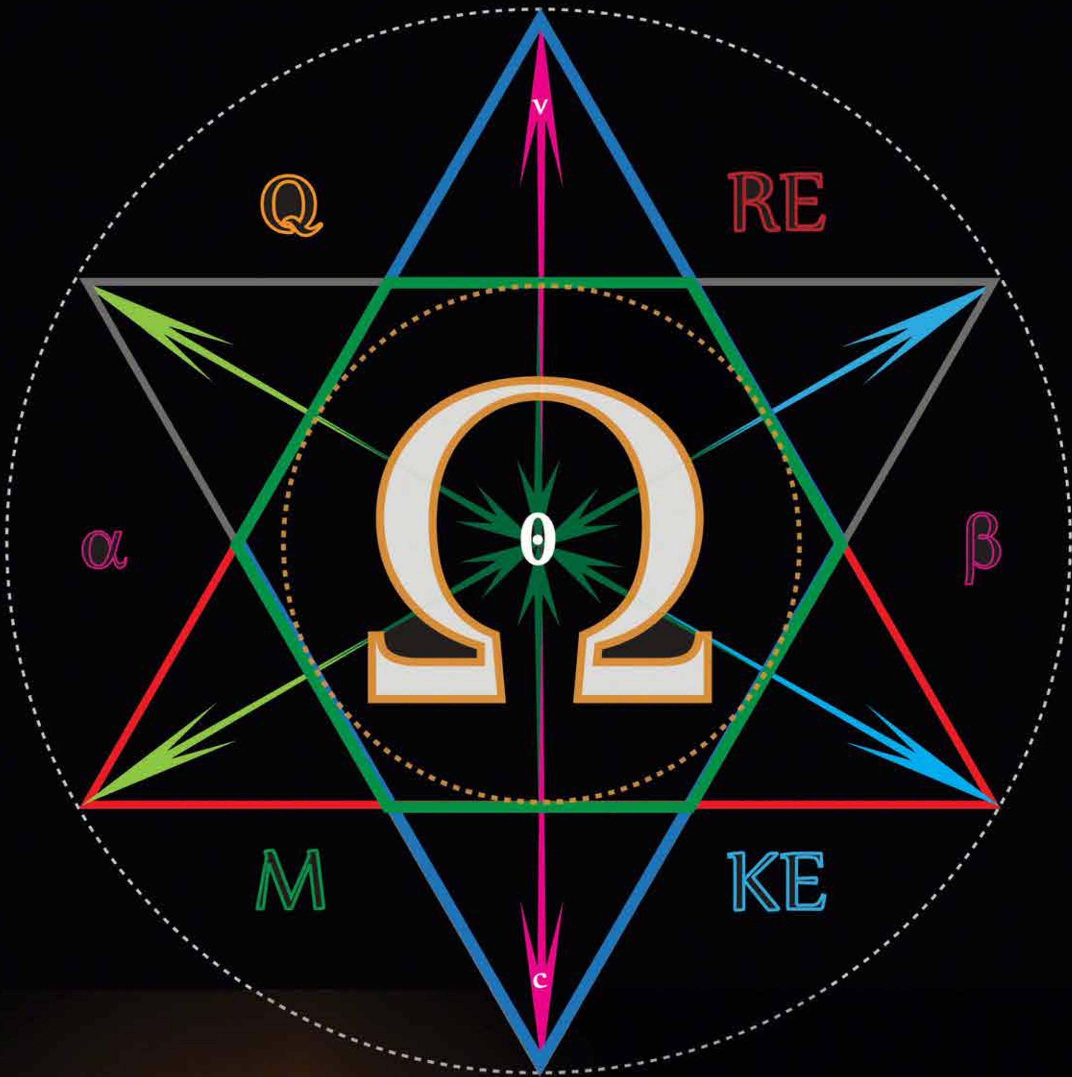
TETRYONICS

The equilateral geometry underpinning the mathematics of Physics



Foundational physics Mathematics

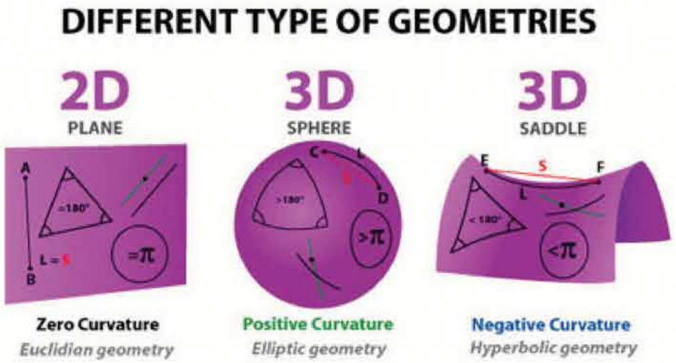
Abraham

ISBN 978-0-987288-5-5
[Second Edition © 2012]

Geometry and the Theory of Everything

Plato

(c.428-348 BC)



(studied by Omar Khayyam, Girolamo Saccheri, Bernhard Riemann, ...)

Euclid

(c.330-275 BC, fl. c.300 BC)

The Socratic tradition was not particularly congenial to mathematics, as may be gathered from Socrates' inability to convince himself that 1 plus 1 equals 2, but it seems that his student Plato gained an appreciation for mathematics after a series of conversations with his friend Archytas in 388 BC.

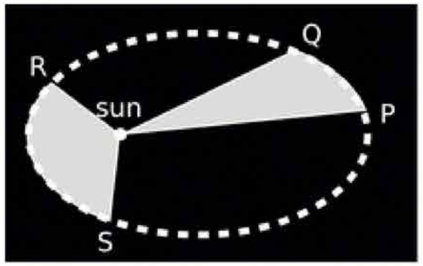
One of the things that most caught Plato's imagination was the existence and uniqueness of what are now called the five "Platonic solids".

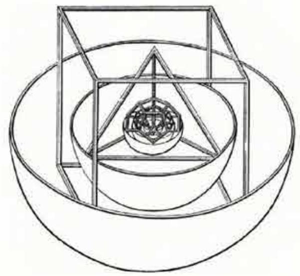
It's uncertain who first described all five of these shapes - it may have been the early Pythagoreans - but some sources (including Euclid) indicate that Theaetetus (another friend of Plato's) wrote the first complete account of the five regular solids.

Presumably this formed the basis of the constructions of the Platonic solids that constitute the concluding Book XIII of Euclid's Elements.

In any case, Plato was mightily impressed by these five definite shapes that constitute the only perfectly symmetrical arrangements of a set of (non-planar) points in space, and late in life he expounded a complete "theory of everything", in the treatise called Timaeus, based explicitly on these five solids.

Interestingly, almost 2000 years later, Johannes Kepler was similarly fascinated by these five shapes, and developed his own cosmology from them





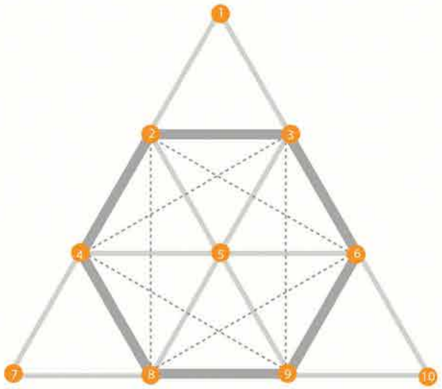
Tetractys

The Tetractys historically symbolized the four elements
[Earth, Air, Fire, and Water]
and the relationship between Humanity
and the cosmos created by GOD

The Greek Tetractys is a
triangular figure consisting of ten points
arranged in four rows:

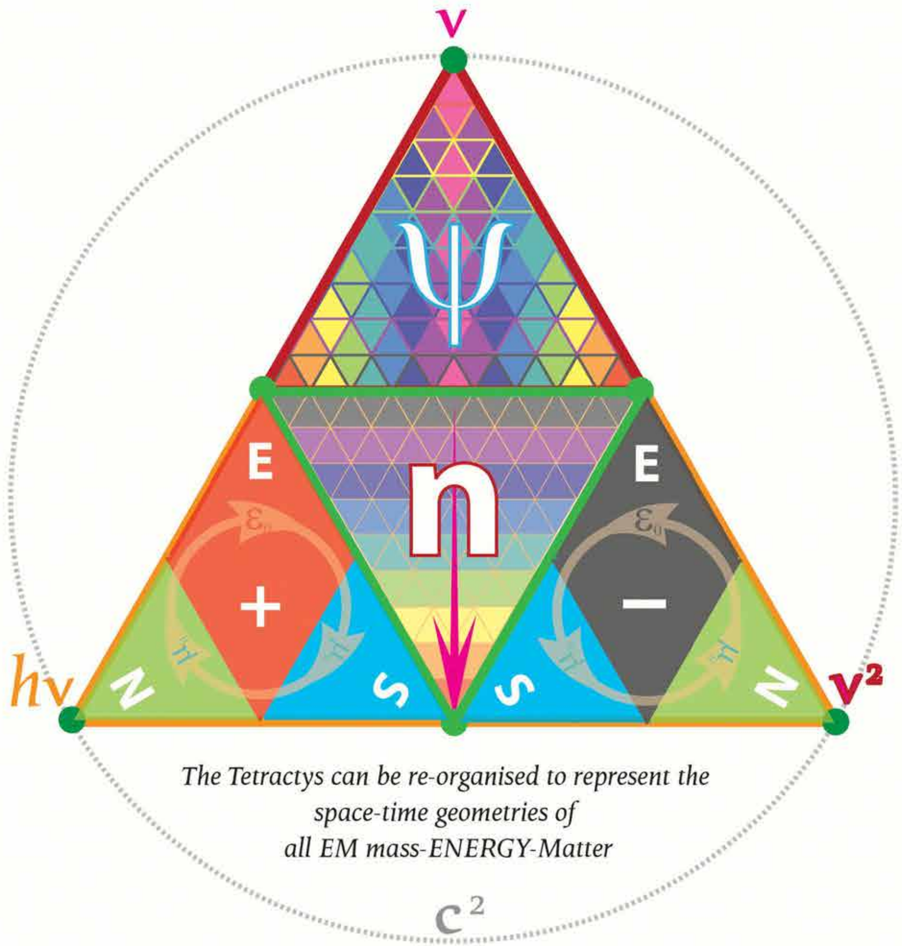
one, two, three, and four points in each row,
which is the geometrical representation of the
fourth triangular number.

As a mystical symbol, it was very important to
the secret worship of the Pythagoreans.



Sacred numbers

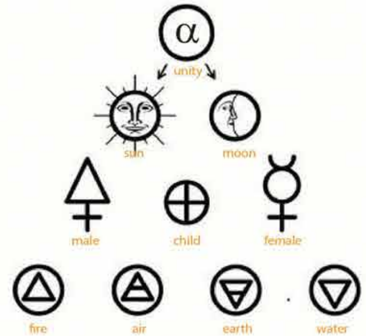
A



The Tetractys can be re-organised to represent the
space-time geometries of
all EM mass-ENERGY-Matter

The tetrad was the name given to
the number four -
in Pythagorean philosophy
there were four seasons
and four elements,
and the number was also associated
with planetary motions and music

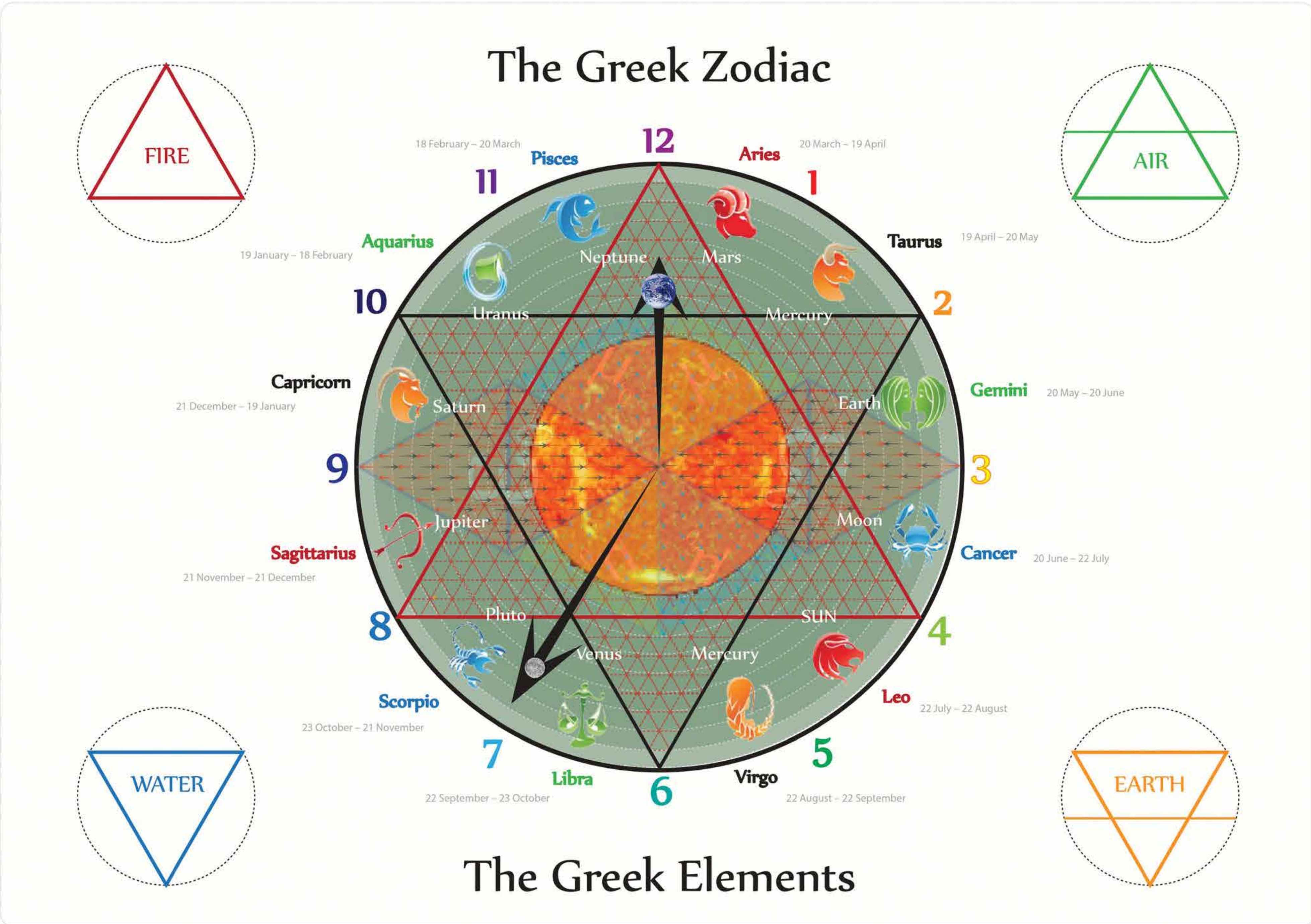
As a mystical symbol, it was very important to
the secret worship of the Pythagoreans.



The Cosmos

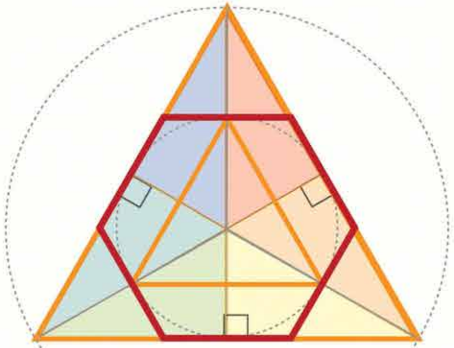
Ω

The single triangle in the first row represents zero-dimensions (a point)
A vector direction in one-dimension can be represented as a line between any two points
The second row represents a Boson (two-dimensions in a plane defined by a rhombus of three triangles)
The whole figure folded represents three-dimensions (a tetrahedron defined by four apex points)
Photons of ElectroMagnetic mass-Energy quanta are represented by two opposing triangles

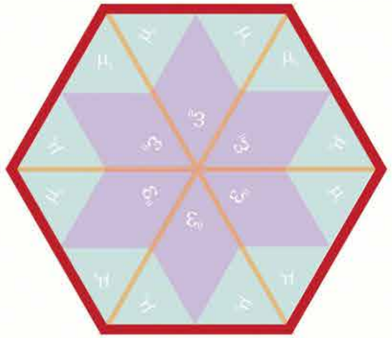

The Greek Zodiac
FIRE
AIR
WATER
EARTH
12
Aries
20 March – 19 April
1
Taurus
19 April – 20 May
2
Gemini
20 May – 20 June
3
Cancer
20 June – 22 July
4
Leo
22 July – 22 August
5
Virgo
22 August – 22 September
6
Libra
22 September – 23 October
7
Scorpio
23 October – 21 November
8
Sagittarius
21 November – 21 December
9
Capricorn
21 December – 19 January
10
Aquarius
19 January – 18 February
11
Pisces
18 February – 20 March
Neptune
Mars
Uranus
Mercury
Saturn
Earth
Jupiter
Moon
Pluto
SUN
Venus
Mercury
The Greek Elements

Equilateral Triangles

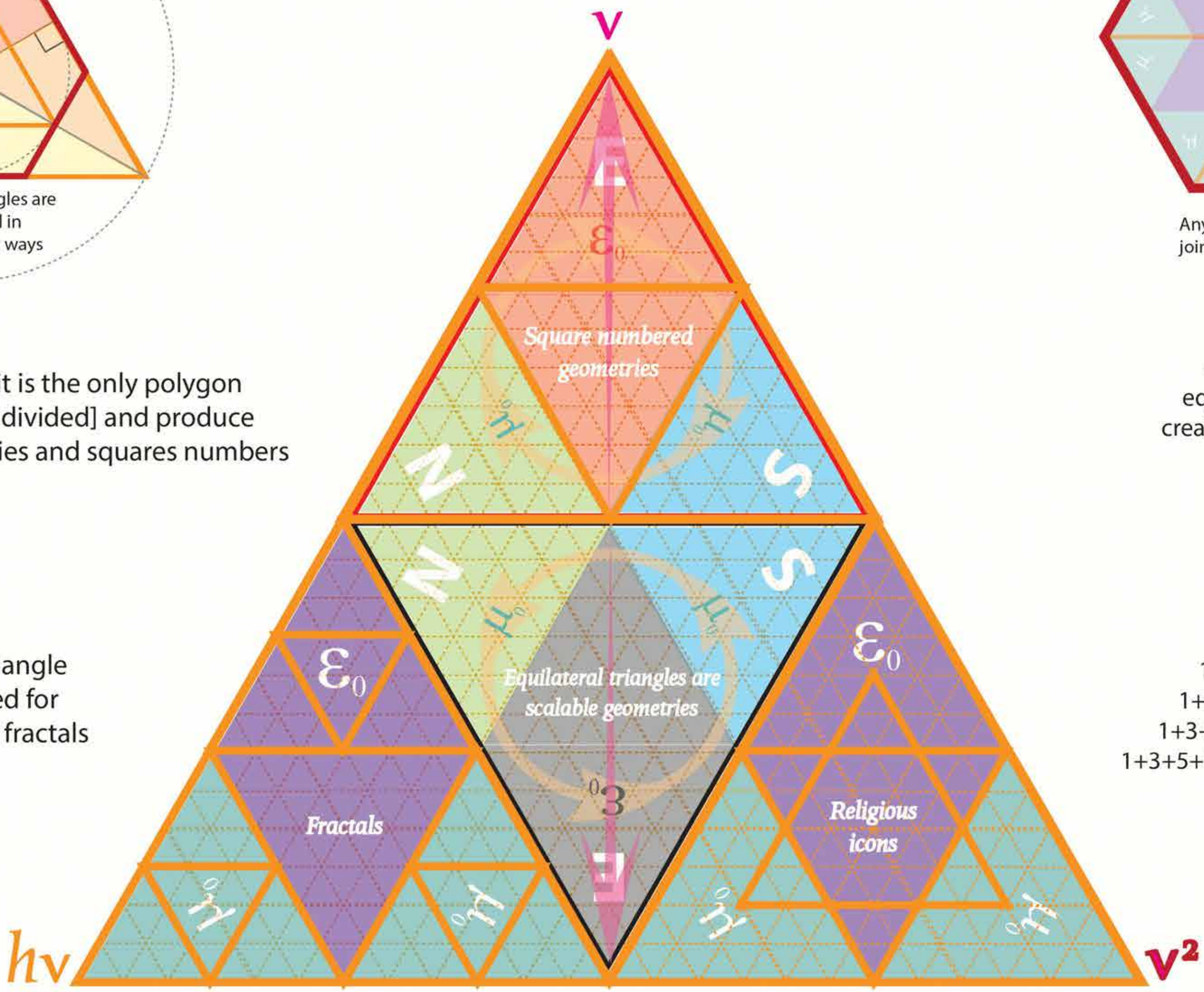
An equilateral triangle is a triangle in which all three sides are equal



Equilateral triangles are symmetrical in many different ways



Any six equilateral triangles joined can make a hexagon.



