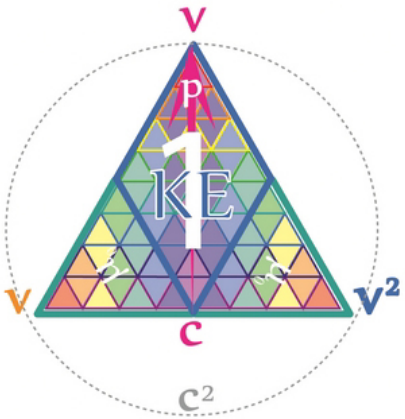
$$\frac{p^2}{2m} = KE = \frac{1}{2}Mv^2$$

or equally as 1/2 the total
relativistic EM mass-Energies
minus the invariant rest Matter





Lorentz Corrections



The Electric Permittivity and Magnetic Permeability of all EM energy Fields

$$\varepsilon_0\mu_0 = \frac{1}{c^2}$$

The poor definitions of EM mass & Matter has led to the Incorrect application of Lorentz corrections to Matter

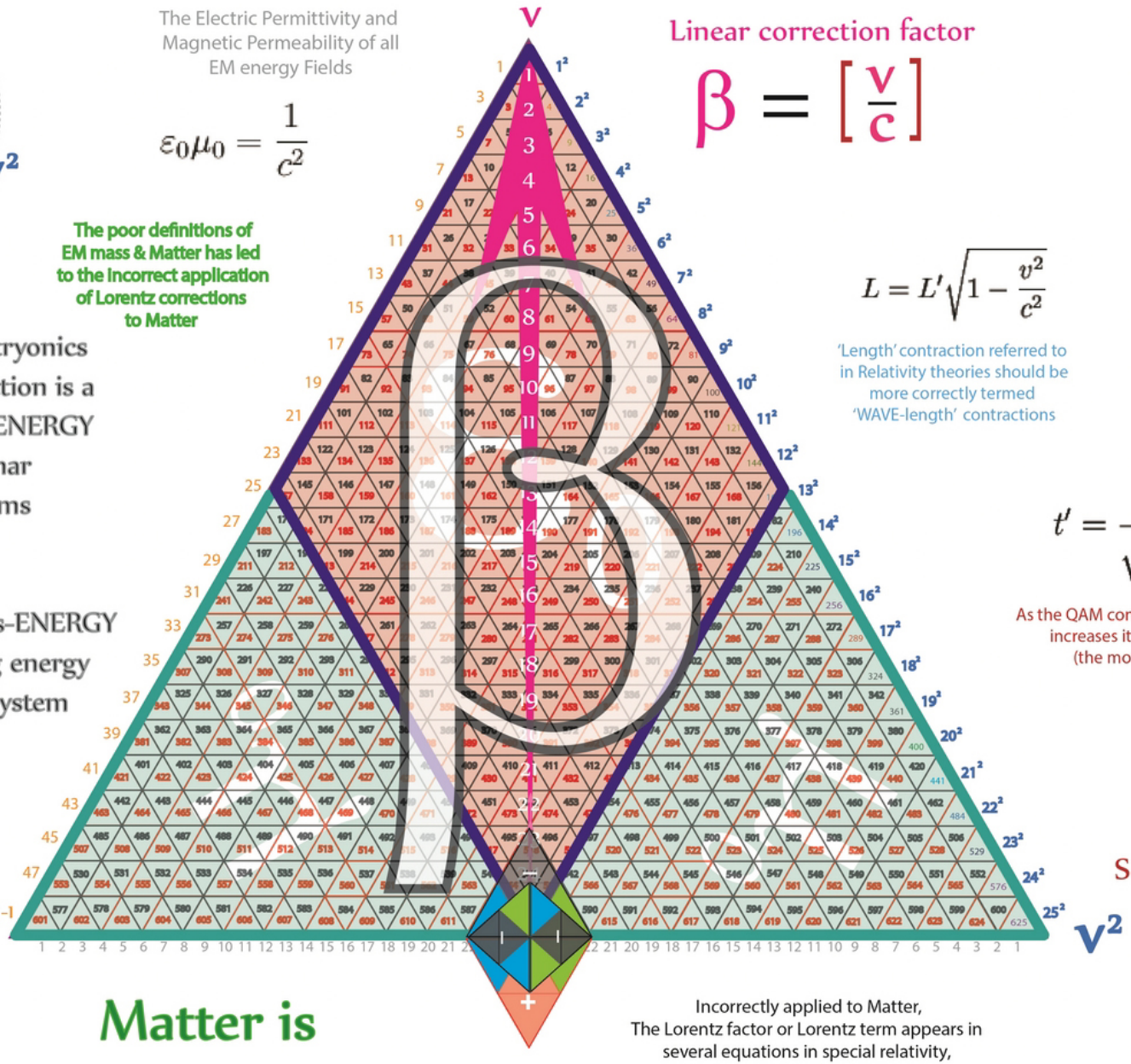
Applying the geometry of Tetryonics we see that the Lorentz correction is a reflection of the [K]EM mass-ENERGY momenta density of planar spatial co-ordinate systems [c²]

Producing differing [K]EM mass-ENERGY properties due to the differing energy densities contained in any system under measurement

$$\sqrt{1-\left(\frac{v}{c}\right)^2}$$

All EM mass-Energy geometries are v^2 equilateral geometries per c^2 radial time

$$\sqrt{1-\beta^2}$$



Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$

$$L = L'\sqrt{1-\frac{v^2}{c^2}}$$

'Length' contraction referred to in Relativity theories should be more correctly termed 'WAVE-length' contractions

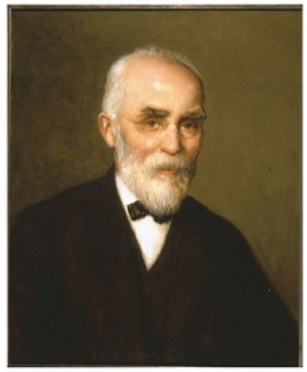
$$t' = \frac{t}{\sqrt{1-\frac{v^2}{c^2}}}$$

As the QAM content of c^2 geometries increases it acts to slow 'time' (the motion of energy)

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

Scalar correction factor

Hendrik Lorentz



(18 July 1853 – 4 February 1928)

Matter is Lorentz invariant

Incorrectly applied to Matter, The Lorentz factor or Lorentz term appears in several equations in special relativity,

including time dilation, length contraction, and the relativistic mass formula.

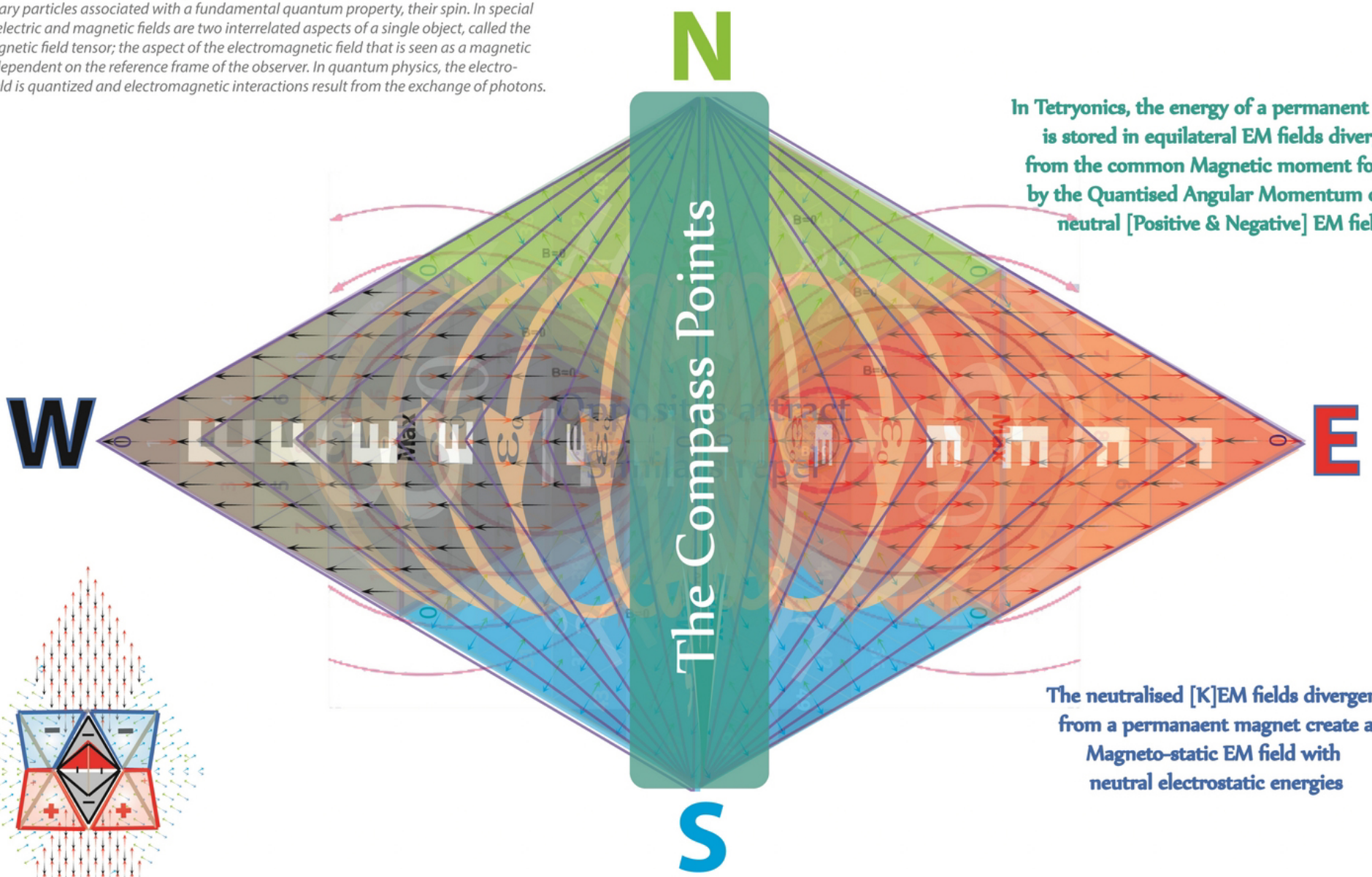
It gets its name from its earliest appearance in Lorentzian electrodynamics

Lorentz contractions apply to [K]EM waveforms only

The Energy of a Magnet

Magnetic fields are produced by moving electric charges and the intrinsic magnetic moments of elementary particles associated with a fundamental quantum property, their spin. In special relativity, electric and magnetic fields are two interrelated aspects of a single object, called the electromagnetic field tensor; the aspect of the electromagnetic field that is seen as a magnetic field is dependent on the reference frame of the observer. In quantum physics, the electro-magnetic field is quantized and electromagnetic interactions result from the exchange of photons.

Classically, the energy of a permanent magnet 'circulates in endless loops' from North to South in 3 dimensions around the magnetic moment



In Tetryonics, the energy of a permanent magnet is stored in equilateral EM fields diverging from the common Magnetic moment formed by the Quantised Angular Momentum of the neutral [Positive & Negative] EM fields

The neutralised [K]EM fields divergent from a permanaent magnet create a Magneto-static EM field with neutral electrostatic energies

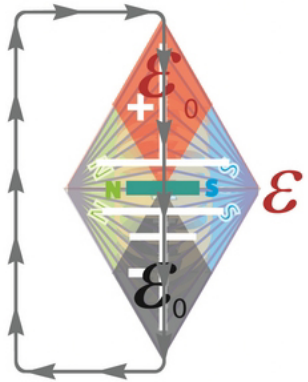
Energy can be removed by placing a conducting loop between any Positive and Negative quanta the EM field thus creating a potential difference & electro-motive force

Electro-Magnetic circuits

The is no such entity as a purely Magnetic field
[all fields are Electro-Magnetic in their geometric foundations]

Any two seperated opposite charge Bosons that are connected in a conductive circuit will produce an emf

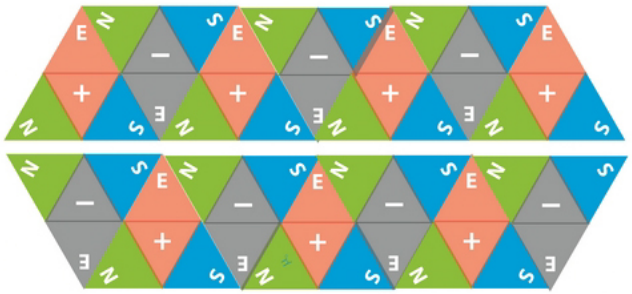
All permanent magnets have stored electrostatic [neutralised] potentials



A changing Electric field produces a changing Magnetic field

A changing Magnetic field produces a changing Electric field

emf



BOSONS are transverse EM waves [Charge carriers]

The Electric and Magnetic field geometries are 90 degrees out of phase with each other

$$\mathcal{E} = -\frac{d\Phi_B}{dt},$$

The equilateral geometry of ALL EM fields can produce a time varying emfs

PHOTONS are longitudinal EM waves [neutral charge carriers]

Permanent Magnetic fields

All permanent magnets are Electro-Magnetic fields comprised of

Transverse Bosons and Longitudinal Photons

It is the charged [Bosonic] field geometries that produce the emf required to move stationary charges within a conductor

The Photonic field geometry of all Magnets produces their strong Magnetic dipoles and neutralised Electric fields that are characteristics of Magnets

c

p

Magnetic fields can display Bosonic and Photonic field geometries

Bosons and Photons are disparate, alternating EM waveforms

d

c

Electric charge fields

Magnetic dipoles

Separated charges produce an Electromotive Force

Neutral Electric fields

Neutral Magnetic fields

combining to form neutralised Electric fields

In current theory:
We see two observers both moving, approaching each other.

Observer 1 says:

Conductor Frame of Reference
(Moving Magnet)

The conductive loop is stationary and the magnet is moving toward it.
Teh electrons in the loop are stationary and have no magnetic moments
There is a magnetic field, but it can't produce any force on
the electrons since they are stationary within the loop.

Instead, the magnetic field is changing, growing stronger as
the magnet gets closer, and this changing magnetic field
produces an electric field which causes forces on the electrons,
and drives them around the loop and produces the current in the galvanometer.

Observer 2 says:

Magnet Frame of Reference
(Moving Conductor)

The magnet is stationary and the loop is moving toward it.
The electrons in the loop, since they are moving with the loop,
generate their own magnetic moments and
feels a Lorentz force as a result of the external magnetic field [F = q v X B],
which drives them around the loop and produces the current in the galvanometer.

There is no electric field.

The accepted Conclusion:

Special Relativity

Electric and magnetic fields are not invariant entities themselves, but are aspects of a single entity, the electromagnetic field, which manifests itself differently to different moving observers

Tetryonic theory:

The Electric and Magnetic fields are discrete, invariant geometries resulting from the 'inductive' loop properties of Planck energy fluxes resulting from motion, which in turn combine to form an ElectroMagnetic field, comprised of (Charged Bosonic and Neutral Photonic fields) dependent on the direction of motion of a conductor through the ElectroMagnetic field.

An emf can be produced when a conductor connects any two opposite voltage potentials resulting in imbalance

The Electromotive Force

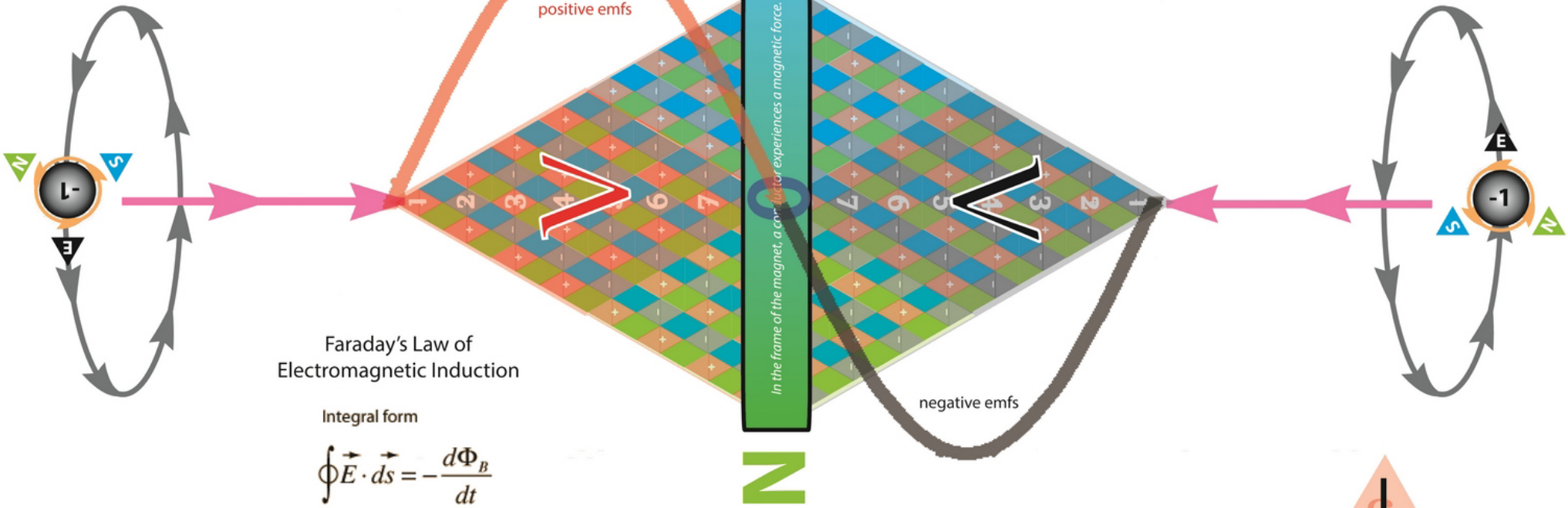
The electromotive force, [or emf] or electromotance is "that which tends to cause a current (electrons and ions) to flow in a conductor.

Even neutral EM fields [Magnets] are comprised of Bosons containing discrete Energy momenta fields, which in turn are capable of accelerating charged particles

Opposite voltage emfs create opposite forces on the same charged particles

Opposite charged particles experience opposite forces due to emf

In the frame of a conductor moving relative to the magnet, the conductor experiences an emf due to an electric field.



Faraday's Law of Electromagnetic Induction

Integral form

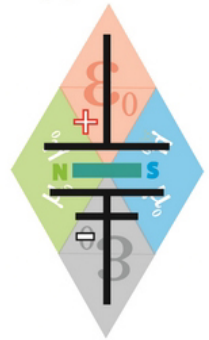
$$\oint \vec{E} \cdot \vec{ds} = -\frac{d\Phi_B}{dt}$$

Differential form

$$\nabla \times E = -\frac{\partial B}{\partial t}$$

All ElectroMagnetic fields have distinct equilateral electric and magnetic field geometries that produce velocity related sinusodal waveforms

$$\mathcal{E} = -\frac{d\Phi_B}{dt},$$



The Electromotive Force

Lenz's law:

"The emf induced in an electric circuit always acts in such a direction that the current it drives around the circuit opposes the change in magnetic flux which produces the emf."

"A source of emf can be thought of as a kind of charge pump that acts to move a charge from a point of low potential through its interior to a point of high potential. …

The emf of the source is defined as the work done per charge dq: = dW/dq."

A Magnet is really a neutralised [electrostatic] emf potential difference 'battery' [with two equalised potential differences creating an orthagonal Magnetic moment]

The Moving Magnet problem

The moving magnet and conductor problem is a famous thought experiment, originating in the 19th century, and provides the intersection of classical electromagnetism and special relativity.