It is unique in that it is the only polygon that can be tiled [or divided] and produce only identical geometries and squares numbers

The equilateral triangle is eminently suited for the construction of fractals

The tesselation of odd numbered equilateral triangles creates square numbers

That is,

1
1+3 = 4
1+3+5 = 9
1+3+5+7 = 16
1+3+5+7+9 = 25
1+3+5+7+9+11 = 36
1+3+5+7+9+11+13 = 49
1+3+5+7+7+9+11+13+15 = 64
etc

An equilateral triangle is simply a specific case of a regular polygon with 3 sides

The Pythagorean Theorem

Though attributed to Pythagoras, it is not certain that he was the first person to prove it.

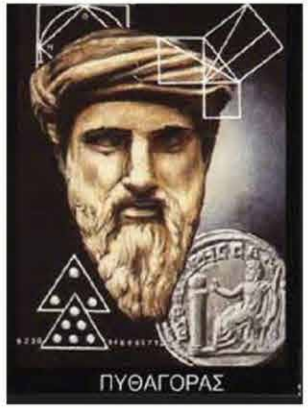
The first clear proof came from Euclid, and it is possible the concept was known 1000 years before Pythoragas by the Babylonians

$$a^2 + b^2 = c^2$$

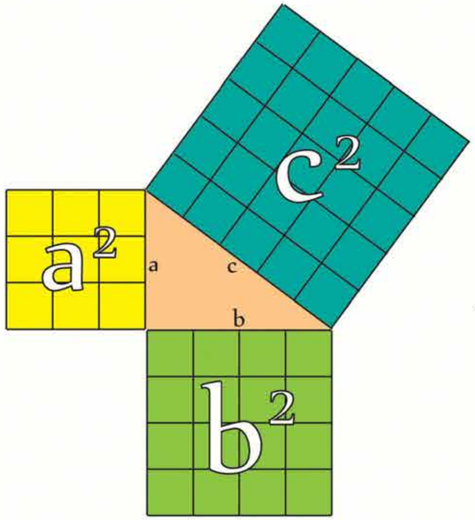
The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.

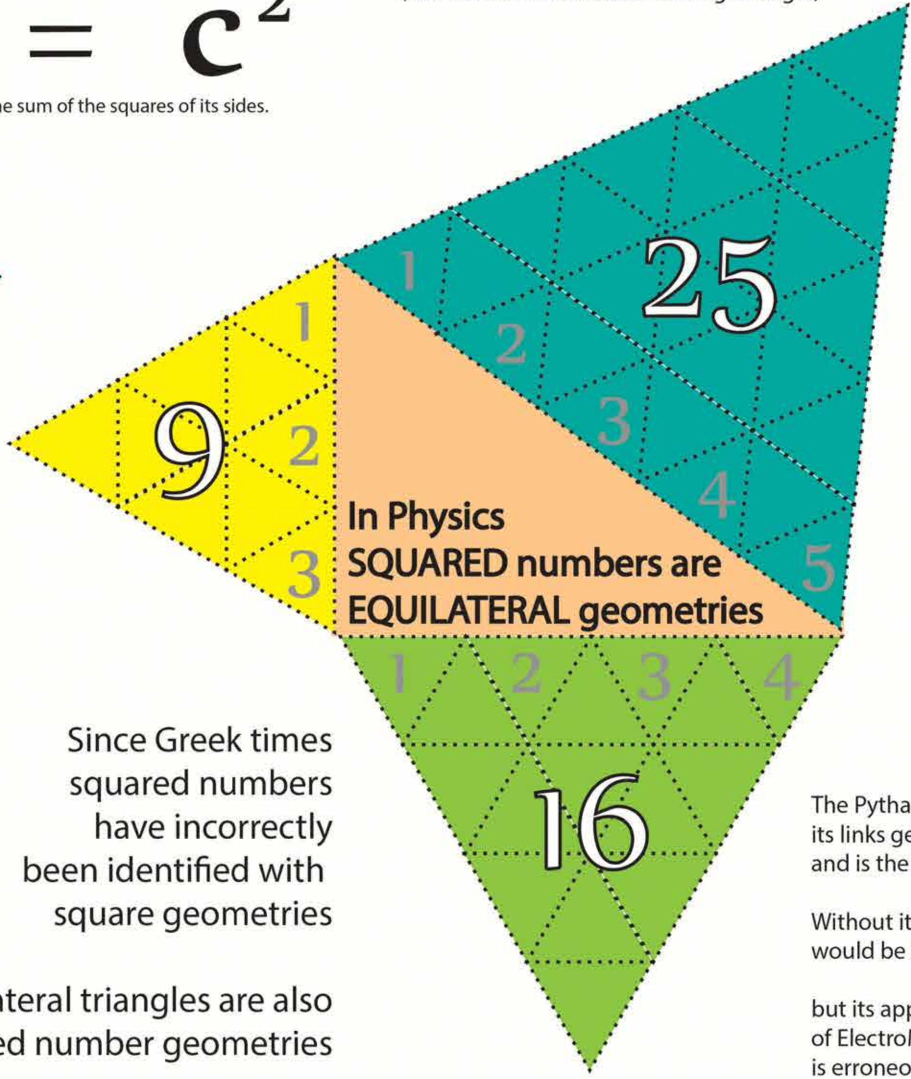
In any right triangle,
the area of the square whose side is the hypotenuse
(the side opposite the right angle) is equal to
the sum of the areas of the squares
whose sides are the two legs
(the two sides that meet at a right angle)

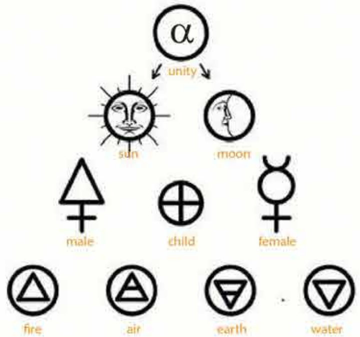
Pythagoras of Samos



about (570 – 495 BC)







Pythagorean Tetractys

Since Greek times
squared numbers
have incorrectly
been identified with
square geometries

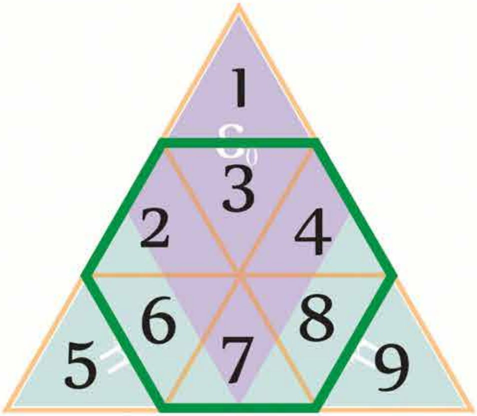
Equilateral triangles are also
squared number geometries

The Pythagorean equation is at the core of much of geometry,
its links geometry with algebra,
and is the foundation of trigonometry.

Without it, accurate surveying, mapmaking, and navigation
would be impossible,

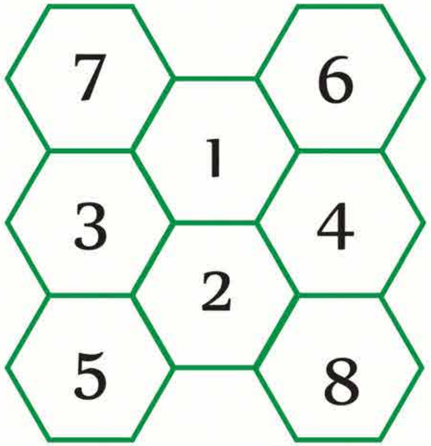
but its application to the energy-momenta geometries
of ElectroMagnetic fields and Matter in motion in Physics
is erroneous and must be corrected for science to advance

Hexagons



Energy geometries

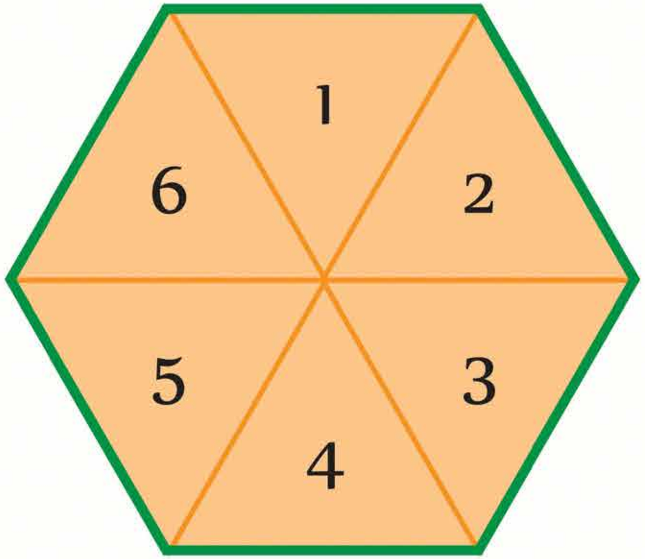
Atomic nuclei geometries



Hexagons can be tiled or tessellated in a regular pattern on a flat two-dimensional plane

A regular hexagon can be subdivided into six equilateral triangles

Hexagons are the only regular polygon that can be subdivided into another regular polygon

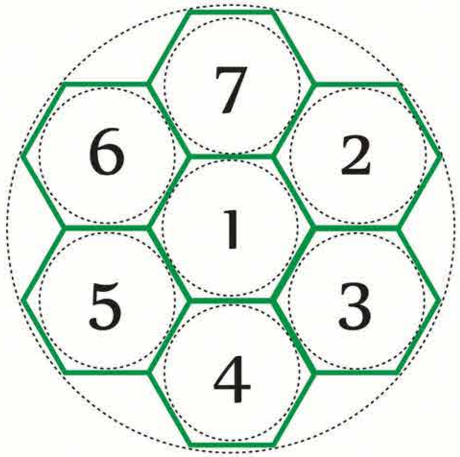


Hexagons are the unique regular polygon such that the distance between the center and each vertex is equal to the length of each side

Six is a highly composite number, the second-smallest composite number, and the first perfect number.

That is, 1*2*3=1+2+3=6

An interesting relationship between circular and hexagonal geometry is that hexagonal patterns often appear spontaneously when natural forces are trying to approximate circles

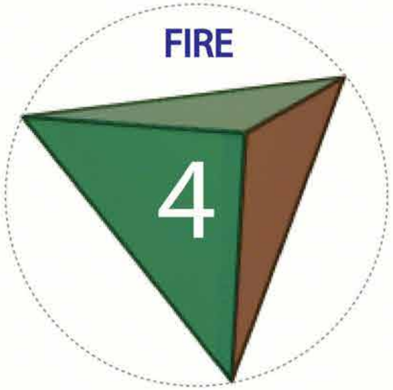


Hexagonal tessellation is topologically identical to the close packing of circles on a plane

Platonic Solids

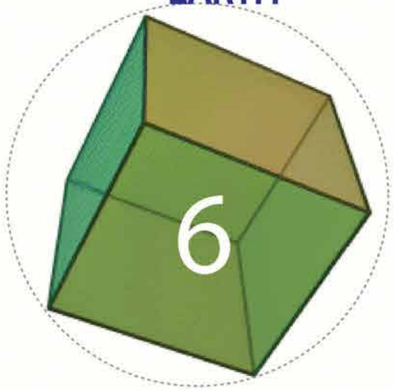
The Pythagoreans knew that there were only five regular convex solids, the tetrahedon, cube, octahedron, icosohedron and dodecahedron and each one could be accurately circumscribed by a sphere.

FIRE



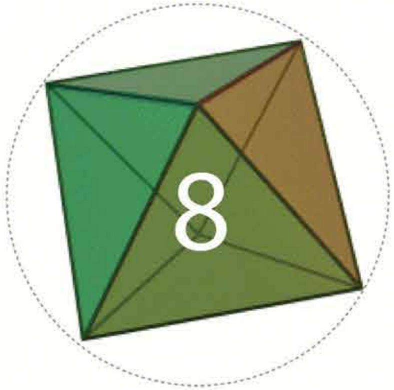
4 triangles meet to form a Tetrahedron

EARTH



6 squares meet to form a Cube

AIR



8 triangles meet to form a Octahedron

2 *tetryons*

regular deltahedrons

5 *leptons*

quarks 7

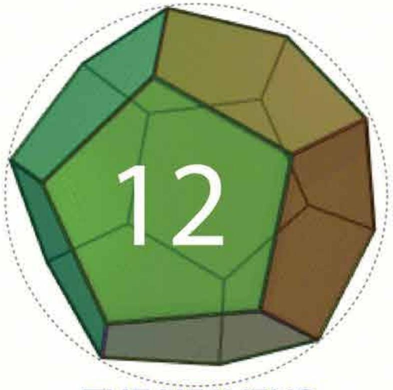
regular deltahedrons

Baryons 18

F - E + V = 2

faces edges vertexs

12 pentagons meet to form a Dodecahedron



THE HEAVENS

Plato

(c.428-348 BC)

The philosopher Plato concluded that they must be the fundamental building blocks – the atoms – of nature, and assigned to them what he believed to be the essential elements of the universe.

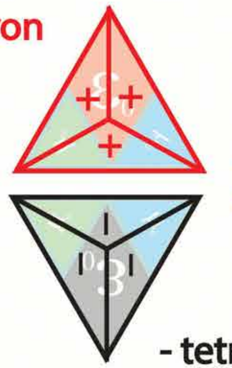
20 triangles meet to form a Icosahedron

WATER

Tetryonic Solids

Despite their unique topologies Tetryonic solids are not unlike Platonic solids save that their toplogies are comprised entirely from complex hitherto undescribed **4nπ equilateral Planck mass-energy momenta geometries** that also match the Euler numbers of Platonic solids

+ tetryon

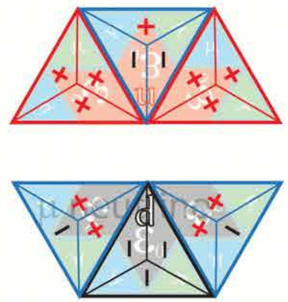


4 faces
6 edges
4 vertices

2

- tetryon

up quark



2

8 faces
12 edges
6 vertices

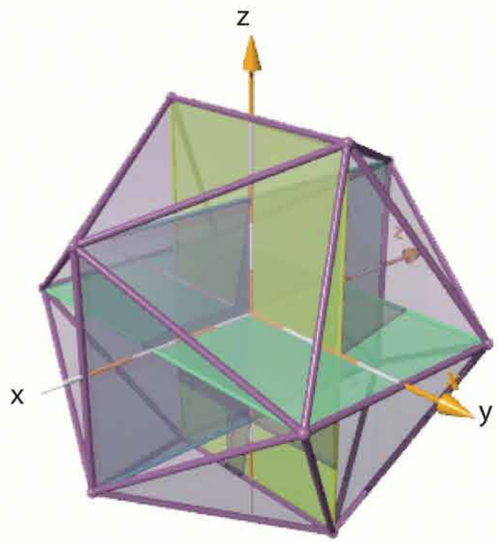
down quark

mass geometries | Matter topologies

4π *tetryons* **4π**

regular deltahedrons

12π *leptons* **12π**



Matter topologies | mass geometries

8π *quarks* **12π**

regular deltahedrons

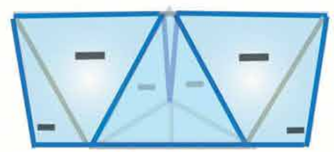
20π *Baryons* **36π**

neutrino

electron

12 faces
18 edges
8 vertices

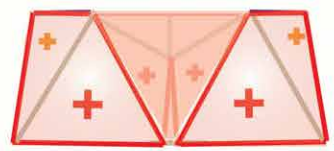
2



Neutron

2

Proton



20 faces
30 edges
12 vertices

Their equilateral topologies are best described as regular topologic-deltahedrons:

tetra-delta-hedrals	**tetryons**	4π external charge fascia
octa-delta-hedrals	**quarks**	8π external charge fascia
dodeca-delta-hedrals	**leptons**	12π external charge fascia
icoso-delta-hedrals	**Baryons**	20π external charge fascia

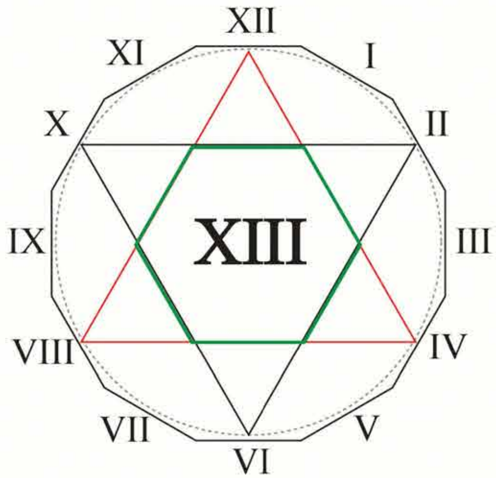
note:
Charged mass-energy fascia geometries and edges become "hidden" upon the meshing of delta-hedra to form Matter topologies

Euclidean geometry

Euclid

(c.330-275 BC, fl. c.300 BC)

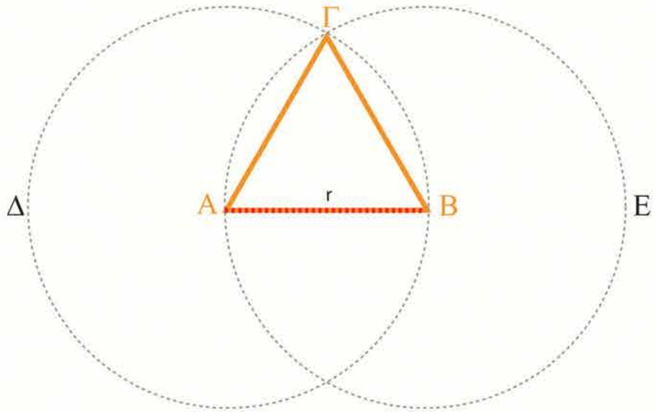
Arguably the most influential Mathematics book ever written is Euclid's 'The Elements'



In all, it contains 465 theorems and proofs, described in a clear, logical and elegant style, and using only a compass and a straight edge.