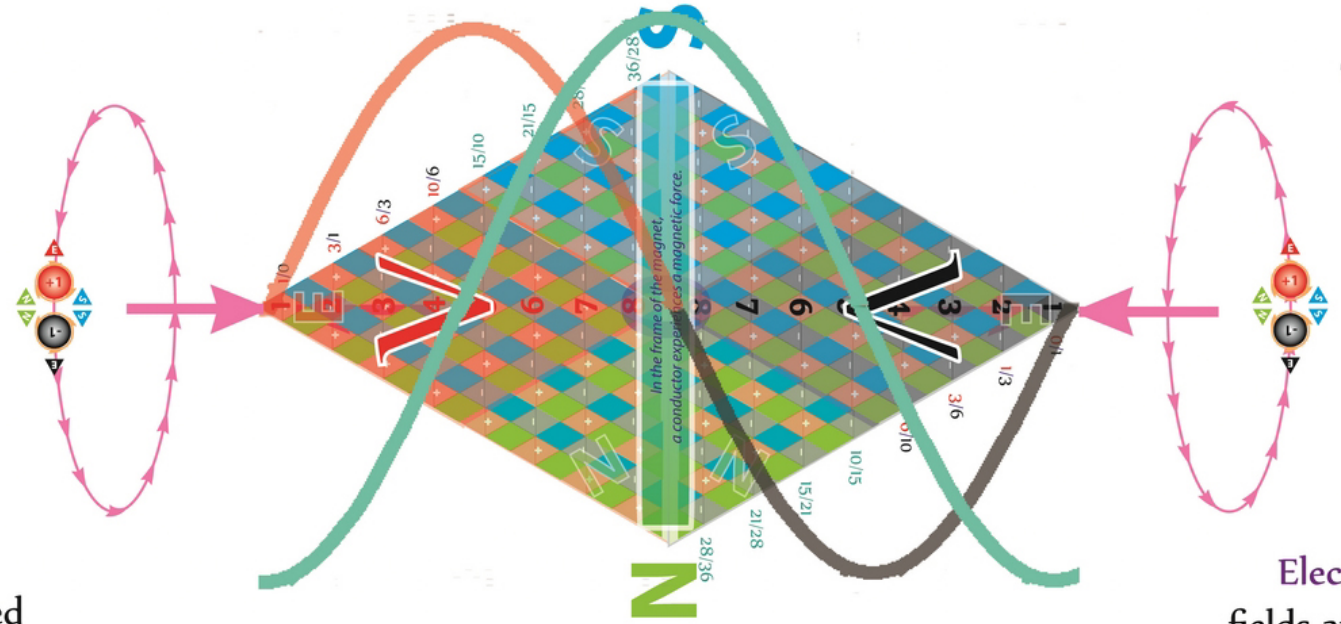
An electromotive Force results from the motion of a conductor relative to a magnetic field

A Magnet is really an electrostatic emf potential difference 'battery' [with two equalised potential differences creating an orthagonal Magnetic moment]

The moving magnet and conductor problem, along with Michelson-Morley experiment, formed the basis of Einstein's theory of relativity.

Special Relativity explanation

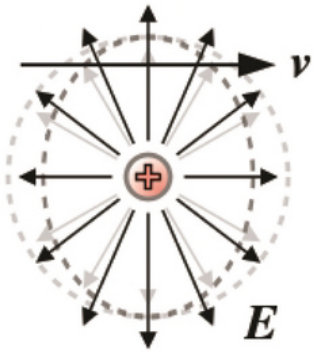
In the frame of a conductor moving relative to the magnet, the conductor experiences a force due to an electric field.



Tetryonic Geometry explanation

The conductor moves through differing Electric and Magnetic geometries experiencing sinuodal E/M waveforms that are 90 degrees out of phase

A Magnetic field is an Electric field viewed in a differing inertial frame



$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

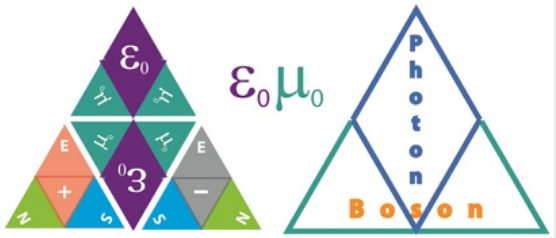
Electric force — Magnetic force

If a conductor moves with a constant velocity through the field of a stationary magnet, eddy currents will be produced due to a magnetic force on the electrons in the conductor

In the rest frame of the conductor, on the other hand, the magnet will be moving and the conductor stationary.

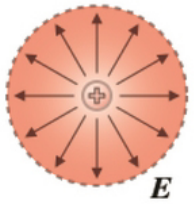
Classical electromagnetic theory predicts that precisely the same microscopic eddy currents will be produced, but they will be due to an electric force

Electric and Magnetic fields are discrete geometric properties of Energy



All EM fields are comprised of Bosons and Photons which contain and produce all Electric and Magnetic forces

Einstein's Error (of perception)



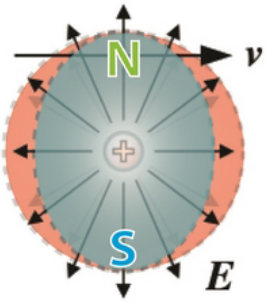
v=0

In its rest frame the electric field of a positive point charge has the same strength in all directions and diverges away from the charge.

Electric fields are distorted due to Relativistic speed effects to create Magnetic fields
The faster the velocity the greater the Magnetic field
At rest the Magnetic field becomes an Electric field

What led me more or less directly to the special theory of relativity was the conviction that the electromotive force acting on a body in motion in a magnetic field was nothing else but an electric field

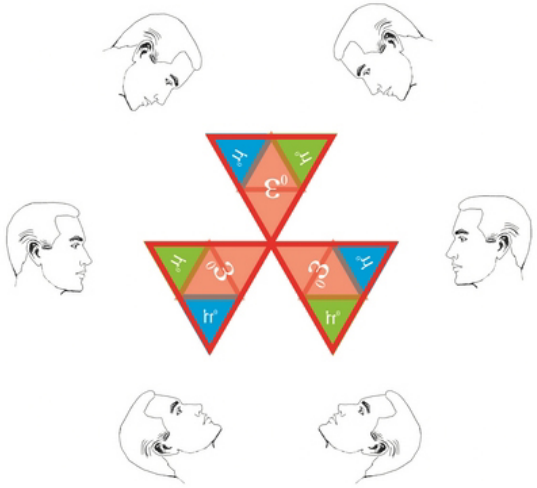
Albert Einstein 1953



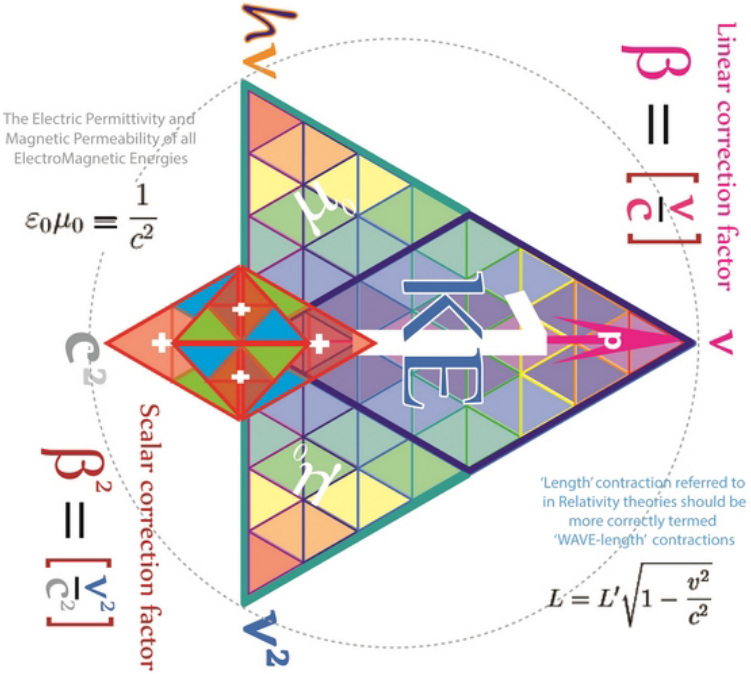
v=.6c

The SR theoretical model of relativistic charged body distortions as the basis for the production of Magnetic fields from moving Charges is incorrect

Stationary Charges have Electric Fields and Neutralised Magnetic fields



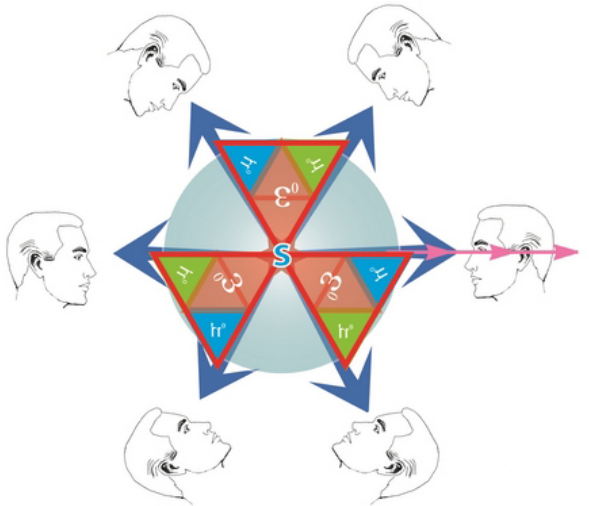
Leptons are 12 charge EM mass-Energy standing waves



Lorentz velocity dependent factors relate to Kinetic ElectroMagnetic waves only

It is the Kinetic EM mass-Energies that produces a Magnetic moment due to the motion of ElectroStatic Matter (12 + loop inductive geometries)

Moving Charges have Electric fields and Magnetic Moments



Moving Leptons are 12 charge standing waves with Kinetic EM mass-Energies

Tetryonic relativistic motion

The [K]EM energy content of a particle in motion is velocity dependent
its rest Matter & Charge are velocity invariant

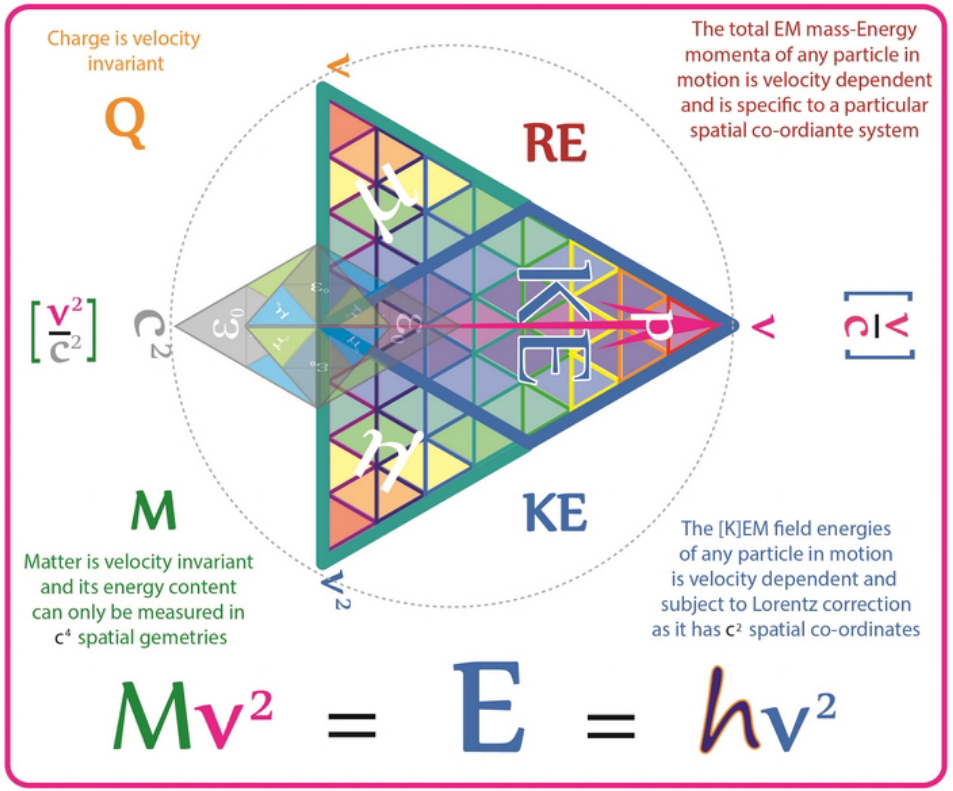
In a frame in which the particle is at rest, we see only an electric field,

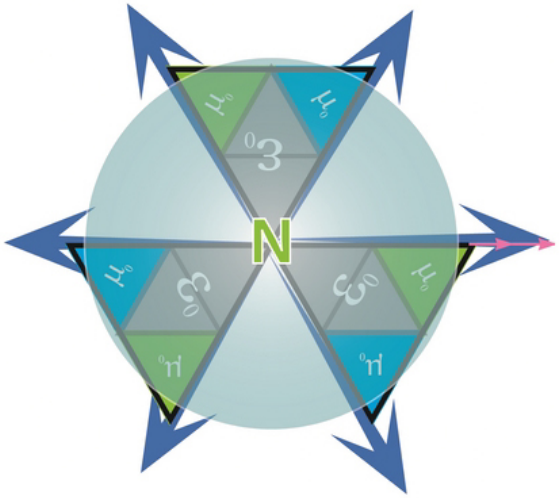
We know that the fields due to a charged particle appear different in different inertial frames:

In a frame in which the particle is moving, we also see a magnetic field.

rest Matter

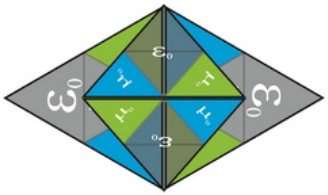
All Magnetic dipoles are neutralised



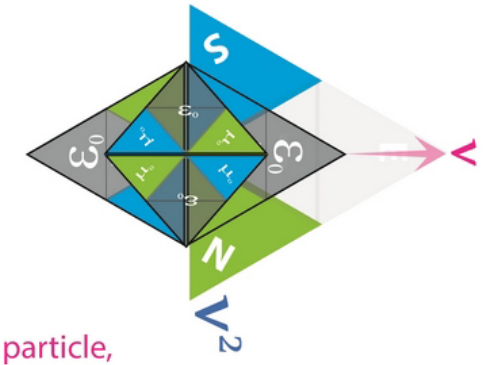


rest Matter+KEM

[K]EM fields produce a magnetic moment



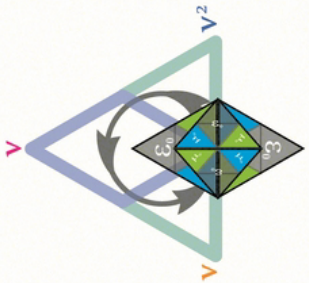
Tetryonics has revealed that the Kinetic Electro-Magnetic [KEM] field of a particle in motion has a distinct geometric identity of its own rather than being the relativistic distortion of a charged EM particle



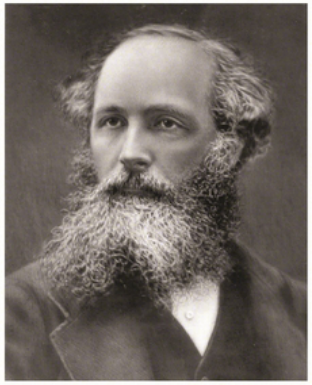
[Action at a Distance]
The problem of simultanity is avoided because a second particle responds not directly to the first particle, but rather to the first particle's velocity related [K]EM field generated by its velocity at its own position.

Quantum level

KEM field

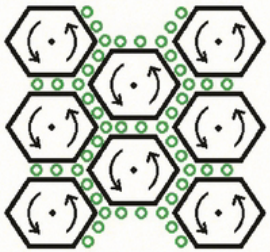


James Clerk Maxwell



(13 June 1831 – 5 November 1879)

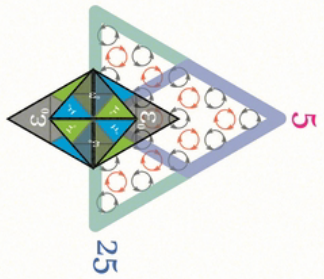
All quantum charge arrangements in energy, mass and EM forces can be viewed as an arrangement of 'quantum idler wheels'

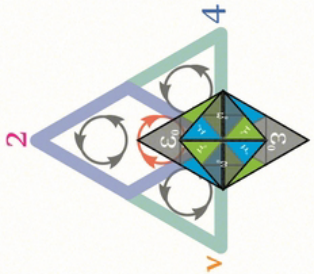


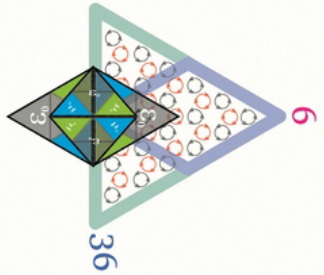
"As early as 1857 Maxwell began to develop the idea of orienting molecular vortices along magnetic field lines, culminating in the publication of his paper 'On physical lines of force'… He posited a honeycomb of vortices in which each vortex cell was separated from its neighbour by a layer of spherical particles, revolving in the opposite direction to the vortices. These 'idler wheel' particles communicated the rotatory velocity of the vortices from one part of the field to another. In this ether model, the most famous image in nineteenth-century physics, the analogy provides mechanical correlates for electromagnetic quantities. The angular velocity of the vortices corresponds to the magnetic field intensity, and the translational flow of the idle wheel particles to the flow of an electric current; the field equations are based on the rotation of molecular vortices in the ether. He emphasized that while the theory was mechanically conceivable, the model itself was provisional and temporary, even awkward, hardly 'a model of connexion existing in nature' (Niven, 1.486), an argument that has generated much philosophical discussion about the role of models in physics"

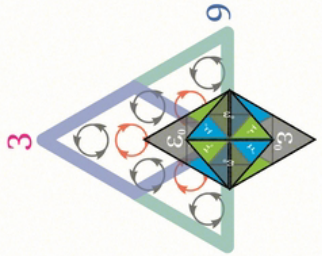
KEM field

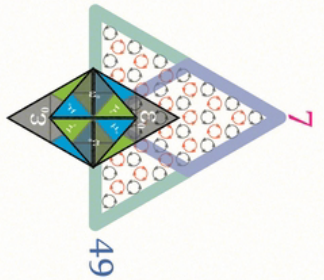
Quantum level

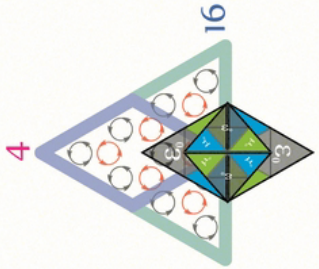


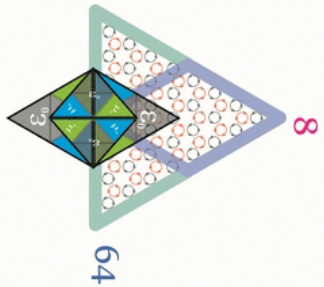












Equating Equilateral geometries to Quantised Angular Momentum reveals a classical mechanical model closely resembling Maxwell's hypothesised idler wheels

Virtual Particles

In physics, a virtual particle is a particle that exists for a limited time and space, it has become a commonplace mechanism in current Physical theories to provide a basis for the Force interactions between particles

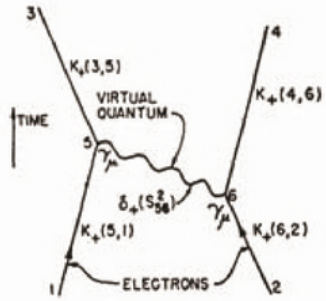
$$mv^2 = E = pv$$

The energy and momentum of a virtual particle are uncertain according to the uncertainty principle.

$$m^2v^4 = E^2 = p^4$$

The degree of uncertainty of each is inversely proportional to time duration (for energy) or to position span (for momentum).