The Elements - Book 1 - Definition 20

Of the trilateral figures, an equilateral triangle is that which has its three EQUAL sides



Euclid's Elements - Book 1 - Proposition 1
Method of constructing an Equialteral triangle

Euclid's five general axioms were:

Things which are equal to the same thing are equal to each other.

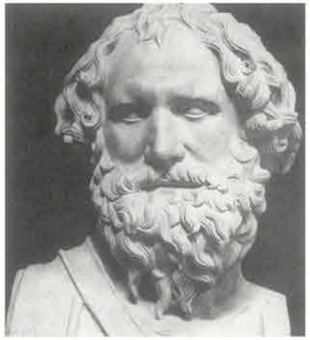
If equals are added to equals, the wholes (sums) are equal.

If equals are subtracted from equals, the remainders (differences) are equal.

Things that coincide with one another are equal to one another.

The whole is greater than the part

Archimedes



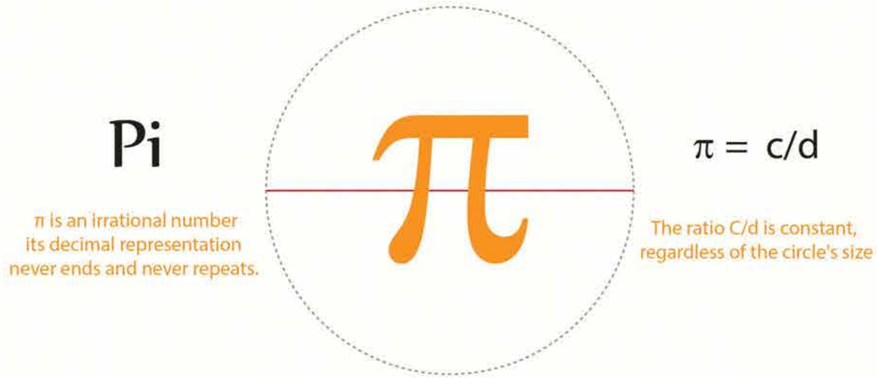
c. (287 BC – c. 212 BC)

As its definition relates to the circle,
π is found in many formulae in trigonometry and geometry,
especially those concerning circles, ellipses, or spheres.

It is also found in formulae from other branches of science,
such as cosmology, number theory, statistics, fractals,
thermodynamics, mechanics, and electromagnetism

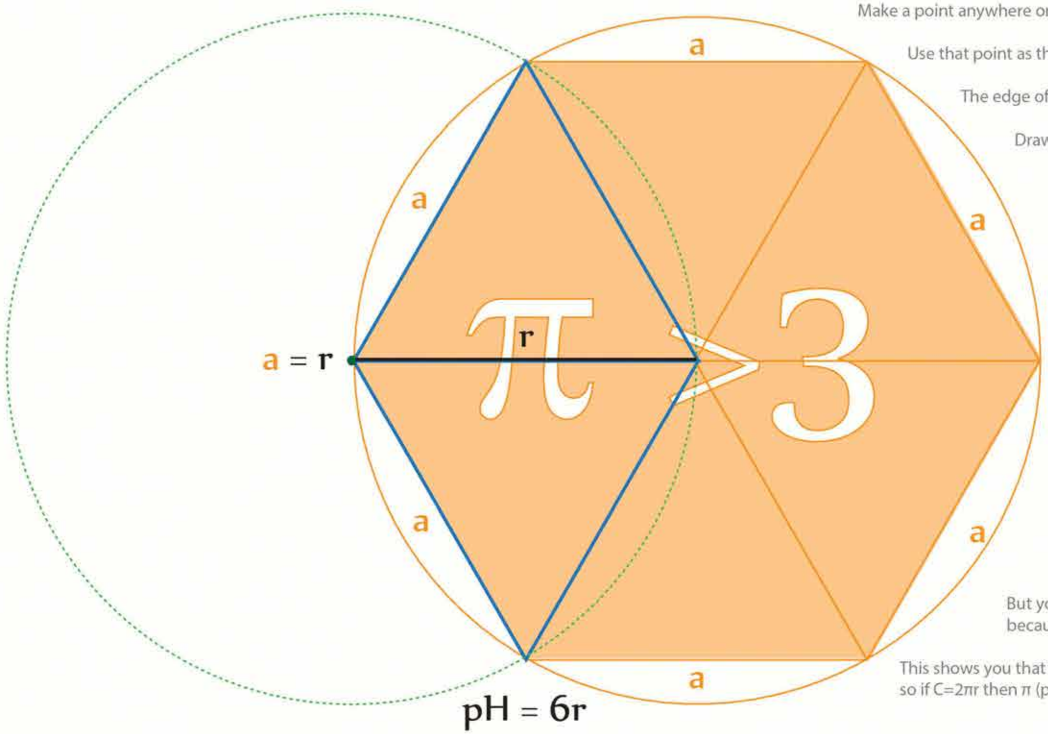
Incorrect identification of Pi [c/d] as opposed to Pi radians
in Physics has led to the inappropriate association
of spherical particles to the physical sciences
whereas equilateral triangles & tetrahedra
form its true geometry

The number π is a mathematical constant that is
the ratio of a circle's circumference to its diameter.



3.141592654.......

Proof of the fact that C=2πr and how Archimedes proved it



Draw any circle.

Make a point anywhere on the circumference of the [green] circle.

Use that point as the center of a second [blue] circle with the same radius as the green circle.

The edge of the blue circle should touch the center of the green circle.

Draw the line segment connecting the centers of the two circles.

That forms the radius of both of the circles.

Now draw the line connecting the center of the blue circle to where it crosses the green circle on both sides, and complete the triangles.

You should have two equilateral triangles whose sides are equal to the radius of the green circle

Now extend all of the radius lines so they become diameter lines, all the way across the circle, and finish drawing all of the triangles to connect them.

You've got six equilateral triangles now, that make an orange hexagon.

So the perimeter of your hexagon is the same as six times the radius of your circle.

But your circumference is a little bigger than the perimeter of your hexagon, because the shortest distance between two points is always a straight line.

This shows you that the circumference of the blue circle has to be more than 6r, so if C=2πr then π (pi) has to be a little bigger than 3, which it is.

The more sides we draw on our polygon, the closer we will get to the real value of pi (3.14159 etc.).
Using a polygon with 96 sides, Archimedes was able to calculate that π was a little bigger than 3.1408

The Golden Ratio

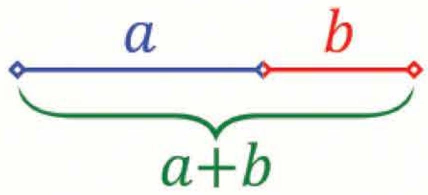
Two quantities are in the golden ratio (φ) if the ratio of the sum of the quantities to the larger quantity is equal to the ratio of the larger quantity to the smaller one.

The figure to the right illustrates the geometric relationship

[1.61803]

velocity vectors

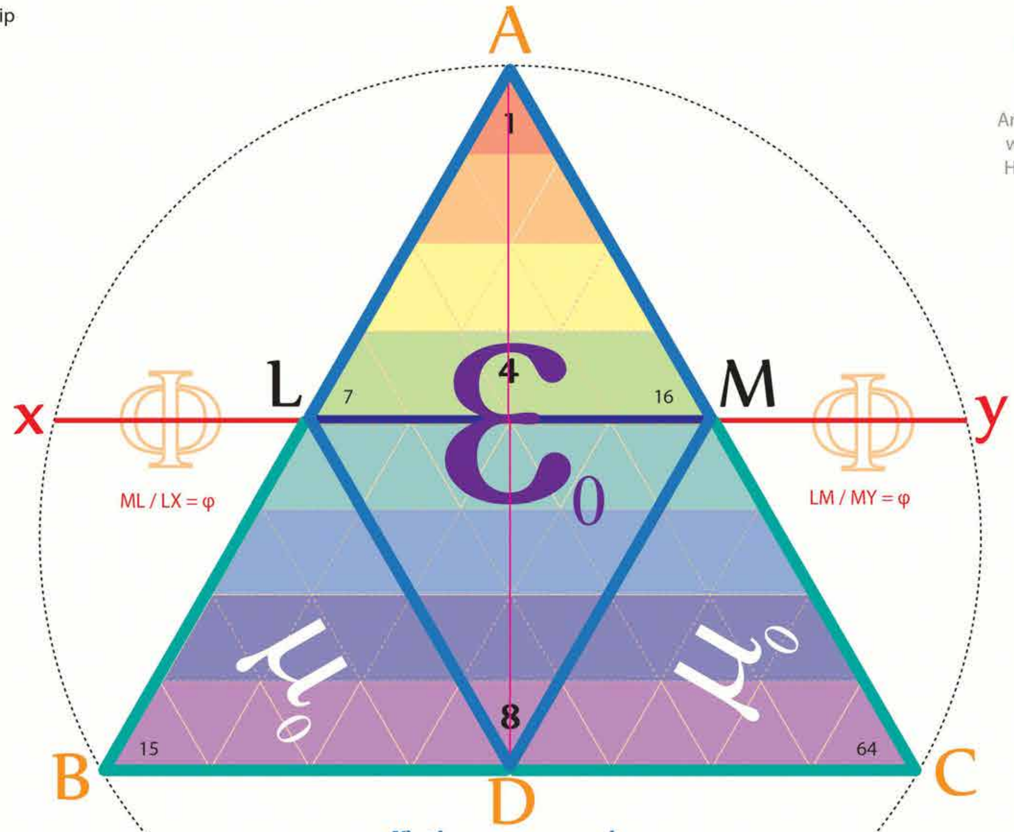
The height of the triangle [ALM] produced by the bisecting line is 1/2 the height of the height of [ABC]



$a+b$ is to a as a is to b

An intriguing showing of φ in an equilateral triangle was observed by George Odom, a resident of the Hudson River Psychiatric Center, in the early 1980s

L Interior line length [LM] of the bisector line is equal to 1/2 the side of the original triangle [BC] [AB] or [CA] M



M The exterior lines [My] and [Lx] are Phi ratios of the interior line [LM] y

Φ

Golden ratio phi

Kinetic **energies**

The area of the E-field permittivity diamond [ALDM] produced by the golden ratio bisector is 1/2 the area of the original equilateral Planck energy triangle [ABC]

mass $\frac{c^2}{sec}$ energy

$$\hbar = \frac{h}{2\pi}$$

Tetryonic geometry reveals the maximum E-field amplitude of the reduced Planck constant to be an example of the Golden ratio in physics

Planck's constant [h]

Let L and M be the midpoints of the sides AB and AC of an equilateral triangle ABC

By measurement and the Intersecting Chords Theorem

MX·MY = AM·MC.

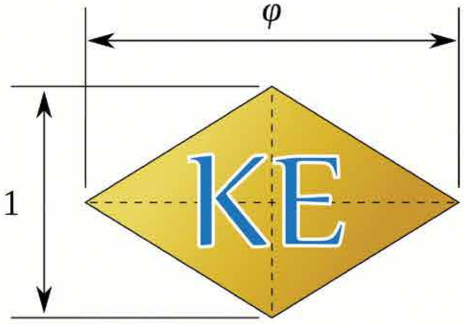
which is of the form

(a + b)·b = a·a.

Denoting a/b = x, we see that

$1 + x = x^2$,

George Odom



The Golden Rhombus

Applying the golden ratio (φ) to quantum scale electrodynamic geometry we can quickly determine that the linear momentum and magnetic moment vectors of photons & EM waves can also be expressed as a golden ratio

vector velocities

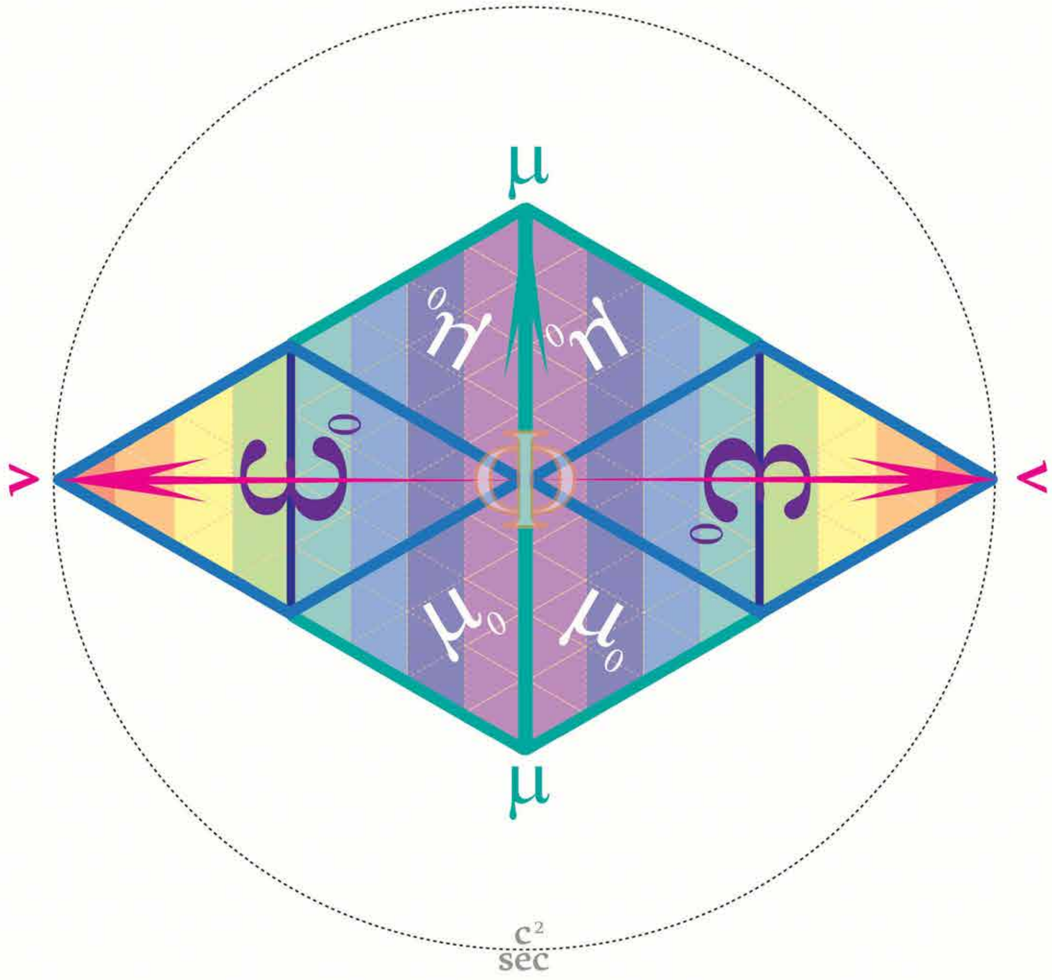
vs

magnetic vector

Φ

Golden ratio phi

[1.61803]