Original Feyman diagram illustrating the exchange of a quantum between 2 electrons



$m^2c^4 = E^2 - p^2c^2$

is in-correct for superpositioned 2D KEM fields
the real geometry is illustrated below:

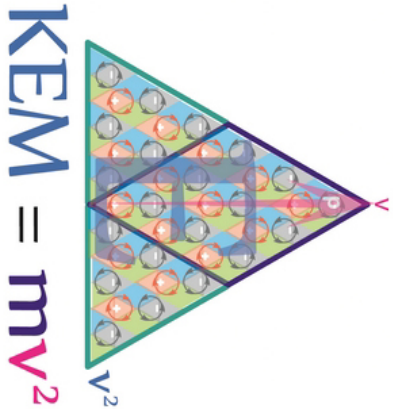
Bohr understood that if you are going to try to be mechanical, you have to show some convincing mechanics.

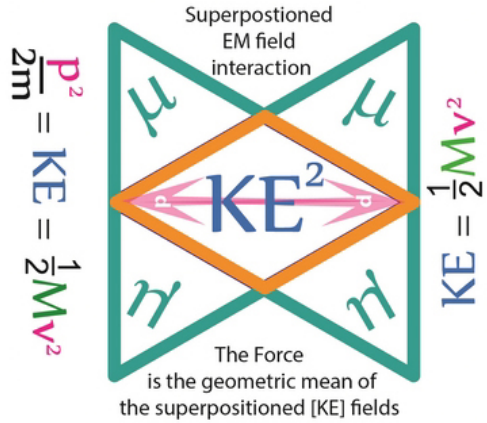
If you can't show some convincing mechanics, you might as well dodge all mechanics from the beginning, staying with the math.

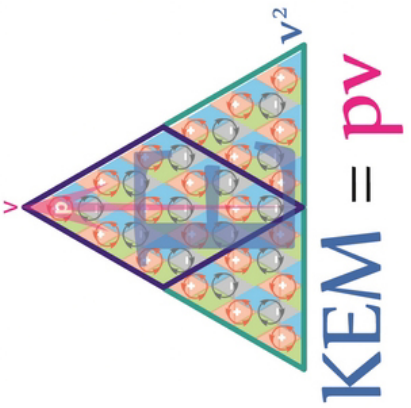
He had learned this from Maxwell, who had done the same thing 60 years earlier.

In the 1860's, Maxwell had tried to create vortices to explain the field mechanics, but, finding himself under heavy fire from Kelvin and others, he decided to give it up and go to other mathematical alternatives like quaternions instead.

$$\frac{m^2v^4}{2} = KE^2 = \frac{p^2v^2}{2}$$







The geometry of Tetryonics clears up this issue once and for all, virutal particles do NOT exist. The Force interaction between Matter in motion is mediated by the equilateral geometries of [K]EM mass-ENERGY momenta that exist throughout etheric Space-time

The Hidden Constant

$$kg\ m\ \frac{m^2}{s}\ A = h\ kg\frac{m^2}{s}$$

Quantised Angular Momentum has an Equilateral geometry

α

The Alpha Constant

Tetryonics has revealed
the physical relationships between
Planck's constant, Charge and Permittivity
showing quantised angular momentum to be
the geometry behind the 'hidden' constant alpha

6.62943244 e-34 J

EM Field — Planck quanta

$1.33570456 \times 10^{-20}$ C

$$1\pi\ [[\varepsilon_0\mu_0].[mAv^2]]$$

Charge — ElectroMagnetic — mass — velocity

7.376238376 e-51 kg

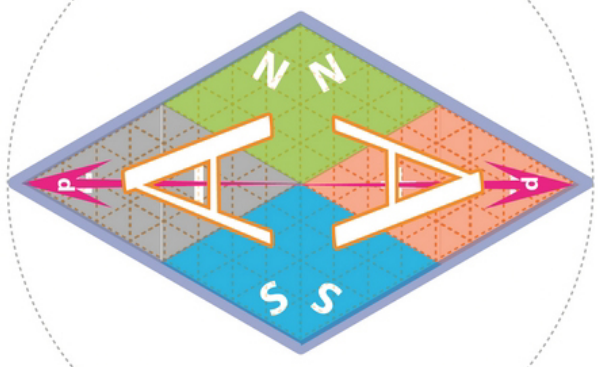
A

Quantised Angular Momentum

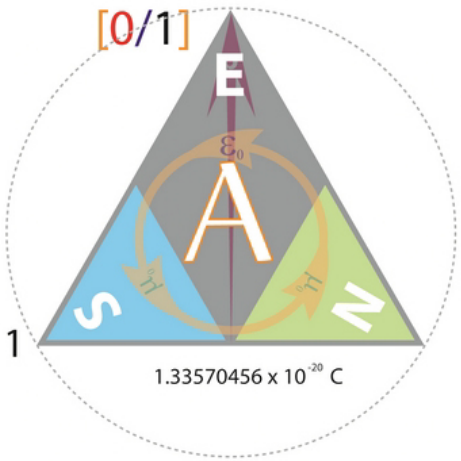
It is the geometric coupling constant
between Magnetic and Electrical energies
that acts as a scaling constant between
Kinetic and Potential quantum energies

It is the source of Quantum Charges and
all EM mass-Energy momentum - inertia

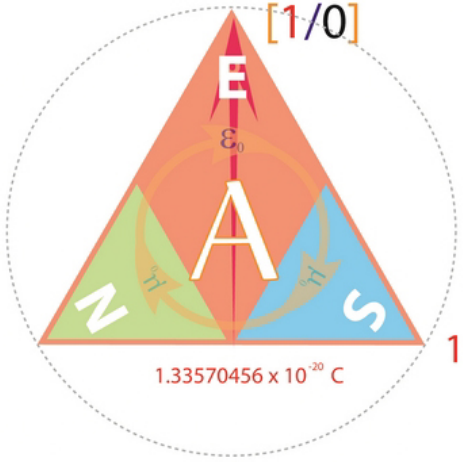
Classically modelled as a 'rotational' vector Quantised
Angular Momentum is in fact an Equilateral geometry



Photons are dual equilateral geometries creating a
neutral charge with two opposed coupling constants



Quantised Angular Momenta creates Charged EM Geometries



Alpha coupling Constant

A

In physics, the fine-structure constant
is a fundamental physical constant,
namely the coupling constant characterizing
the strength of the electromagnetic interaction.

The numerical value of α is the same
in all systems of units, because α is a
dimensionless quantity.

α

There is a most profound and beautiful question associated with the observed coupling constant,
e the amplitude for a real electron to emit or absorb a real photon.
It is a simple number that has been experimentally determined to be close to 0.08542455.

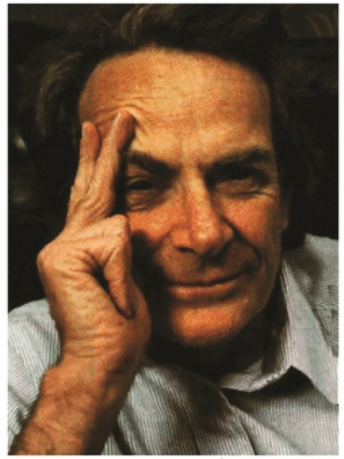
It has been a mystery ever since it was discovered more than fifty years ago,
and all good theoretical physicists put this number up on their wall and worry about it.

Immediately you would like to know where this number for a coupling comes from:
is it related to pi or perhaps to the base of natural logarithms? Nobody knows.
It's one of the greatest damn mysteries of physics: a magic number that comes to us with no understanding by man.

You might say the "hand of God" wrote that number, and "we don't know how He pushed his pencil."

We know what kind of a dance to do experimentally to measure this number very accurately,
but we don't know what kind of dance to do on the computer to make this number come out, without putting it in secretly

Richard Feynman

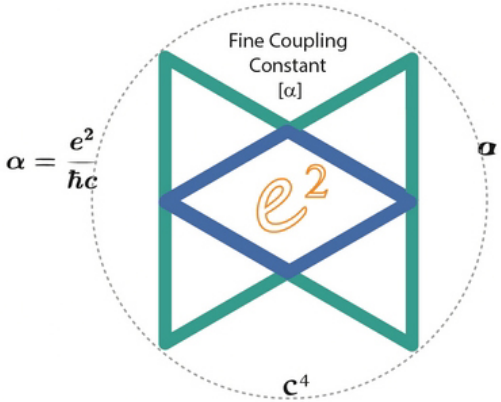


.0012

2π

.007539822

132.6291192 -1



$$\alpha = \frac{e^2}{\hbar c} \qquad \alpha = \frac{e^2}{\hbar c\, 4\pi\varepsilon_0}$$

$$= 7.297\,352\,5376(50) \times 10^{-3}$$

$$= \frac{1}{137.035\,999\,679(94)}.$$

**The ALPHA Constant is the scalar component of Force
resulting from the coupling of Quantised Angular Momenta in
Superpositioned EM fields that facilitates Force (quantised energy momenta)
exchanges, resulting in the familiar Laws of Attraction/Interaction**

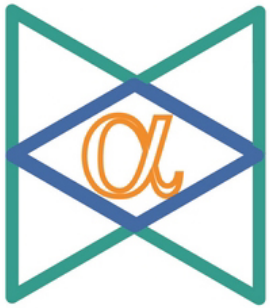
Superpositioned Fields

.0012 m²/s

A

QAM

A = 0.0012



α = 0.007539822

α

alpha

= 132.6291192^{-1}

Alpha coupling Constant

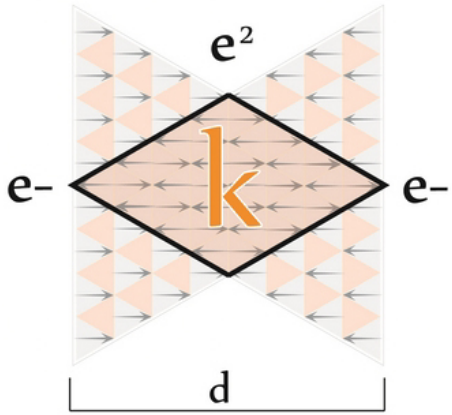
The Fine Structure Constant

$2\pi[QAM]_{.0012} = 0.007539822$

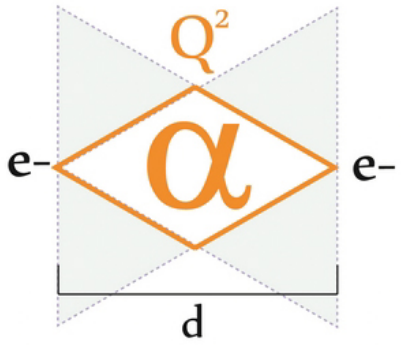
Arnold Sommerfeld introduced the fine-structure constant in 1916 it is a fundamental physical constant, namely the coupling constant characterizing the strength of the electromagnetic interaction.