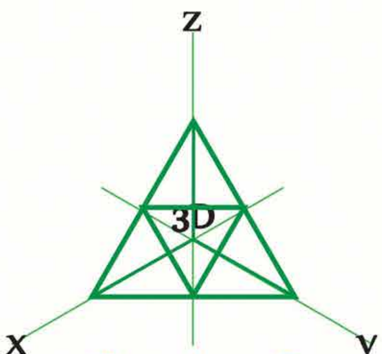


magnetic Force

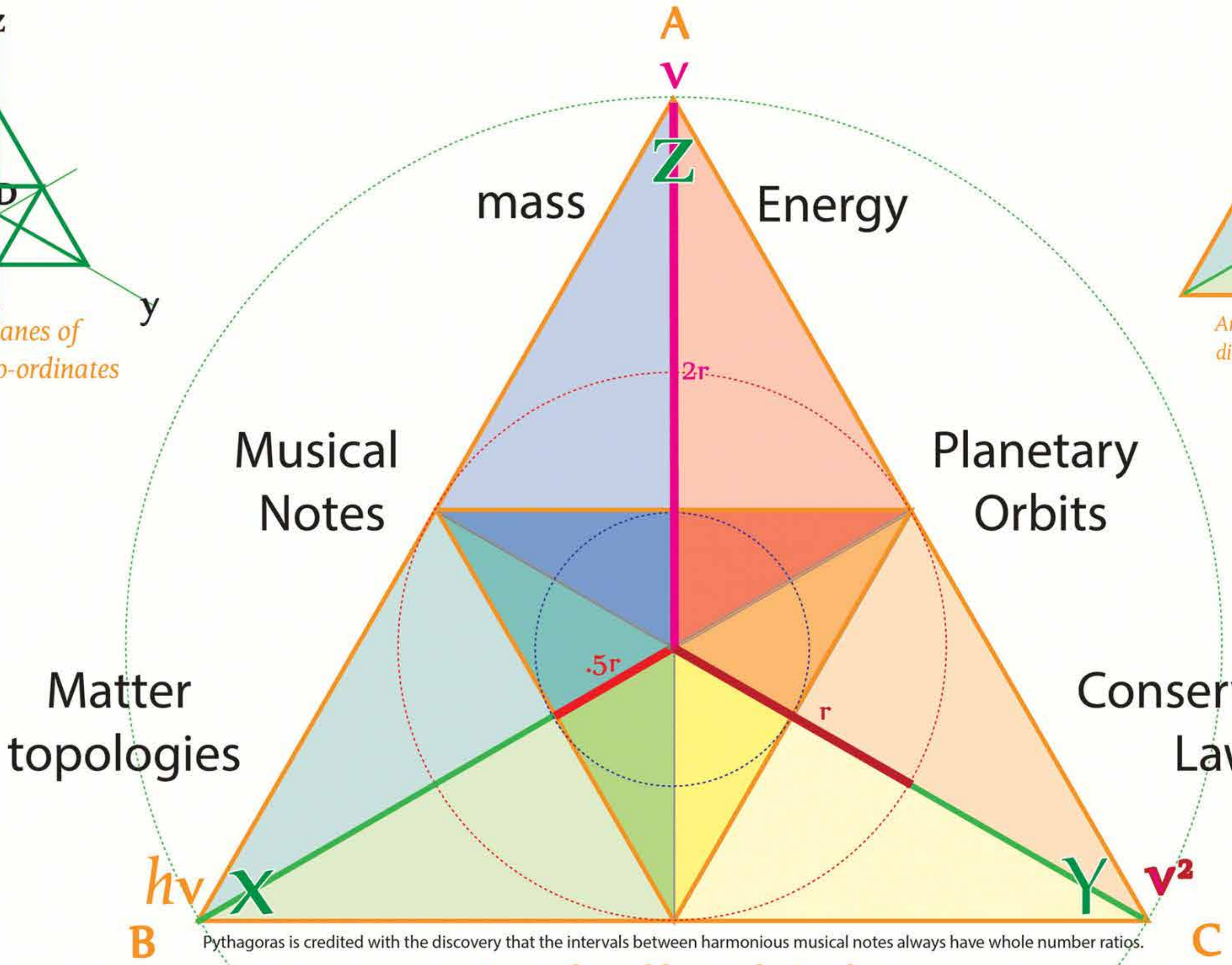
vs

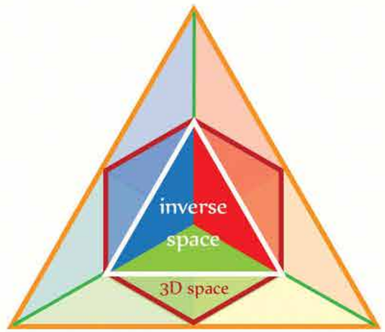
electric Force

photons of EM energy



The 3 planes of Cartesian co-ordinates



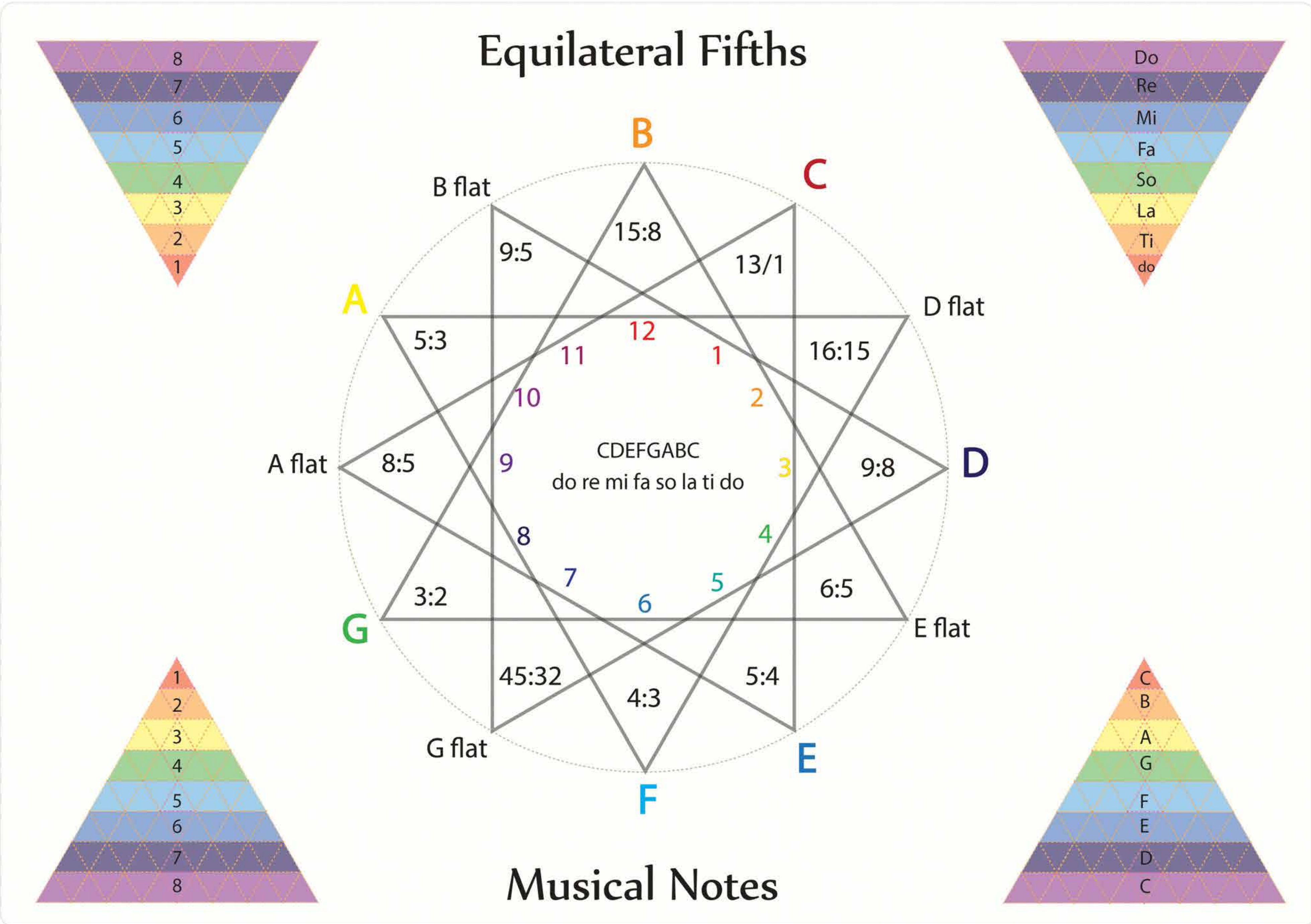


An equilateral [square] triangle divided into 12 equal semitones

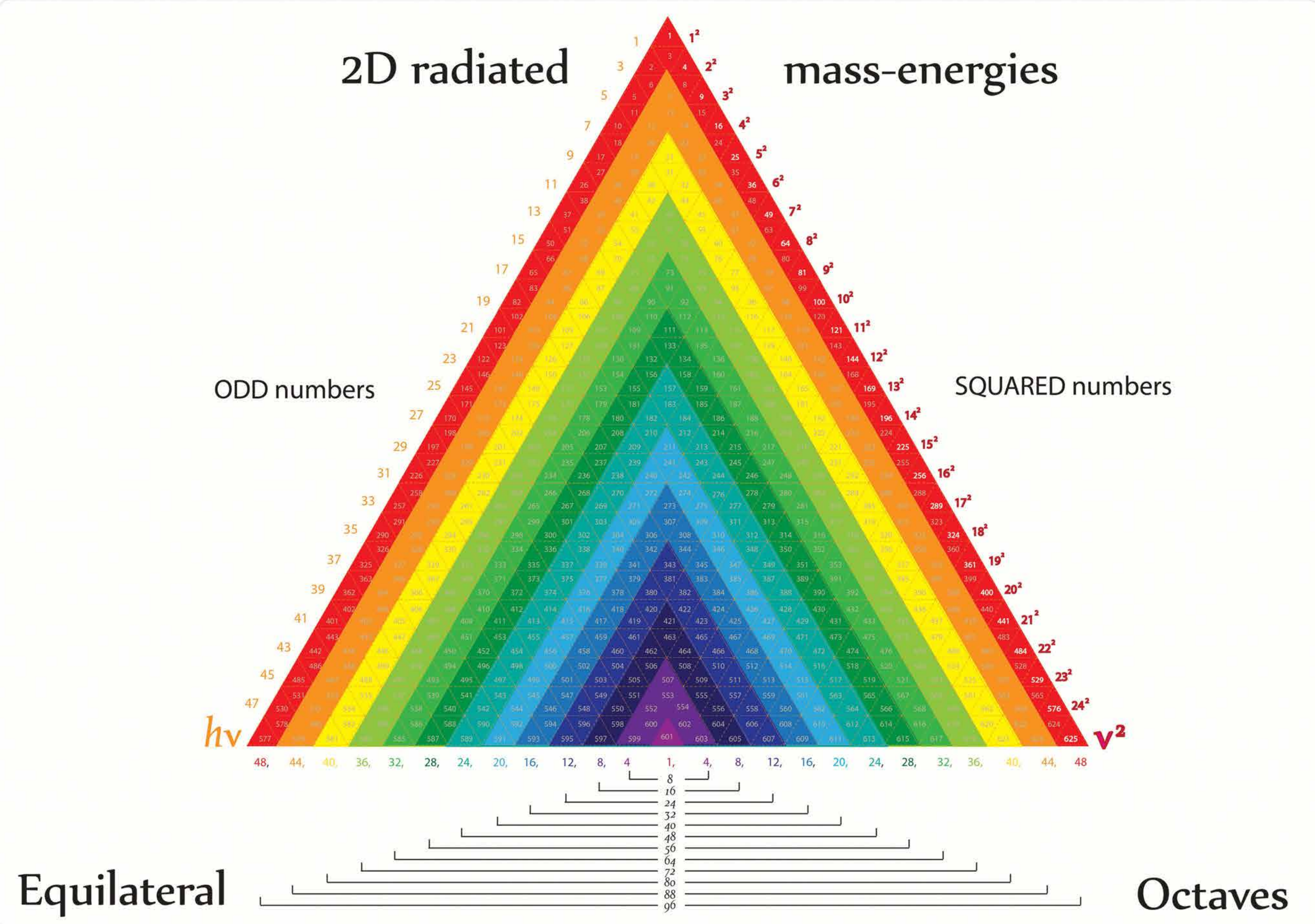
Pythagoras is credited with the discovery that the intervals between harmonious musical notes always have whole number ratios.

An equilateral [square] triangle
divided into 6 equal semitones
and 6 equal quarter tones

With an Equilateral triangle, draw lines from the center of the circle to each vertex and each midpoint, creating six right triangles, as shown with six different colored triangles.
Each right triangle has a radius of the circle for one leg, and half of a side of the original triangle for another.
Any two right triangles sharing one of the radial lines must therefore be congruent, and that implies that the hypotenuses of the triangles are all equal.
This in turn shows that the six right triangles are all congruent, and so the large triangle they combine to form is equilateral

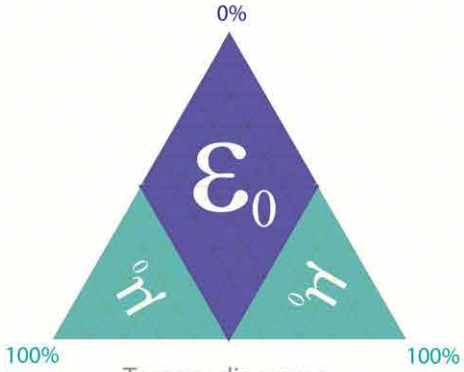


Tetryonics 81.14- Equilateral Fifths

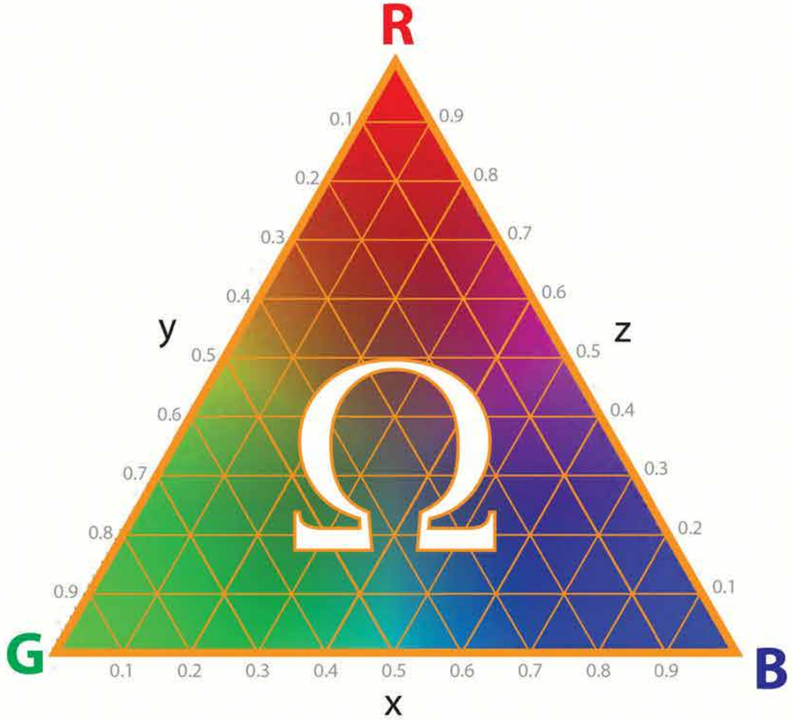

2D radiated
mass-energies
ODD numbers
SQUARED numbers
hv
v²
Equilateral
Octaves
8
16
24
32
40
48
56
64
72
80
88
96

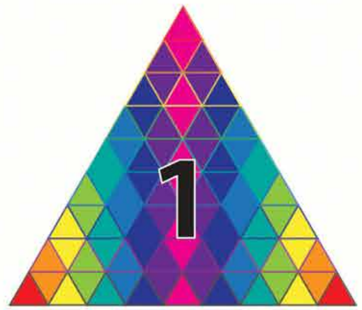
Ternary Diagrams

Viviani's Theorem implies that lines parallel to the sides of an equilateral triangle provide (homogeneous/barycentric/areal/trilinear) coordinates for ternary diagrams for representing three quantities A,B,C whose sum is a constant (which can be normalized to unity).



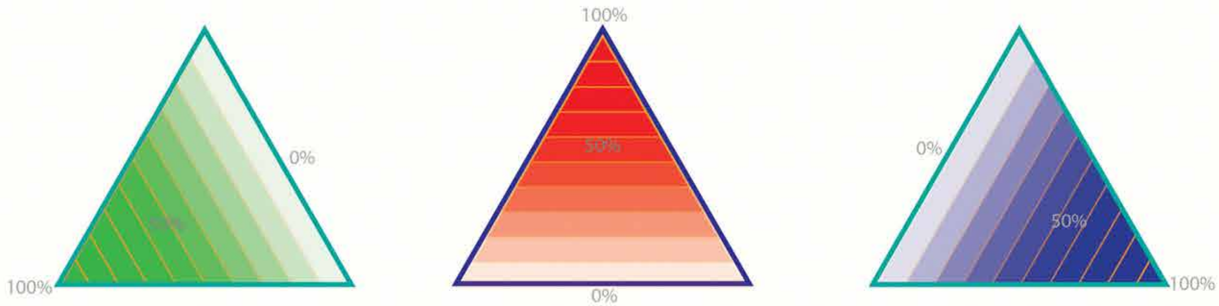
Ternary diagrams should NOT be used to model EM field strengths





In a ternary plot, of EM energy the Electric field [E] and the Magnetic dipole [N-S] must renormalise to 1

A ternary diagram is simply a triangular coordinate system in which the 3 edges correspond to the axes.



Trilinear charts are commonly used for finding the result of mixing three components (such as gases, chemical compounds, soil, color, etc.) that add to 100% of a quantity.

Whilst the Pythagorean Theorem boasts a slightly greater economy of terms than the Eutrigon Theorem (Wayne Roberts 2003), the latter contains an important area not included in the former:

the area enclosed or swept out by the three points of the triangle in question

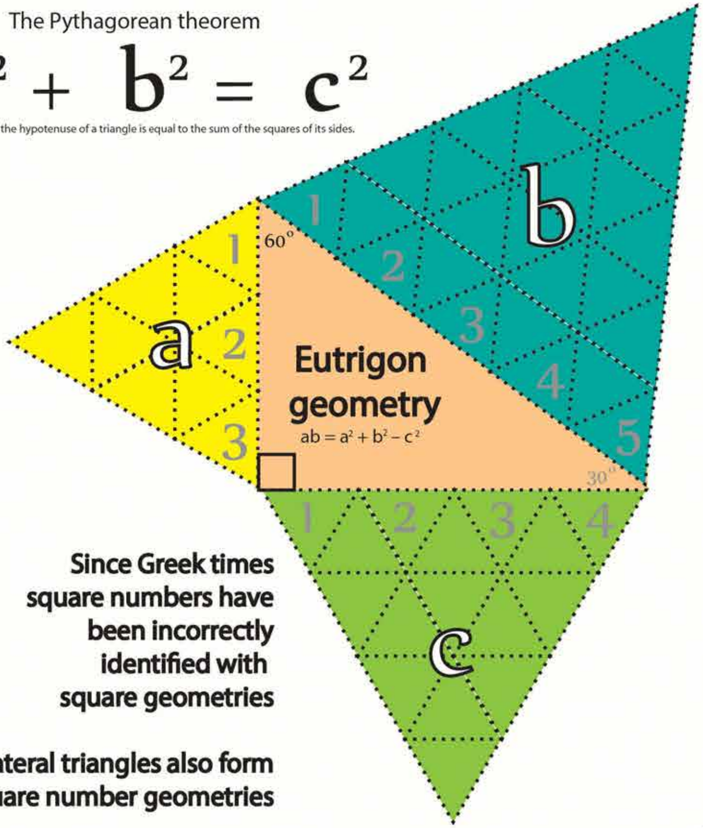
$$ab = a^2 + b^2 - c^2$$

the area of any eutrigon is equal to the combined areas of the equilateral triangles on legs 'a' and 'b', minus the area of the equilateral triangle on its hypotenuse 'c'.

The Pythagorean theorem

$$a^2 + b^2 = c^2$$

The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.



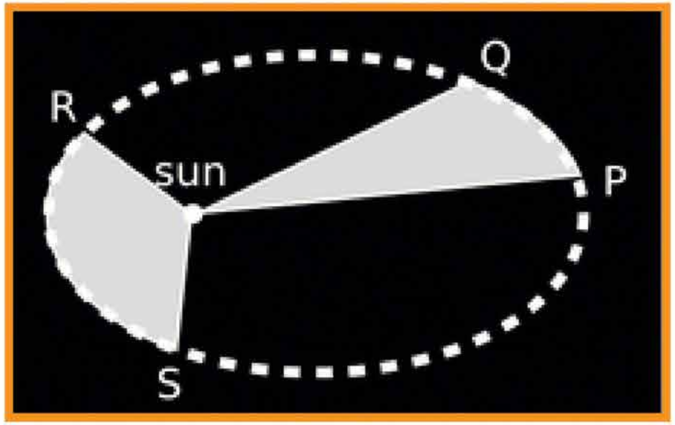
Since Greek times square numbers have been incorrectly identified with square geometries

Equilateral triangles also form square number geometries

Eutrigons

are an important new class of triangle (mathematically defined by Wayne Roberts), as the analogue of the right-triangle in orthogonal (Cartesian) coordinate geometry

Kepler's Second Law of planetary motion



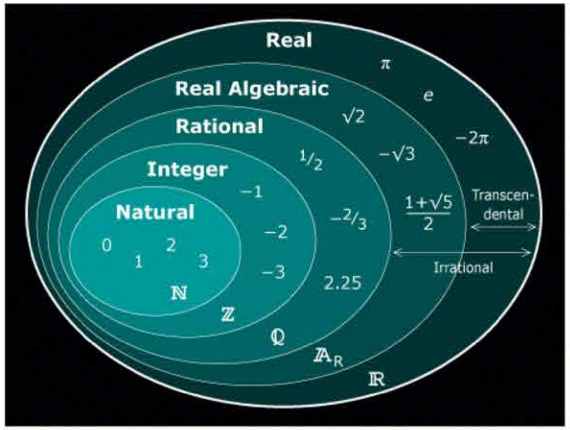
The orbit of every planet is an ellipse with the Sun at one of the two foci.

A line joining a planet and the Sun sweeps out equal areas during equal intervals of time.

The algebraic form of the Eutrigon Theorem, (like the algebraic form of Pythagoras' Theorem), is proven to be special case of the Cosine Rule...

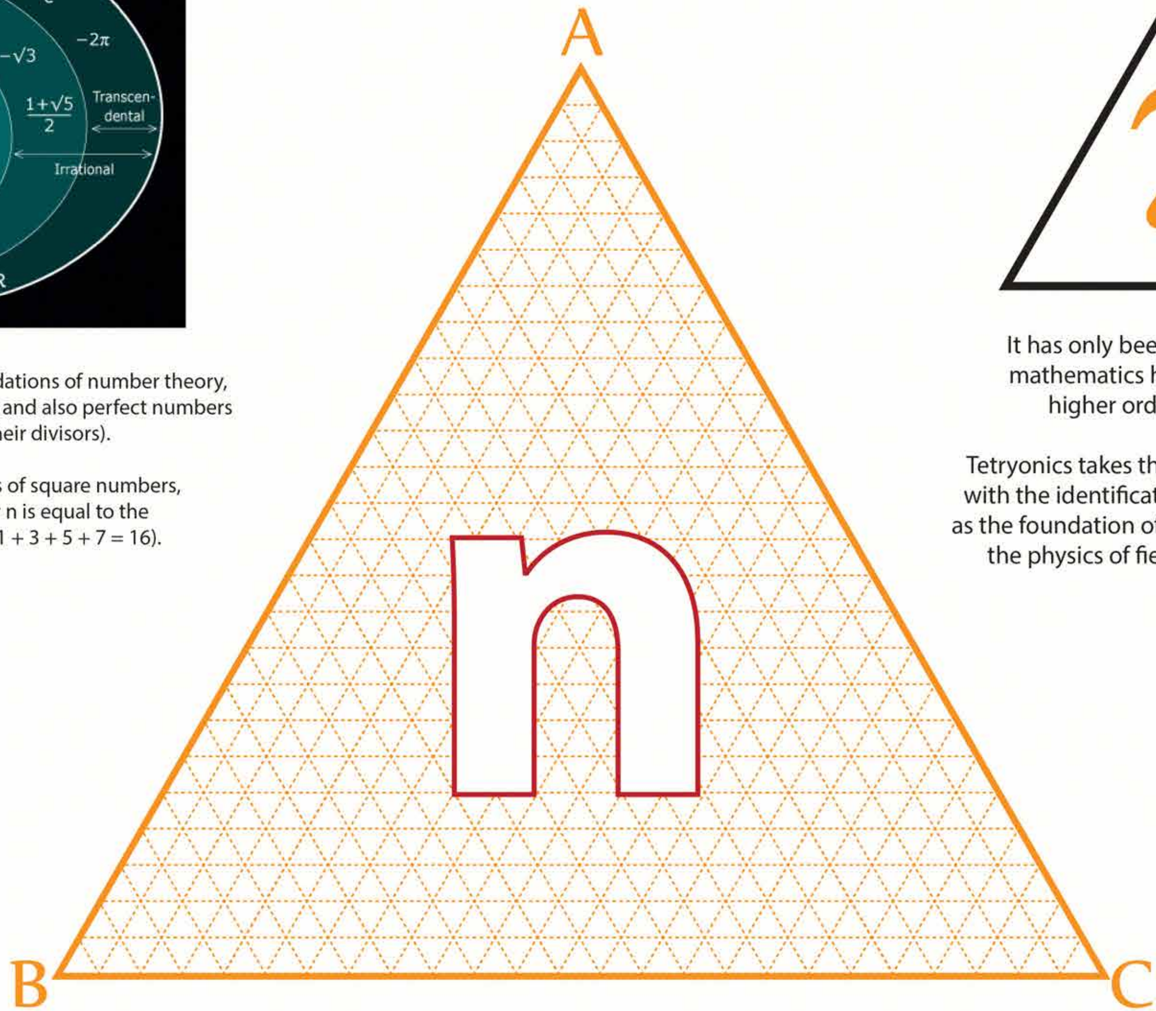
Tetryonic theory reveals the equilateral [square] energy geometry that reveals the 'harmonics at play' in physical laws such as the second law of Kepler, and in many other phenomena in physics, chemistry, cosmology, biochemistry and number theory thus providing the foundation for the mathematics of quantum mechanics

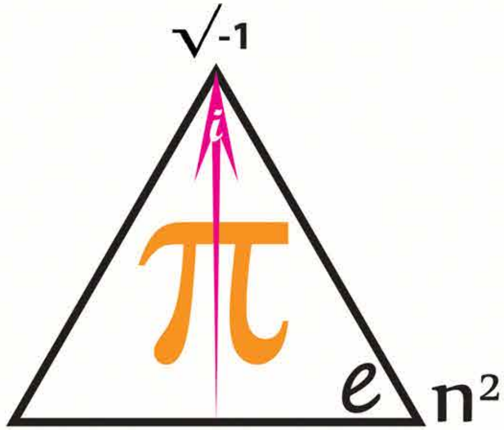
Number theory



The Pythagoreans also established the foundations of number theory, with their investigations of triangular, square and also perfect numbers (numbers that are the sum of their divisors).

They discovered several new properties of square numbers, such as that the square of a number n is equal to the sum of the first n odd numbers (e.g. 1 + 3 + 5 + 7 = 16).

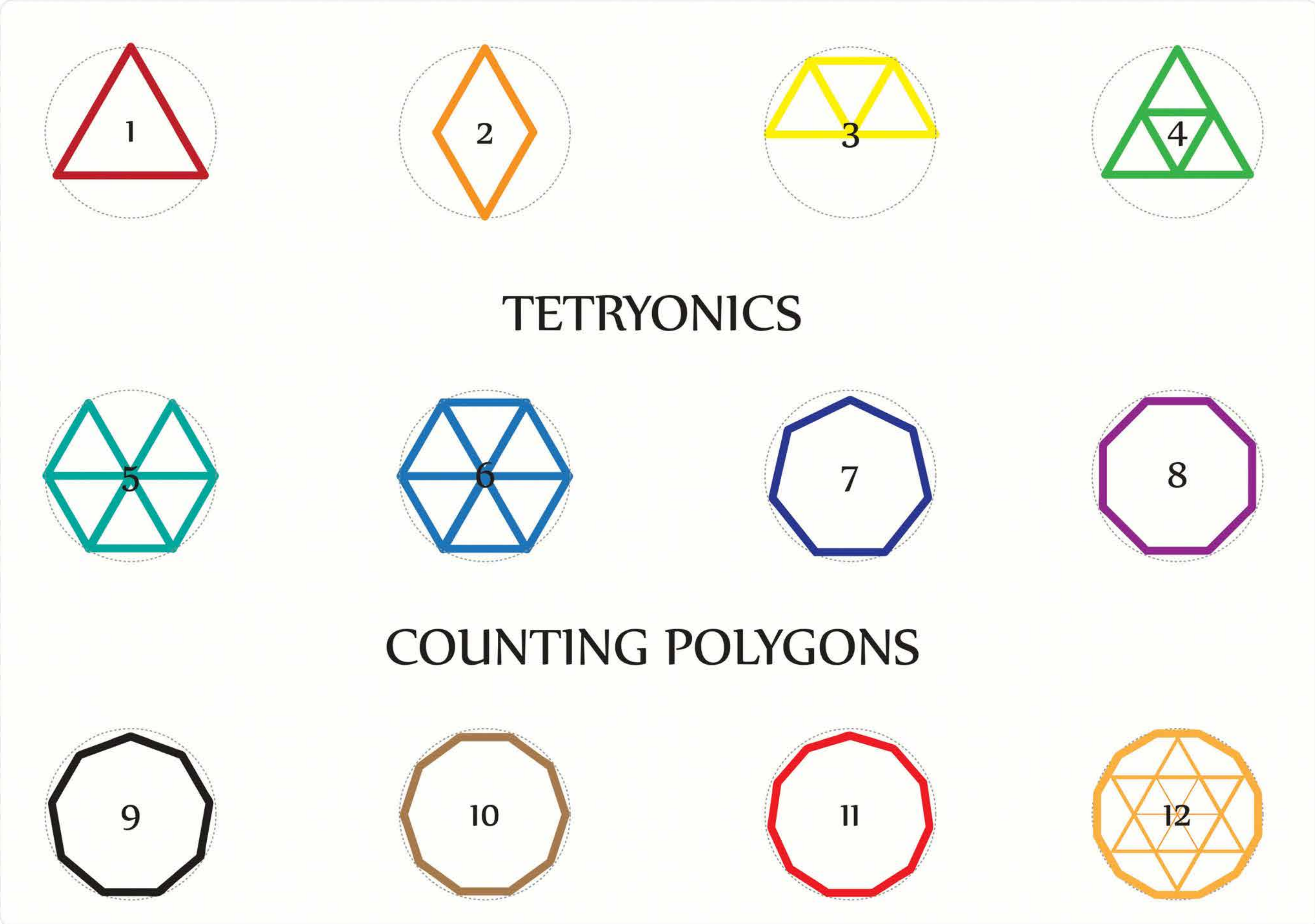




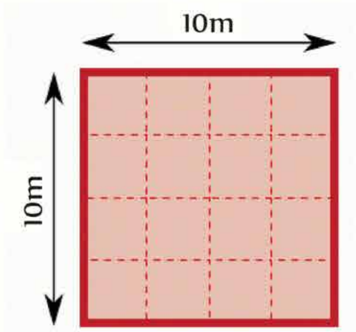
It has only been in recent centuries that mathematics has begun to explore the higher order irrational numbers

Tetryonics takes this investigation to new levels with the identification of equilateral geometries as the foundation of transcendental numbers and the physics of fields and particles in motion

What mathematics has failed to appreciate is the significance application of equilateral geometries to the 'square' numbers of physics and science in general


1
2
3
4
TETRYONICS
5
6
7
8
COUNTING POLYGONS
9
10
11
12

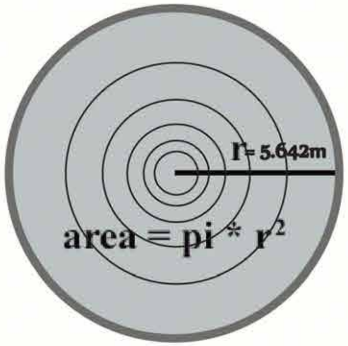
SQUARED energies in quantum mechanics are EQUILATERAL geometries



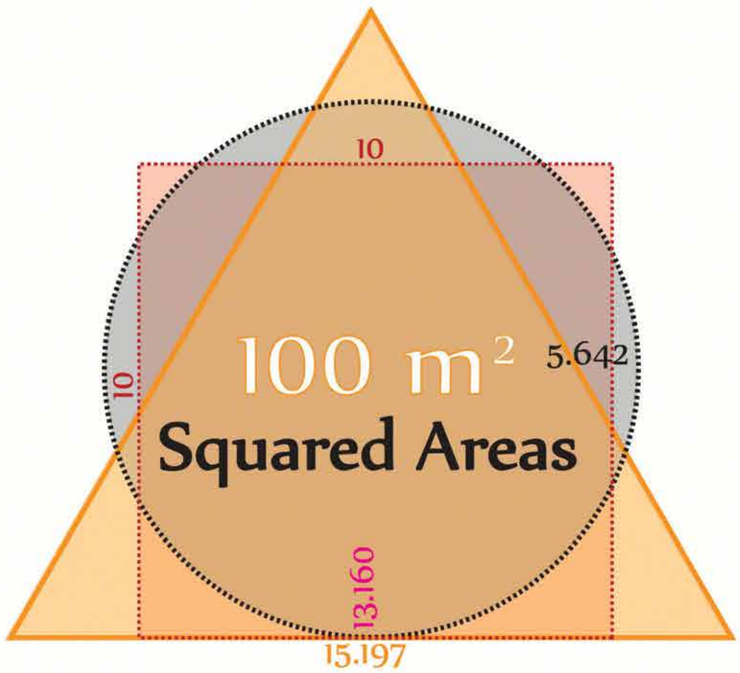
Square

area = s^2 = [100]

Circles



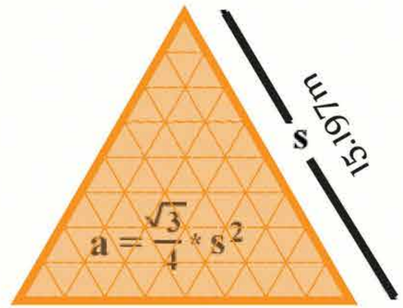
= pi *$[5.642]^2$
= 100



can be created by a number of planar geometries

*For a long time it has been assumed by scientists (and mathematicians) that circular [and squared] geometries are the geometric foundation of all physics, leading to a seriouls*y *flawed model of particles and forces in quantum mechanics*

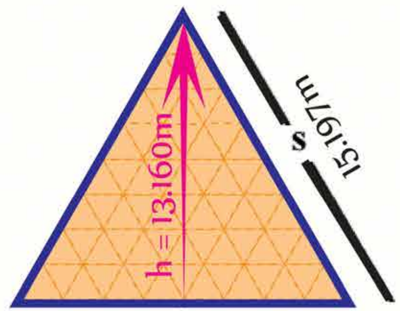
Tetryonic theory now reveals that quantised equilateral angular momenta creates the foundational geometry of all the mass-Energy-Matter & forces of physics



Equilateral

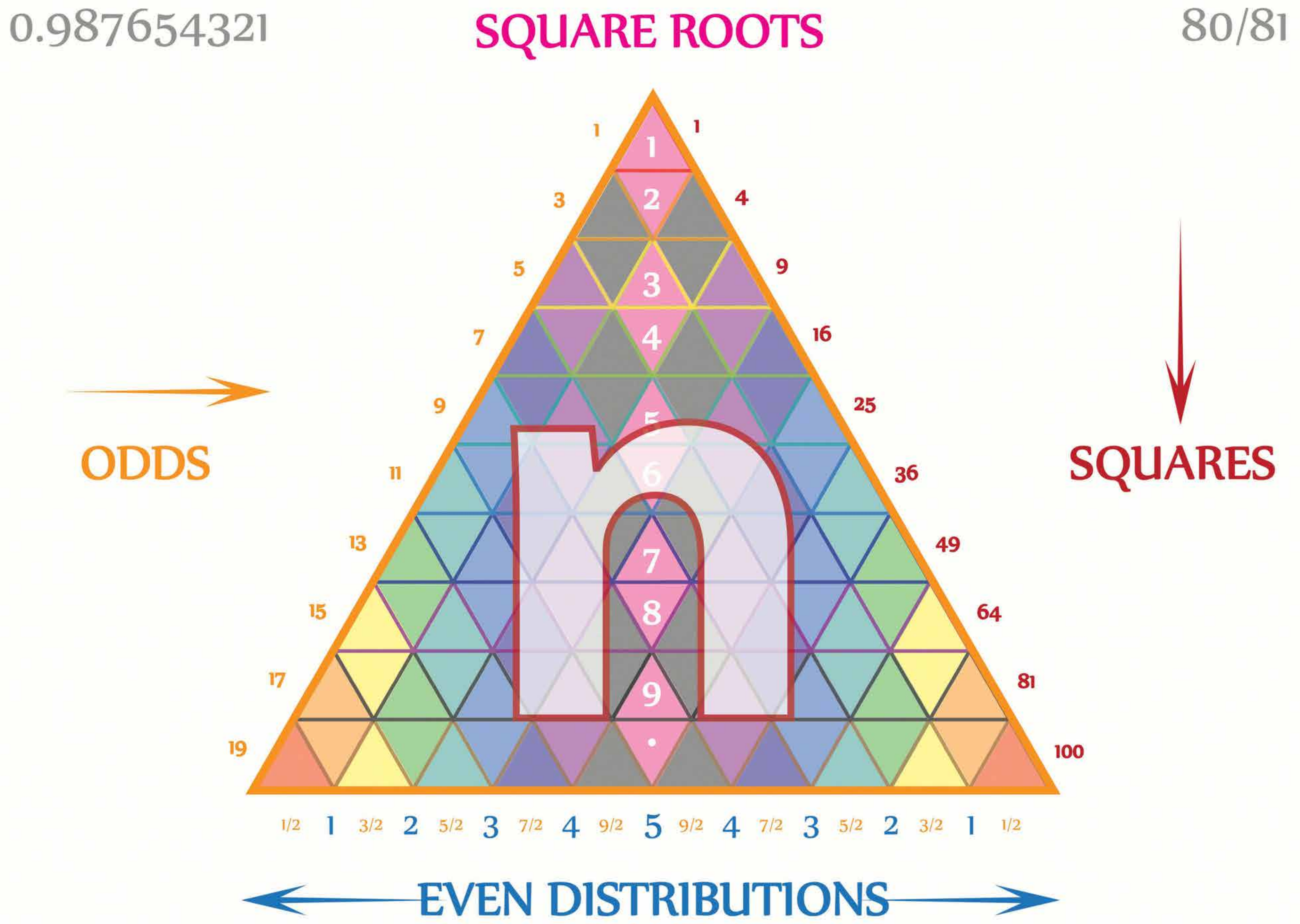
area = $(\frac{1}{2}*b)*h$

Triangles



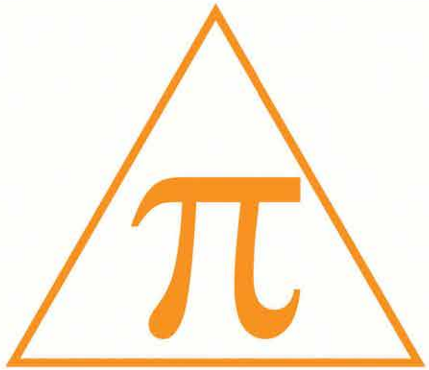
b

b h
[.5x15.197] x 13.160
= 100


0.987654321
SQUARE ROOTS
80/81
ODDS
SQUARES
1 3 5 7 9 11 13 15 17 19
1 4 9 16 25 36 49 64 81 100
1 2 3 4 5 6 7 8 9 •
n
1/2 1 3/2 2 5/2 3 7/2 4 9/2 5 9/2 4 7/2 3 5/2 2 3/2 1 1/2
EVEN DISTRIBUTIONS

Integers

The integers (from the Latin integer), literally "untouched", hence "whole"
in Tetryonics it is the basis for the Planck charge quantum