$2\pi[QAM]^{-1}_{.00119997} = 132.6291192$

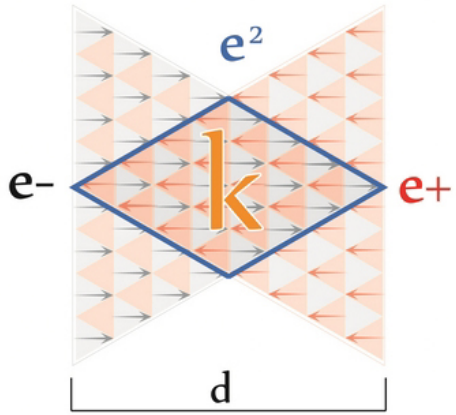
It is often refered to as the "coupling constant" or measure of the strength of the electromagnetic force that governs how electrically charged elementary particles interact e.g. electron, Matter and light (photons).



Similar Charges REPEL



Being a dimensionless quantity, it has constant numerical value in all systems of units that is derived from its geometry.



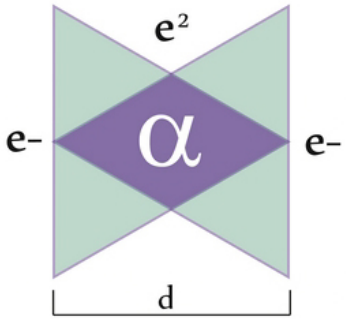
Opposite Charges ATTRACT

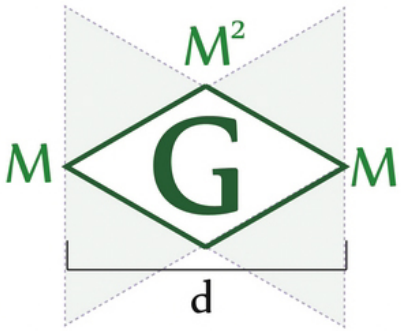
It can be accurately defined as a ratio resulting from two superpositioned charge E-field energies:

$$\alpha = .007539822$$

The alpha constant applies equally to the coupling of Electric and Gravitational superpositioned fields

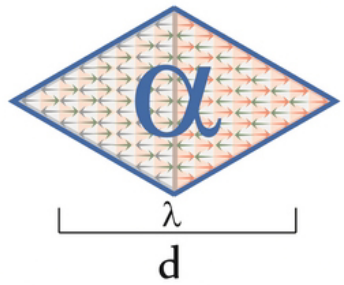
(i) the energy needed to overcome the electrostatic repulsion between two electrons separated by a distance of d, and





Gravitational Matter is always ATTRACTIVE

(ii) the energy of a single photon of wavelength $\lambda = 2\pi d$ (from a Tetryonic perspective, of quantised angular wavelength r = d)

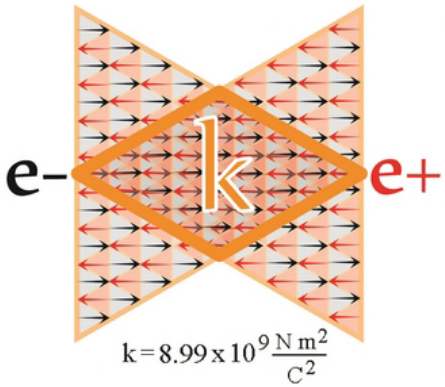


Coupling Constants

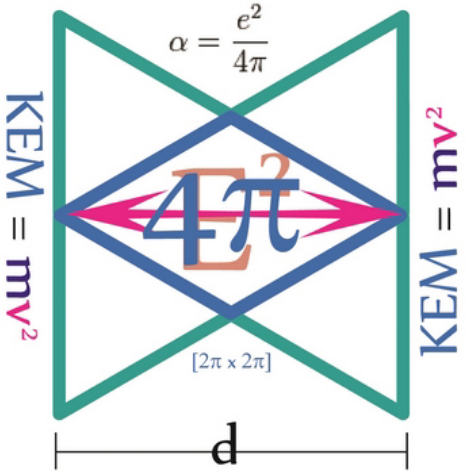
$$\frac{k\,Q_1\,Q_2}{r^2} = F$$

In physics, a coupling constant is a number
that determines the strength of an interaction
for superpositioned Electrical or Gravitational fields

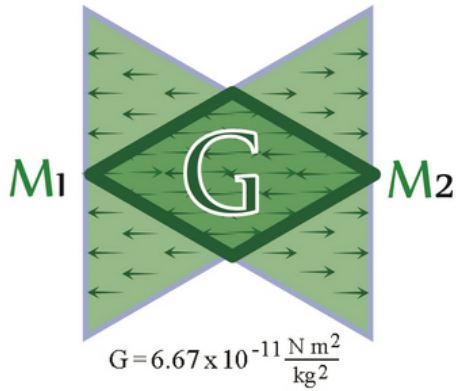
$$F = -G\,\frac{M_1\,M_2}{r^2}$$



All Charges posess
velocity proportional
[K]EM fields



All Matter posesss
velocity proportional
[G]EM fields



Coulomb's [k], Newton's [G] and the Fine structure constant [α]
are all reflections of the same coupling constant geometries differing only
by the strength of their respective superpositioned energy field densities

$$\beta = \left[\frac{v}{c}\right]$$

Linear coupling constant

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

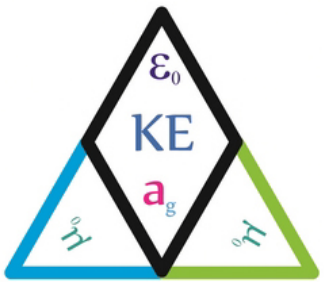
Scalar coupling constant

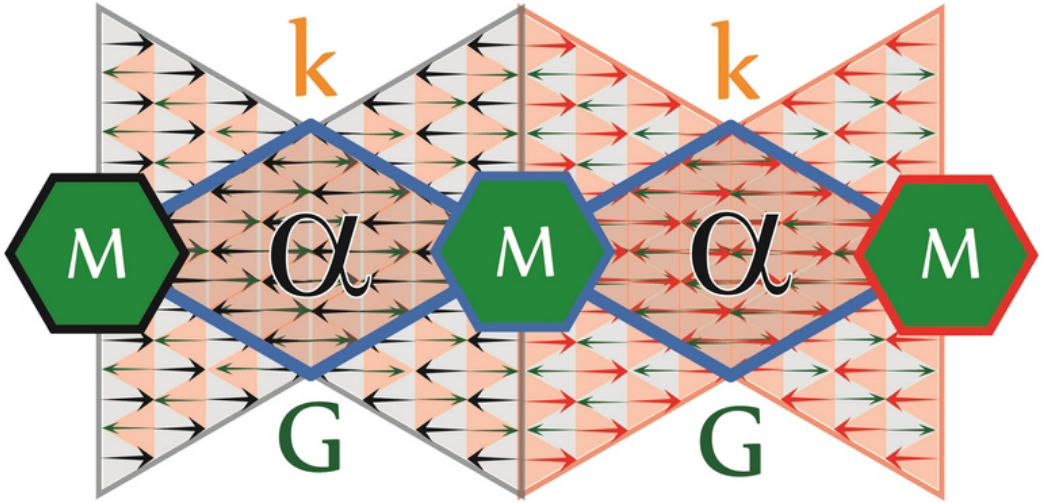
Coupling Constants
are dimensionless
numbers

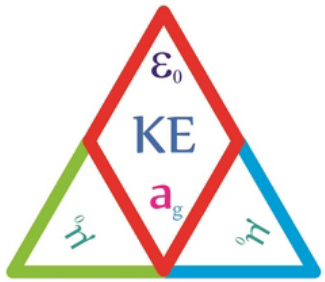
$$\frac{m}{s}\ \frac{s}{m}$$

They are reflective of the total
linear forces [QAM quanta]
per c^2 geometry

$$\frac{m^2}{s^2}\ \frac{s^2}{m^2}$$







Usually the Lagrangian or the Hamiltonian of a system can be separated into a kinetic part and an interaction part.
[For example, the electric charge of a particle is an Electrical coupling constant]

ElectroMagnetic Charge

[the universal coupling constant]