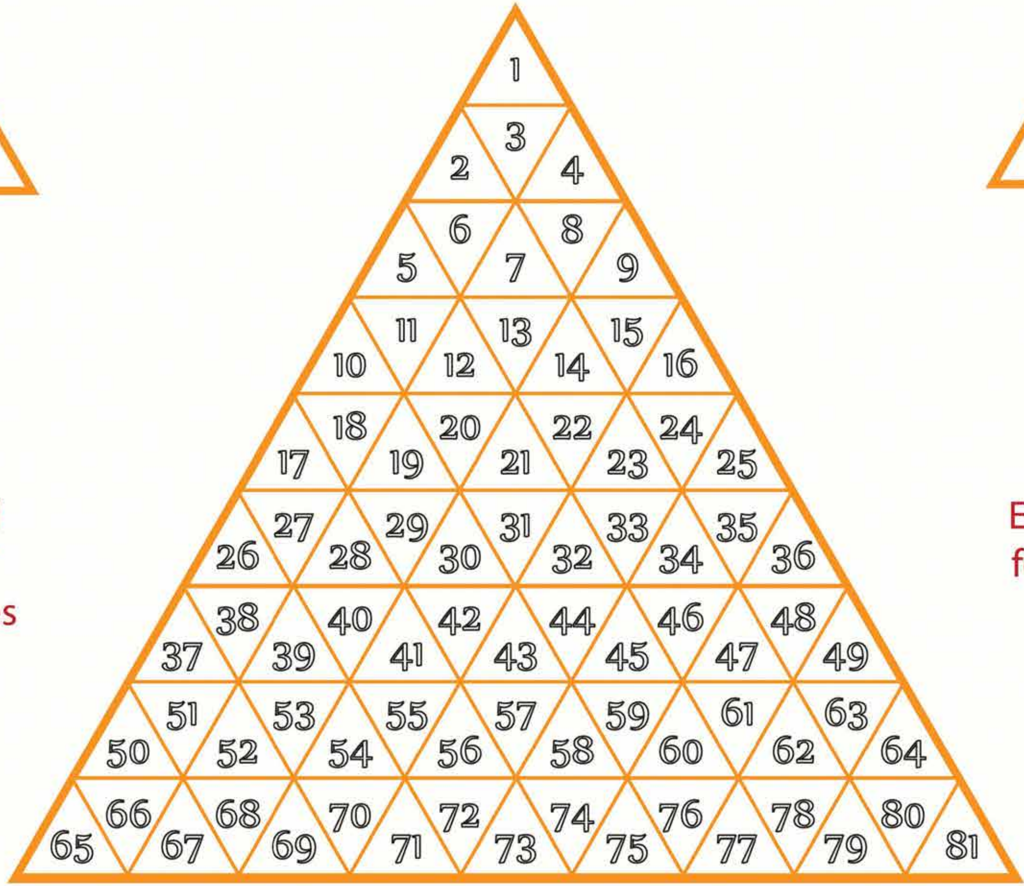


$$2n-1$$

$$[[n] + [n-1]]$$

Triangular numbered geometries are NOT equialteral geometries

0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...



$$\sum_{1}^{n} [2n-1]$$

Equilateral geometries form **SQUARE** number geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1

Equilateral energy quanta form a normal longitudinal distribution

Viewed as a subset of the real numbers, they are numbers that can be written without a fractional or decimal component

Bosons are a transverse measure of scalar energy momenta

ODD numbers

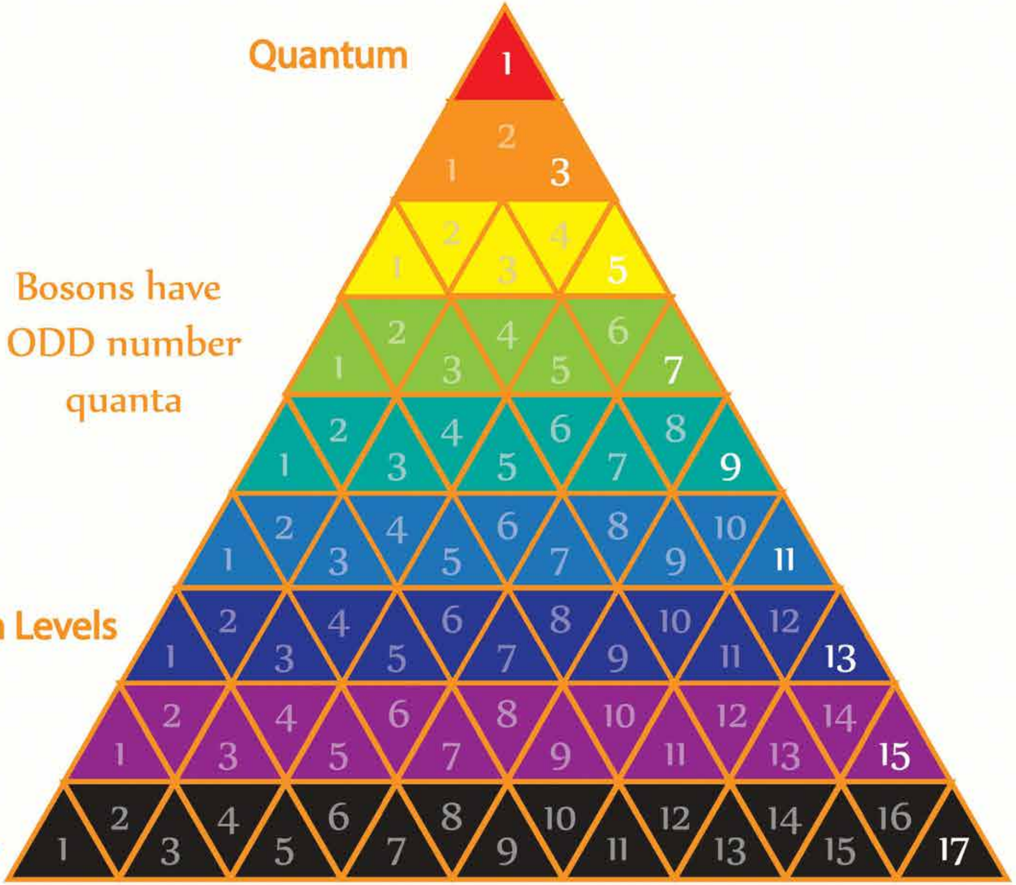
An odd number is an integer which is not a multiple of two.

Quantum

Bosons have ODD number quanta

Quantum Levels

$h\nu$



1

3

5

7

9

11

13

15

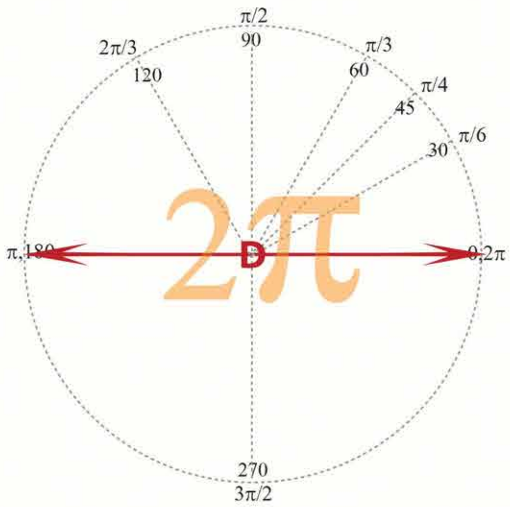
17

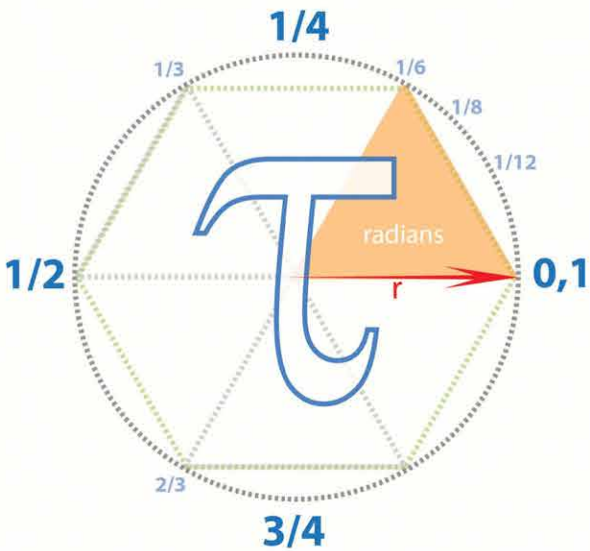
An odd number, when divided by two, will result in a fraction

Tau radians

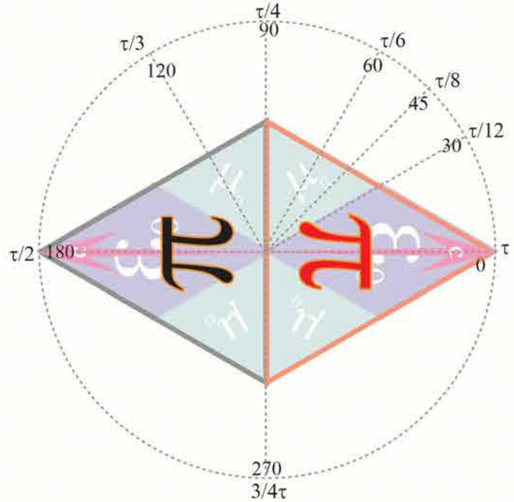
Around the whole outside of a circle,
there are about 6.283 radians - or, Tau radians

3.141592654

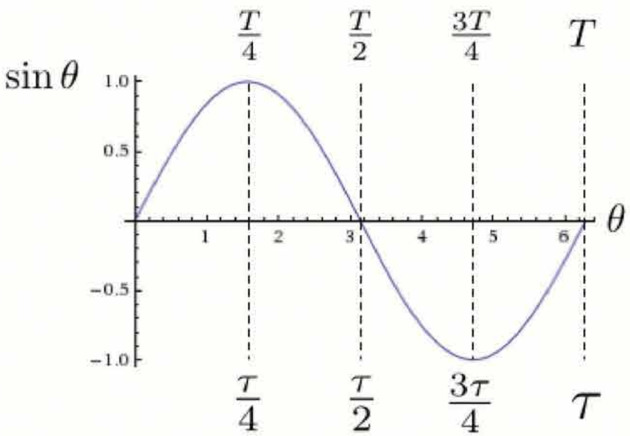




6.283185307



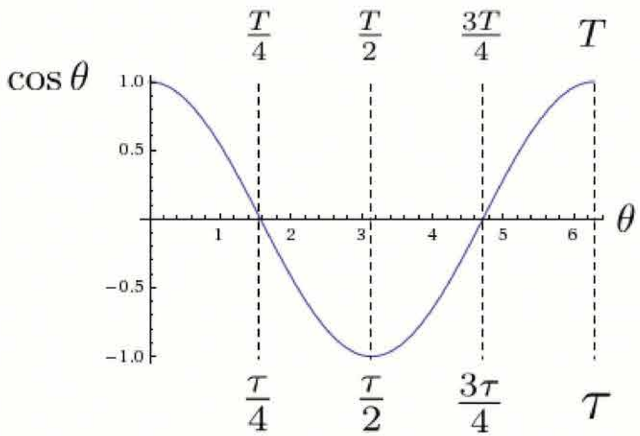
τ is a more 'natural' radian system for geometric physics than π
Tau = 2π = 360 degree rotation about a point



π
historically defined as the
ratio of a circle's circumference to its DIAMETER
should be redefined in physics to

τ
the ratio of its circumference to its RADIUS

in doing so many of the π/2 terms common to physics
will re automatically rationalised and will better reflect
the Tetryonic geometry of mass-ENERGY-Matter in motion

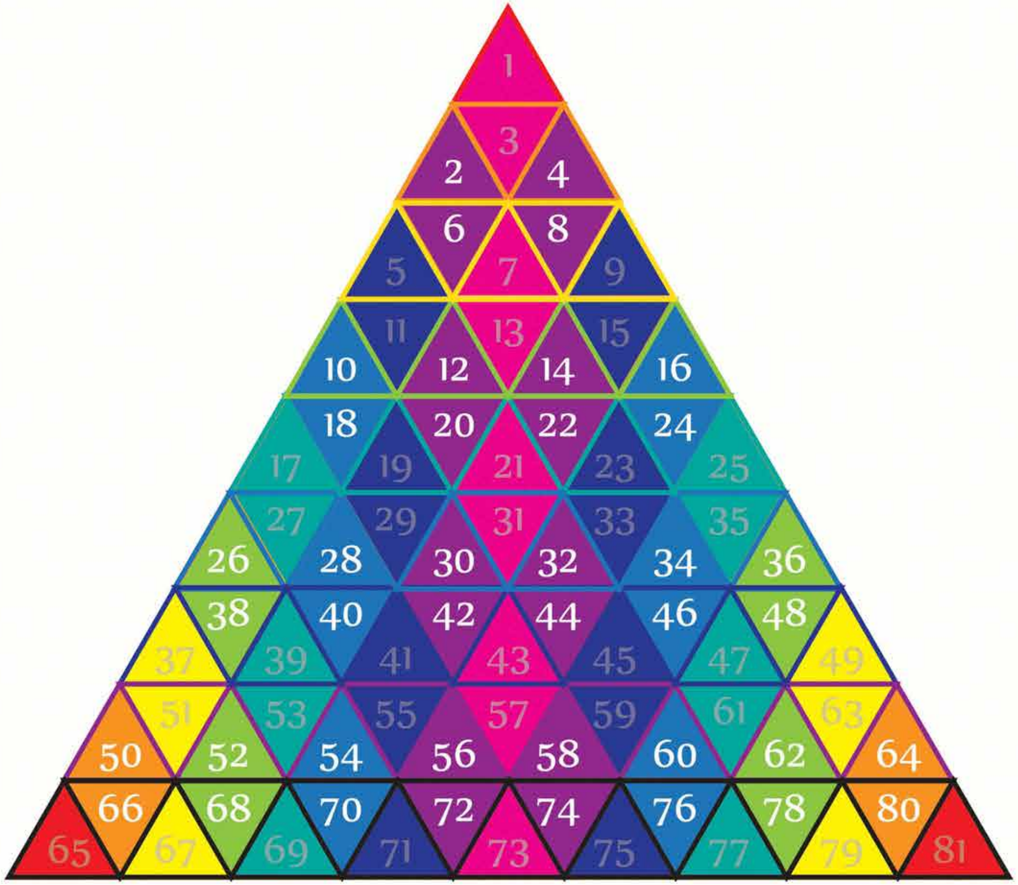


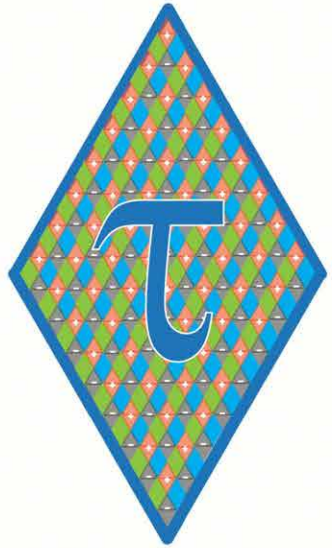
Photons are a longitudinal measure of scalar energy momenta

Photons are EVEN number quantums

EVEN numbers

An integer that is not an odd number is an even number



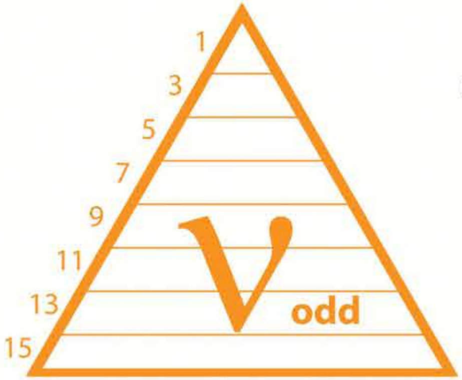


EM waves are comprised of EVEN numbered quanta

If an even number is divided by two, the result is another whole number

1/2 1 3/2 2 5/2 3 7/2 4 9/2 4 7/2 3 5/2 2 3/2 1 1/2

If an odd number is divided by two, the result is a fractional number

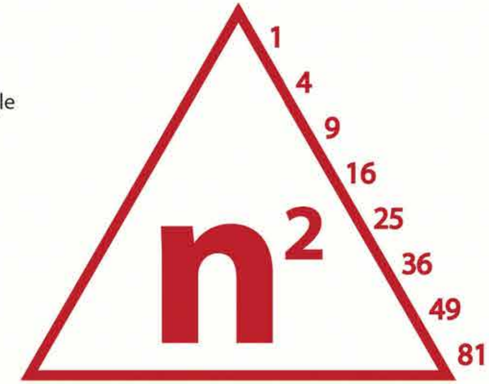


Triangular numbers

Historically, a triangular number counts quanta that can pack together to form an equilateral triangle

1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...

this form of geometric counting of same charges over-complicated the simpler physical reality

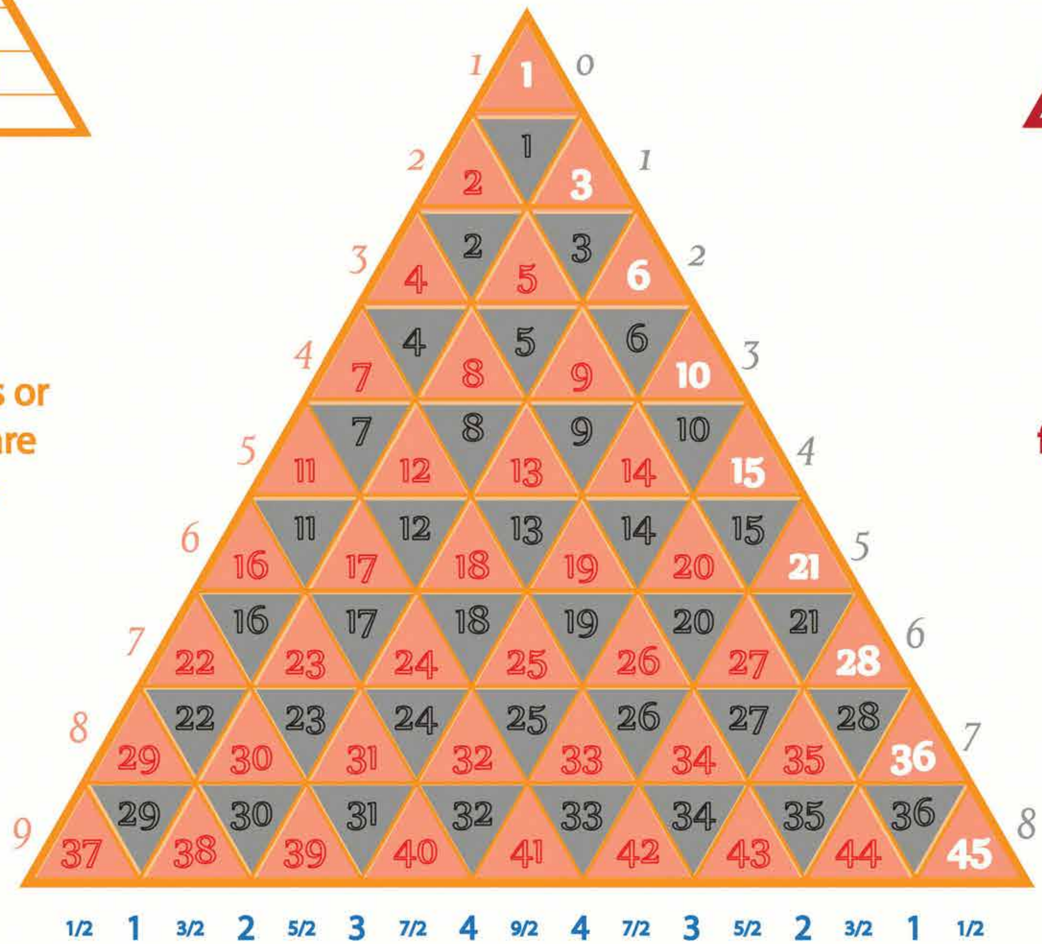


$$2\nu - 1$$

$$[\nu] + [\nu - 1]$$

Equilateral chords or quantum levels are ODD numbers

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,....



$$\sum_{1}^{n} [2n-1]$$

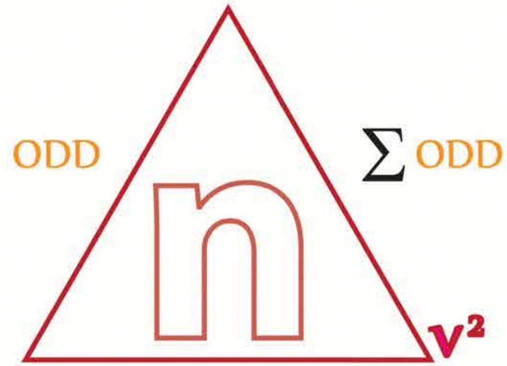
Equilateral geometries form SQUARE numbered geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

Triangular energy quanta form normal distributions

Squared numbers

A square number, sometimes also called a perfect square,
is the result of an integer multiplied by itself



1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17

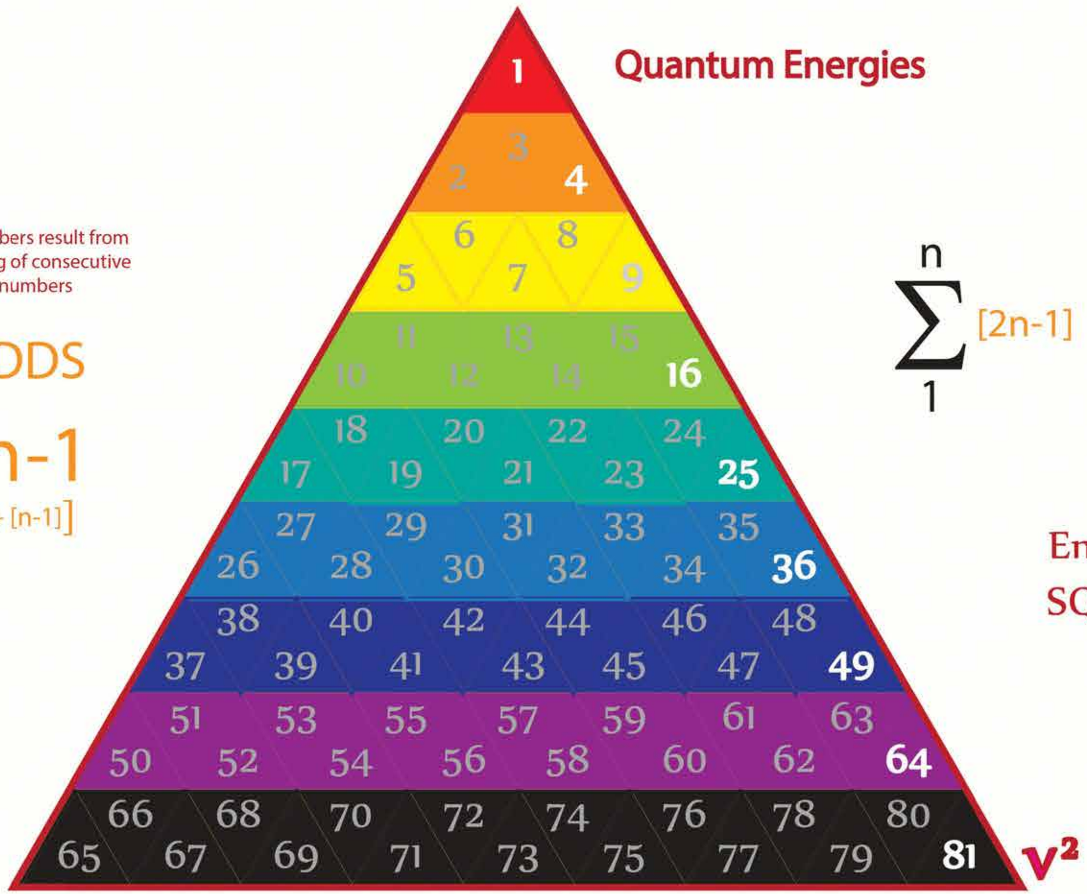
Square numbers result from the summing of consecutive ODD numbers

ODDS

2n-1

[[n] + [n-1]]

Quantum Energies



$$\sum_{1}^{n} [2n-1]$$

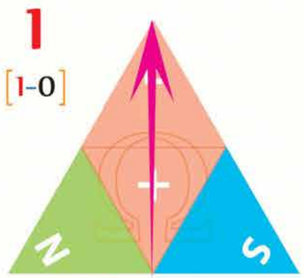
Energy levels have SQUARE number quanta

Compton Frequency

In Tetryonics Square numbers produce equilateral geometries

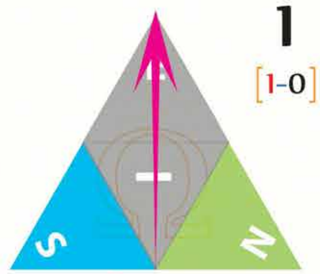
Square roots

A square root of a number is a number that, when it is multiplied by itself (squared) , gives the first number again.



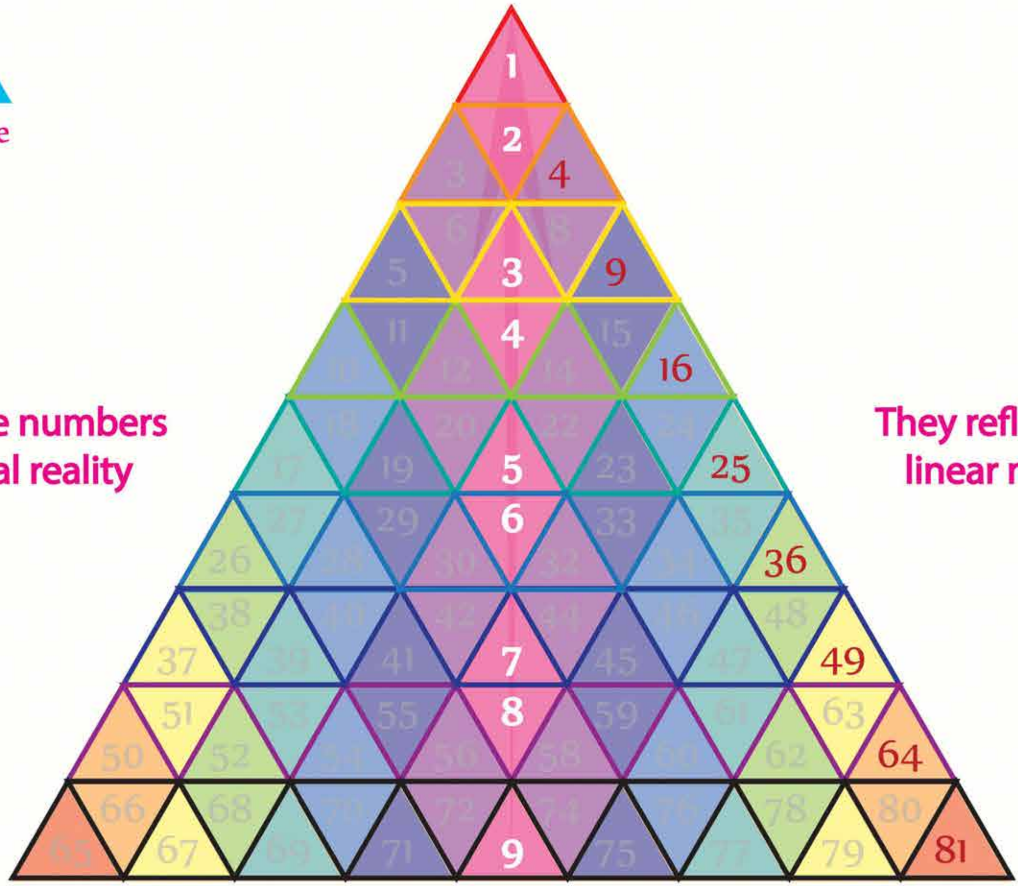
Root of positive one

-*i* and +*i*



Root of negative one

Square roots of negative numbers have a basis in physical reality

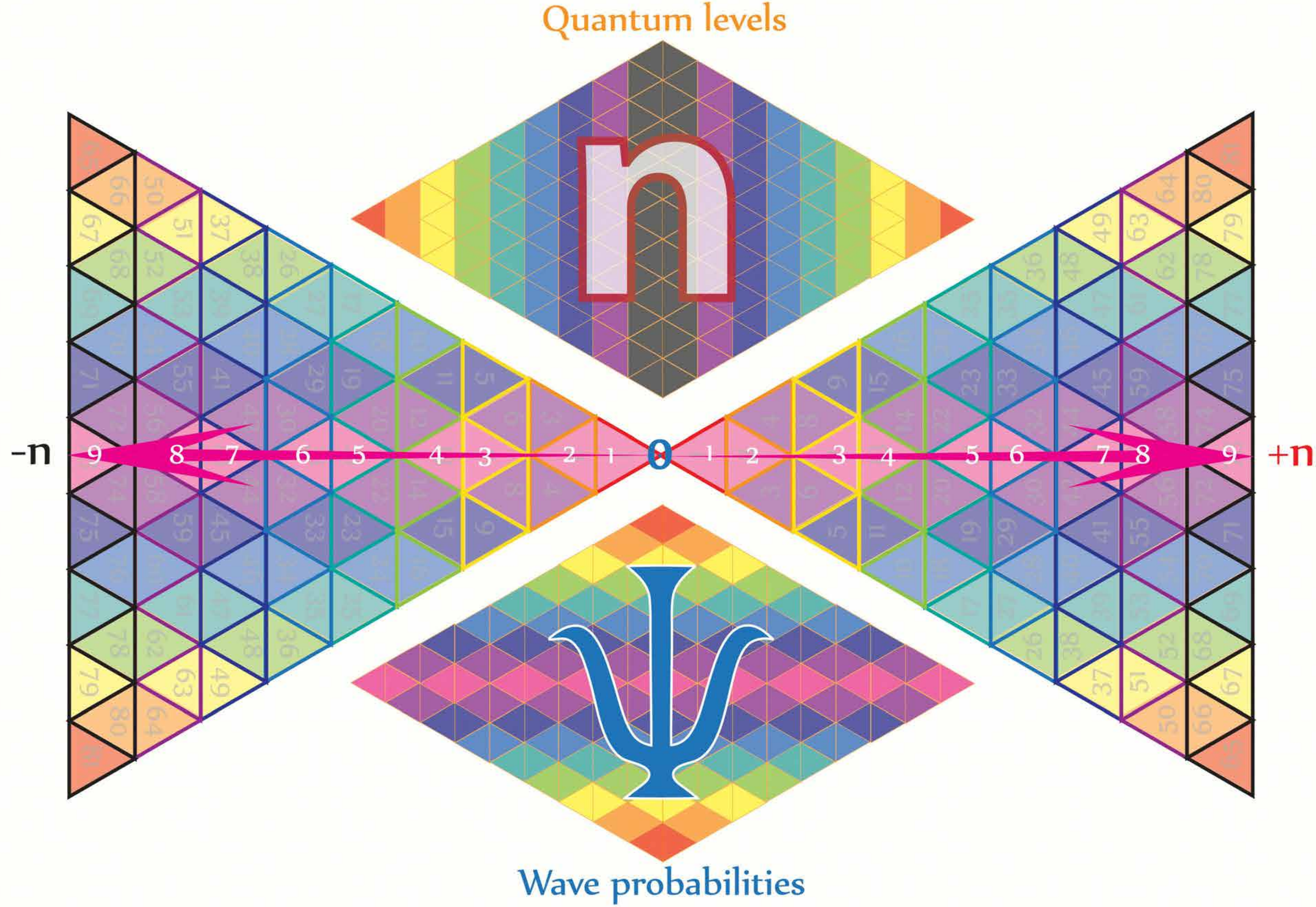


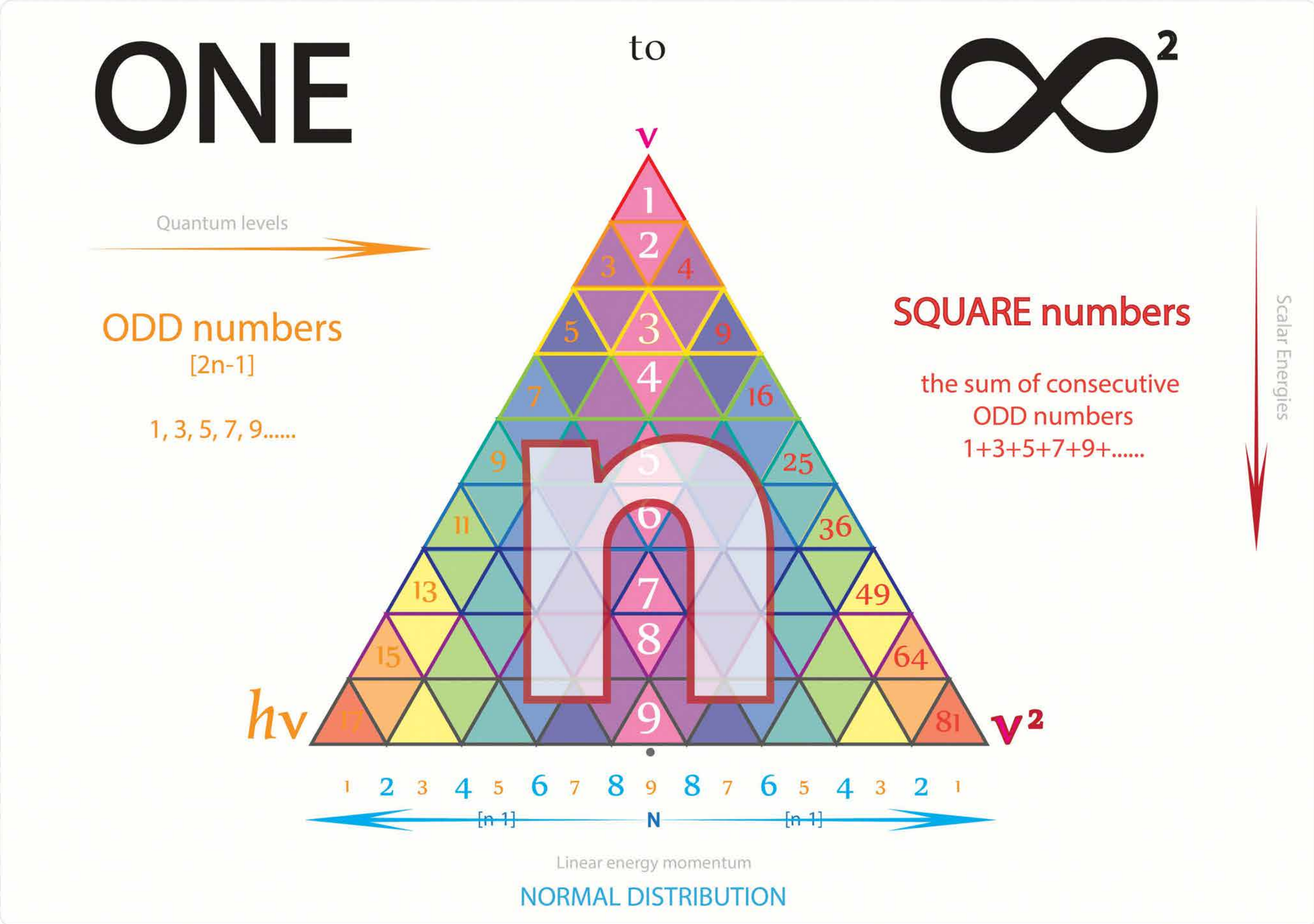
They reflect the real non-negative linear momentum of a system

A whole number with a square root that is also a whole number is called a perfect square in Tetryonic theory they are actually equilateral geometries

Real Numbers

In mathematics, a real number is a value that represents a quantity along a continuous line. The real numbers include all the rational numbers,




ONE
to
∞²
v
Quantum levels
ODD numbers
[2n-1]
1, 3, 5, 7, 9......
SQUARE numbers
the sum of consecutive
ODD numbers
1+3+5+7+9+......
Scalar Energies
1
2
3
4
3
5
9
4
7
16
9
25
11
36
13
49
15
64
17
81
5
6
7
8
9
n
hv
v²
1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1
[n-1]
N
[n-1]
Linear energy momentum
NORMAL DISTRIBUTION