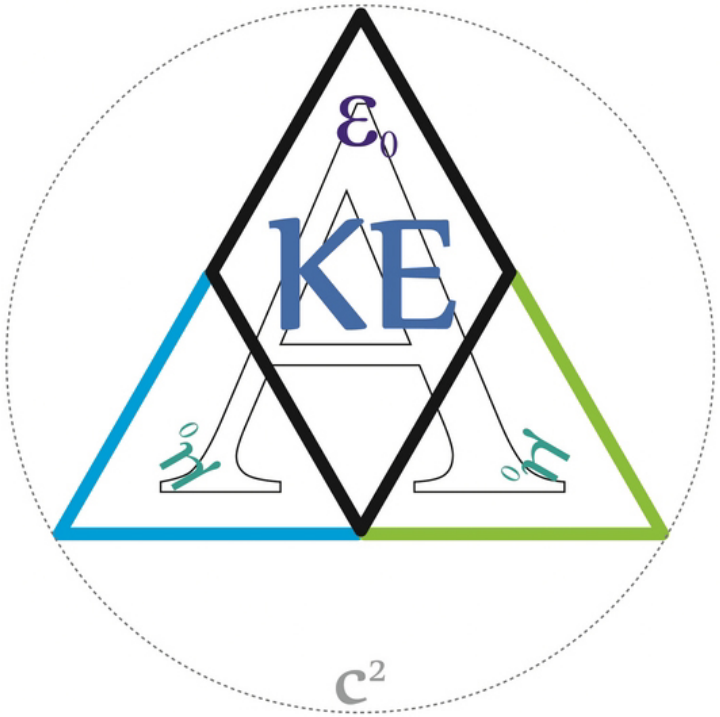
Electric charge is a physical property of matter that causes it to experience a force when near other electrically charged matter.
Electric charge comes in two types, called positive and negative

1.33518 e-20 C

$$Q$$

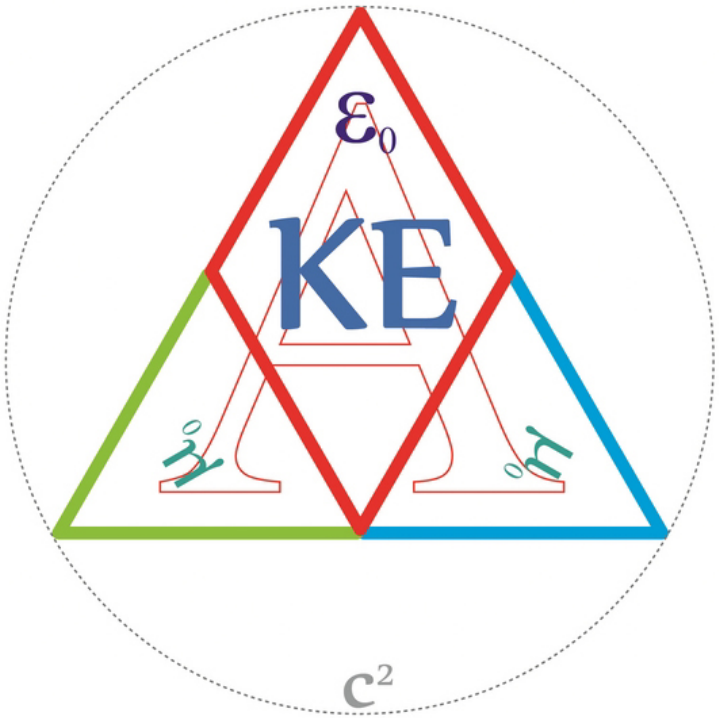
$$[v/v]$$

1.33518 e-20 C



ElectroMagnetic CHARGE is the foundation of quantum geometries

$$\frac{A}{c^2}$$



The electric charge is a fundamental conserved property of all subatomic particles, which determines their electromagnetic interaction.

Opposites ATTRACT

Electrically charged matter is influenced by, and produces, electromagnetic fields.

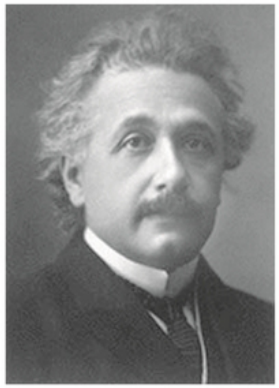
Similars REPEL

The interaction between a moving charge and an electromagnetic field is the source of the electromagnetic force, which is one of the four fundamental forces

Einstein–Podolsky–Rosen paradox

was a thought experiment that attempted to challenge the Copenhagen interpretation of Quantum physics

Albert Einstein



(14 March 1879 – 18 April 1955)

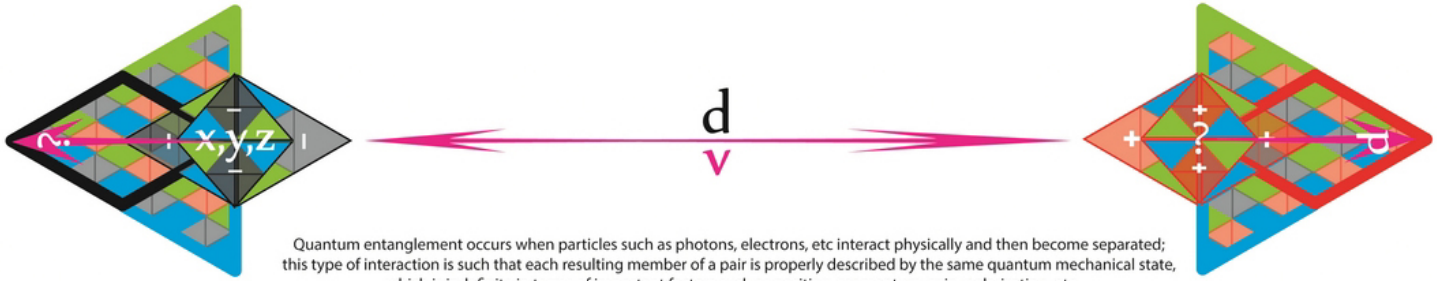
**The EPR paper shows that measuring one feature of a entangled system,
e.g., the momentum of one of the pair of particles,
will reveal the same feature of the other particle - thus providing a mechanism for determining
both the momentum and position of both particles simultaneously**

Thus providing a theoretical indication that either the Uncertainty Principle was incorrect or the Quantum Mechanics was incomplete

Nathan Rosen

(March 22, 1909 – December 18, 1995)

Measuring the Position of the Electron determines the Position of the Positron



Measuring the Momentum of the Positron determines the Momentum of the Electron

Quantum entanglement occurs when particles such as photons, electrons, etc interact physically and then become separated; this type of interaction is such that each resulting member of a pair is properly described by the same quantum mechanical state, which is indefinite in terms of important factors such as position, momentum, spin, polarization, etc

The EPR experiment involved two systems
that initially interact with each other
and are then separated.

Tetryonics provides a complete model of all Energy forms and Wave-Particle interactions.
Allowing a clear understanding of previously mysterious actions and processes in Quantum Mechanics

Showing that it is possible to know the Position and Momenta of Particles and
to model EM wave geometries and interactions in Quantum Physics

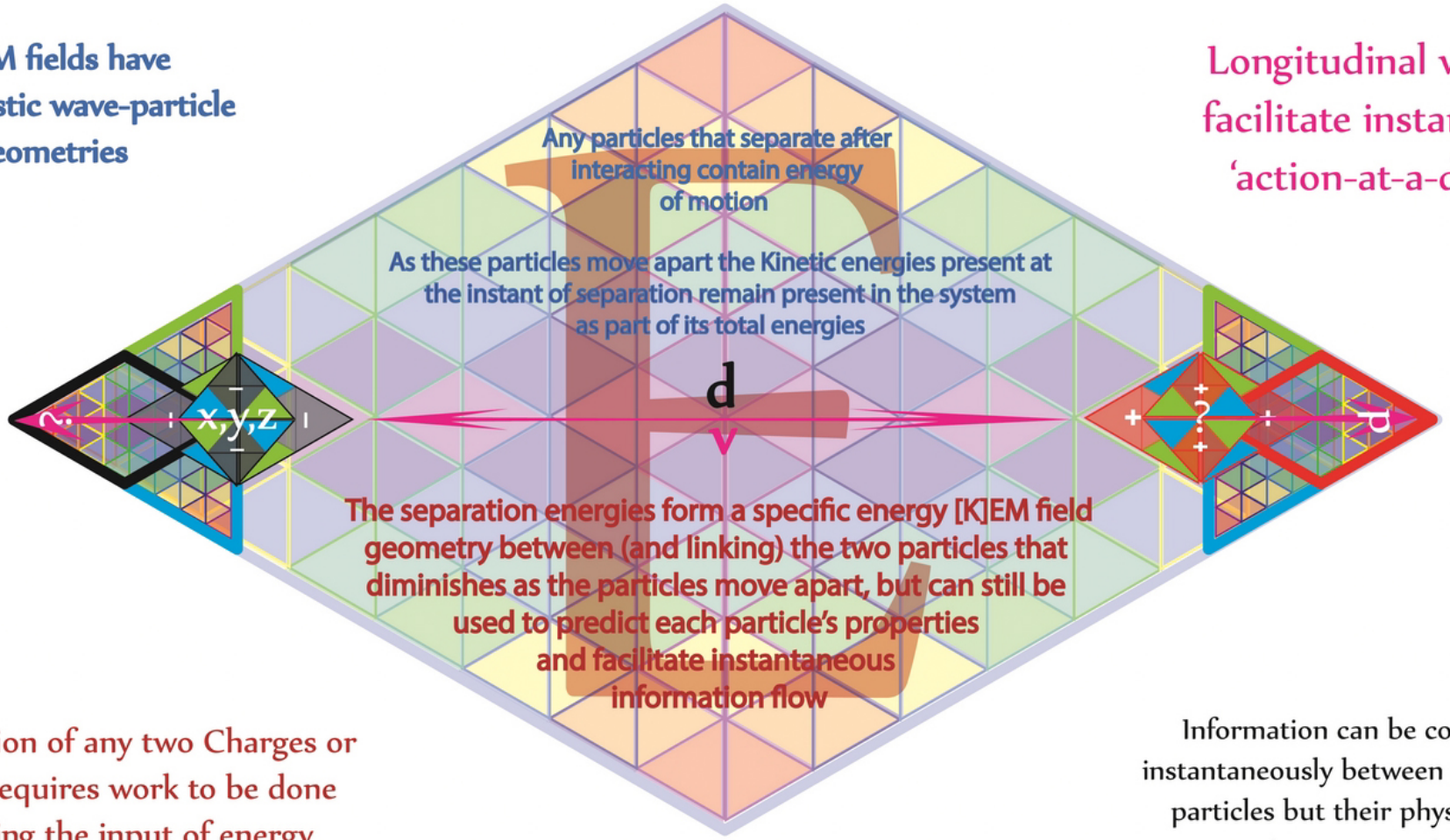
Quantum Entanglement

Occurs when particles such as photons, electrons, and other forms of EM mass-Energy interact physically and then become separated;
the type of interaction is such that each resulting member of a pair is properly described by the same quantum mechanical description (state),
which is indefinite in terms of important factors such as position, momentum, spin, polarization, etc.

When two entangled particles are separated by vast distances the measurement of a quantum (or physical) property of one particle suggests the instantaneous communication of this property to the entangled partner particle, irrespective of the distance between the two

All EM fields have probabilistic wave-particle geometries

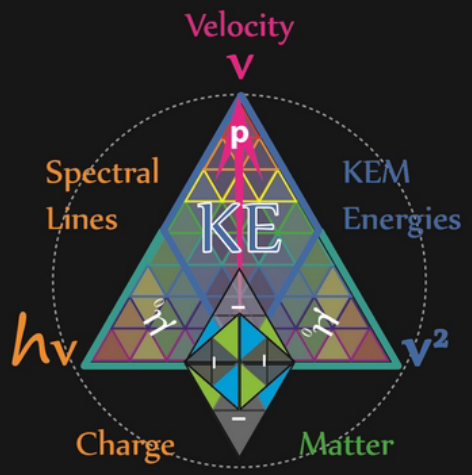
Longitudinal waves can facilitate instantaneous 'action-at-a-distance'



The separation of any two Charges or particles requires work to be done demanding the input of energy momenta quanta

Any system of particles, be they charged or not, can be modelled with Tetryonic geometries in order to reveal the true EM mechanics

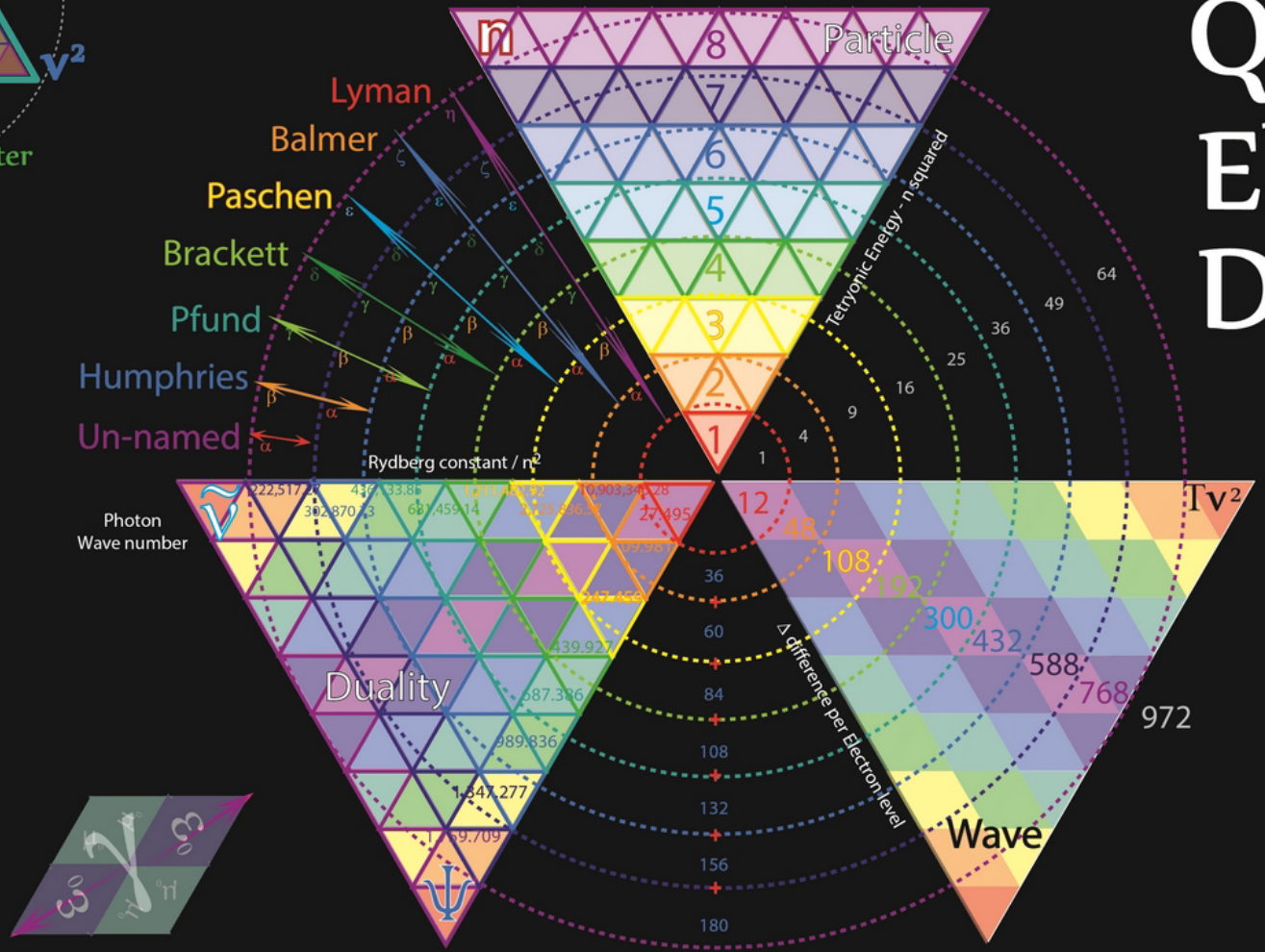
Information can be communicated instantaneously between vastly separated particles but their physical quantum properties are never indeterminant as dictated by the Uncertainty Principle



This completes

TETRYONIC

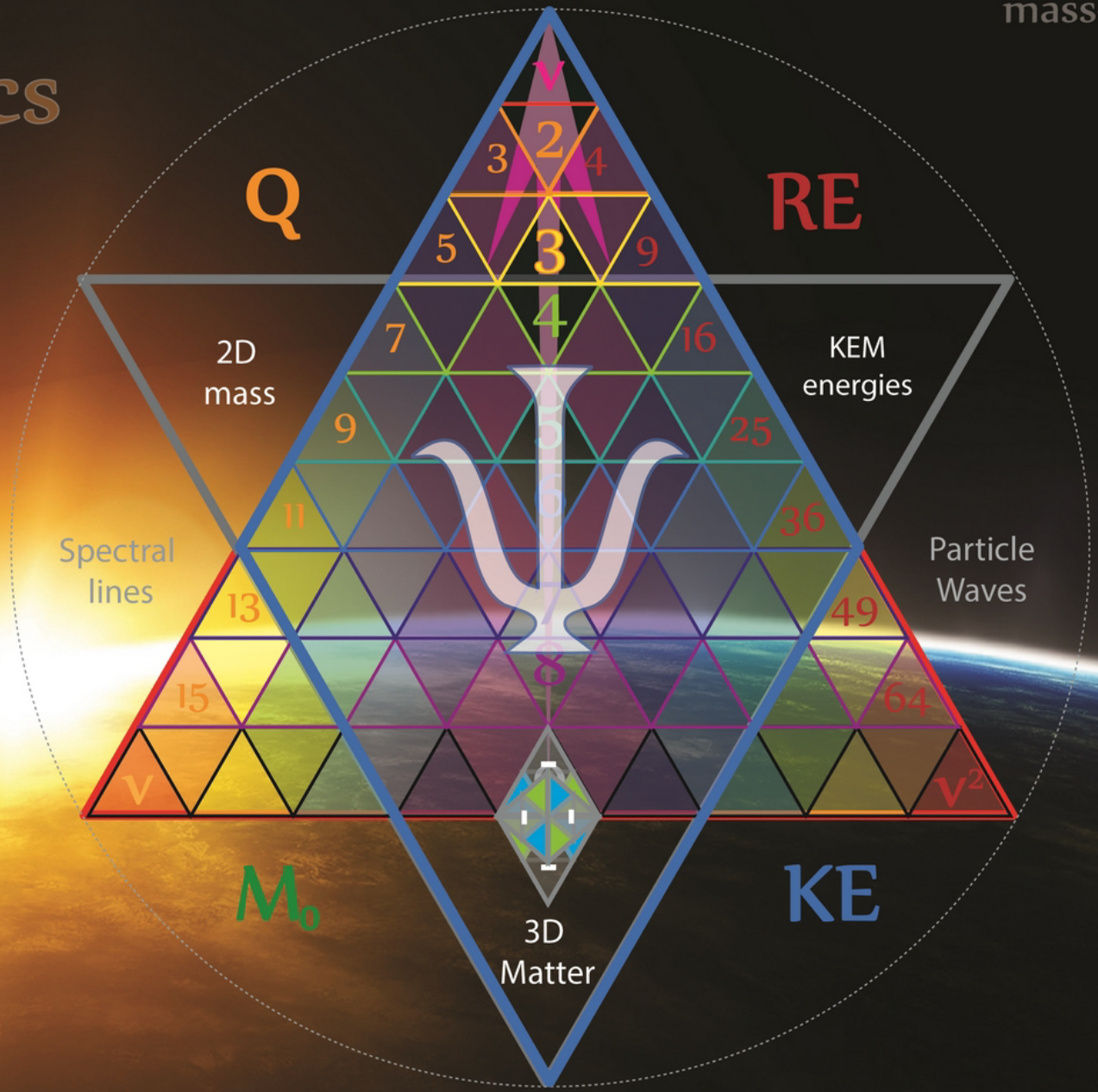
Quantum Electro Dynamics



The Charge geometry of Quantum Chemsitry follows

Tetryonic Dynamics

The Charged geometry of mass-ENERGY-Matter in motion



Quantum Mechanics | Quantum Electro Dynamics | Quantum Chemistry | Quantum Gravitation