Basic Properties of nested scribed Equilateral Triangles

Given an equilateral triangle of side s

altitude

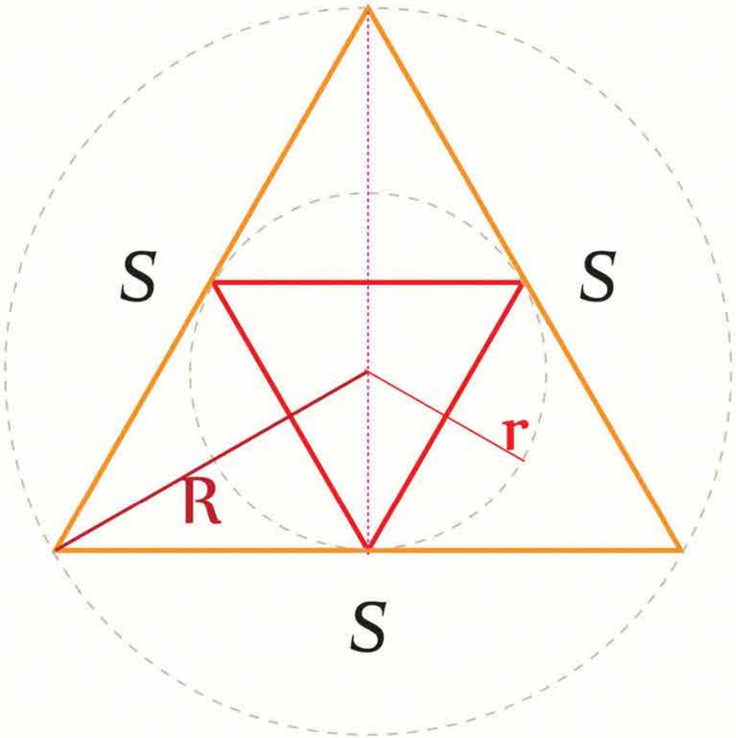
$\sqrt{3/2}\,S$

$3S$

perimeter

$\sqrt{3/4}\,S^2$

area



$\sqrt{3/6}\,S$

in-radius

$\sqrt{\pi/12}\,S^2$

in-circle area

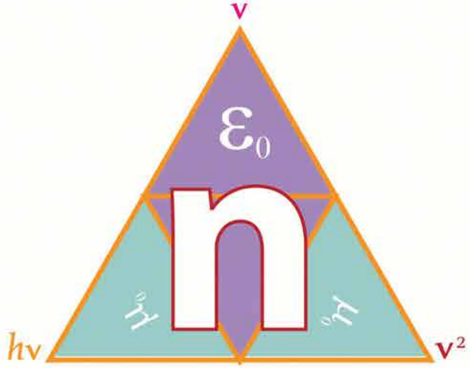
circum-radius

$\sqrt{3/3}\,S$

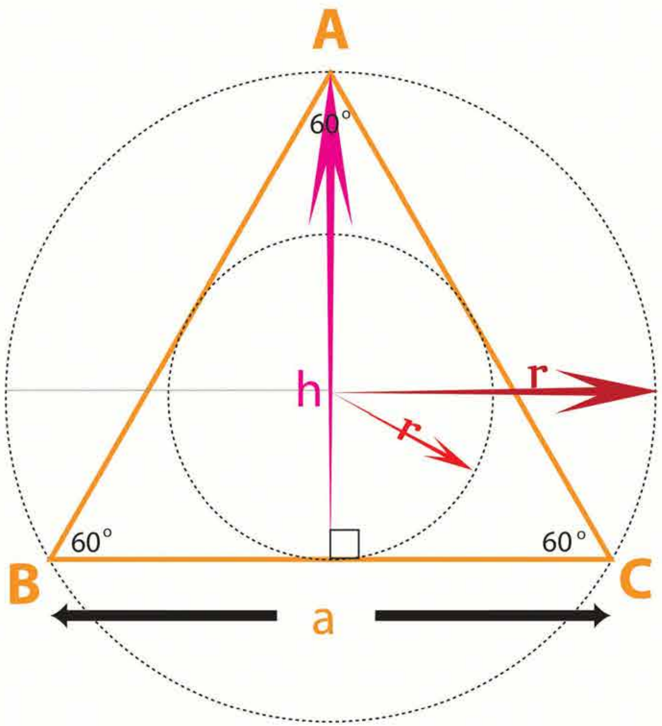
circum-circle area

$\sqrt{\pi/3}\,S^2$

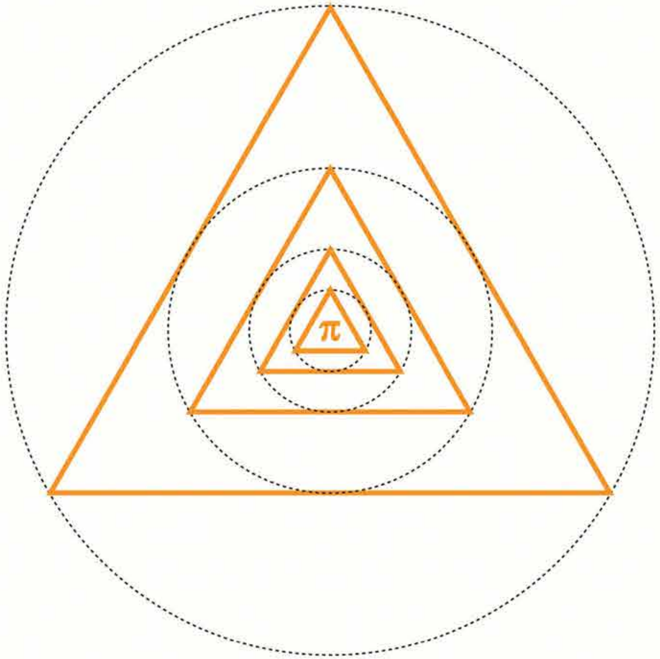
Tetryonic [equilateral] geometry

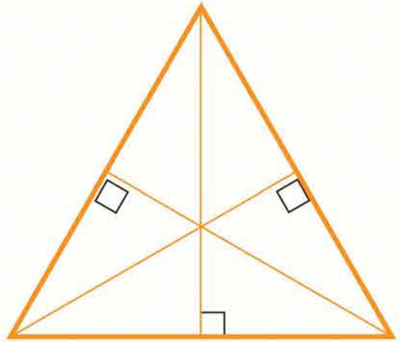


The equilateral triangle exhibits 'square symmetry'
it can always be divided into n^2 [number]
of smaller self-similar parts



All triangles are flat euclidean π radian geometries [180°]





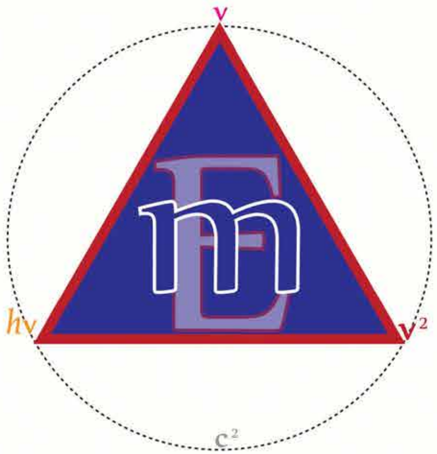
An equilateral triangle is the most symmetrical triangle,
having 3 lines of reflection and rotational symmetry of order 3 about its center

CHARGE

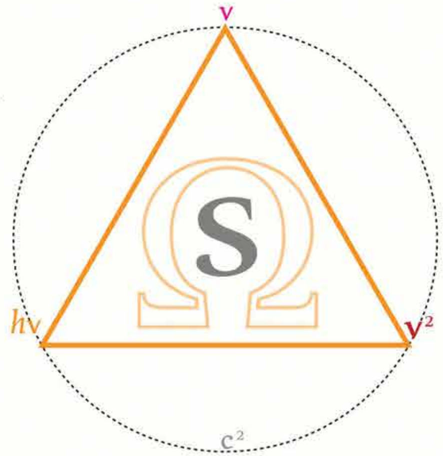
Scribed equilateral geometries

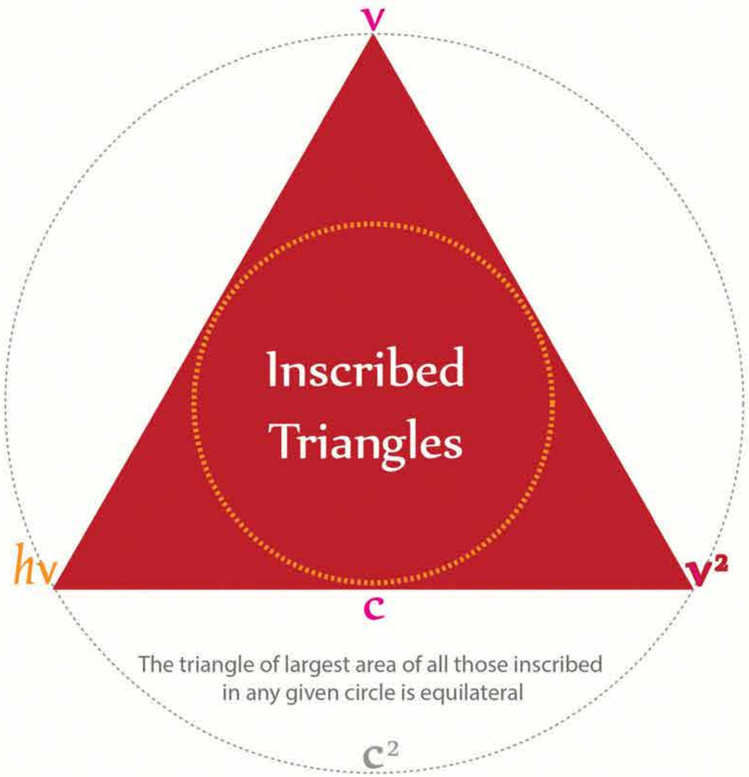
reflect space-time's geometric relationship with charged mass-energy

Energy



QAM





Energy per spatial unit

mass

QAM per spatial unit

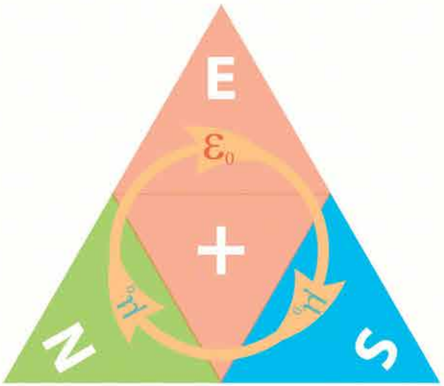
seconds

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

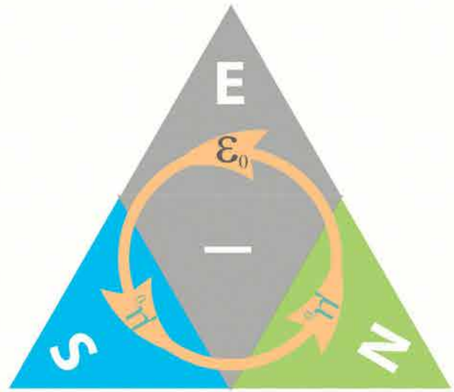
$$\frac{\Omega}{c^2} = s$$

Circumscribed Triangles

reflect Energy's relationship with Time



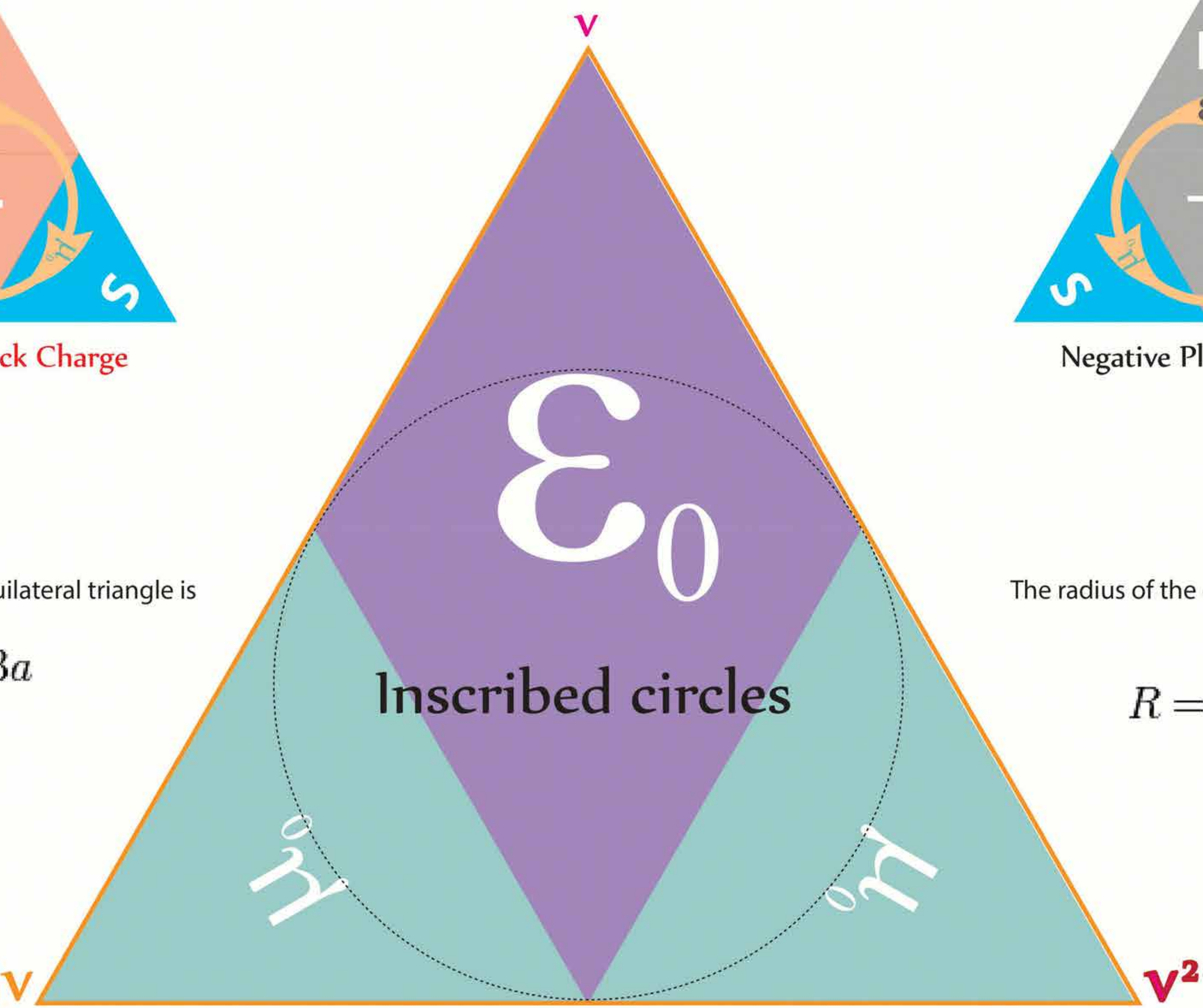
Positive Planck Charge



Negative Planck Charge

The perimiter of an equilateral triangle is

$$p = 3a$$



The radius of the circumscribed circle is

$$R = \frac{\sqrt{3}}{3}a$$

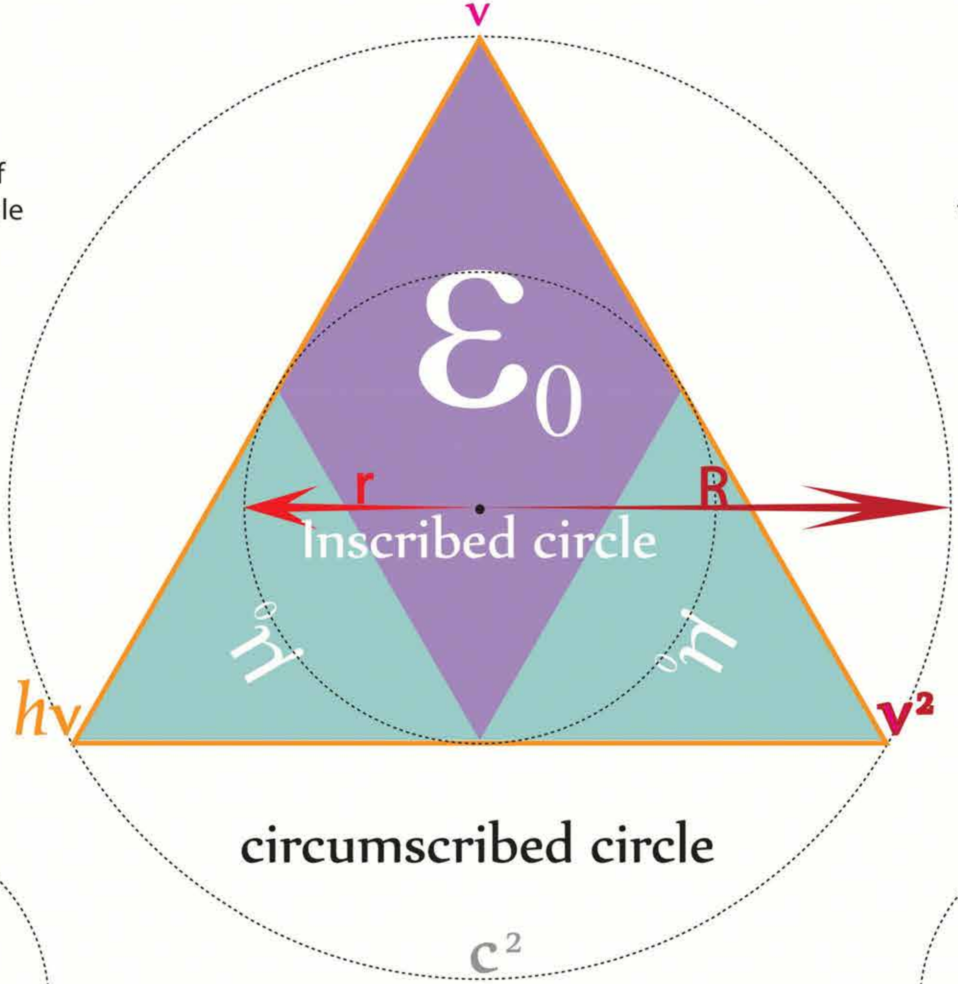
The equilateral triangle has the smallest area of all those circumscribed around a given circle

Circumscribed circles

By Euler's inequality, the equilateral triangle has the smallest ratio R/r of the circumradius to the inradius of any triangle: specifically, R/r = 2

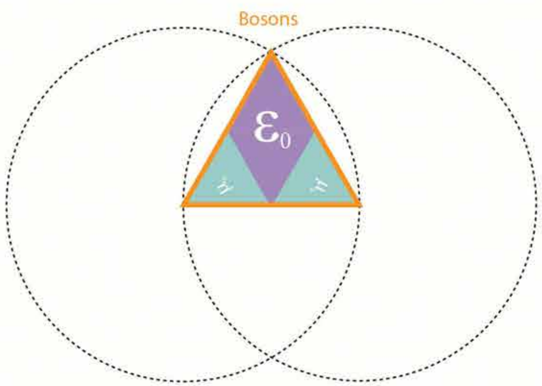
The ratio of the area to the square of the perimeter of an equilateral triangle

$$\frac{1}{12\sqrt{3}}$$

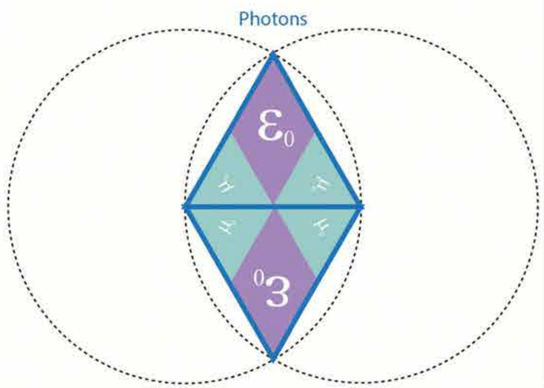


The ratio of the area of the incircle to the area of an equilateral triangle

$$\frac{\pi}{3\sqrt{3}}$$



Equilateral triangles and Tetrahedrons will scale at exactly the same proportion as Circles and Spheres scribing them



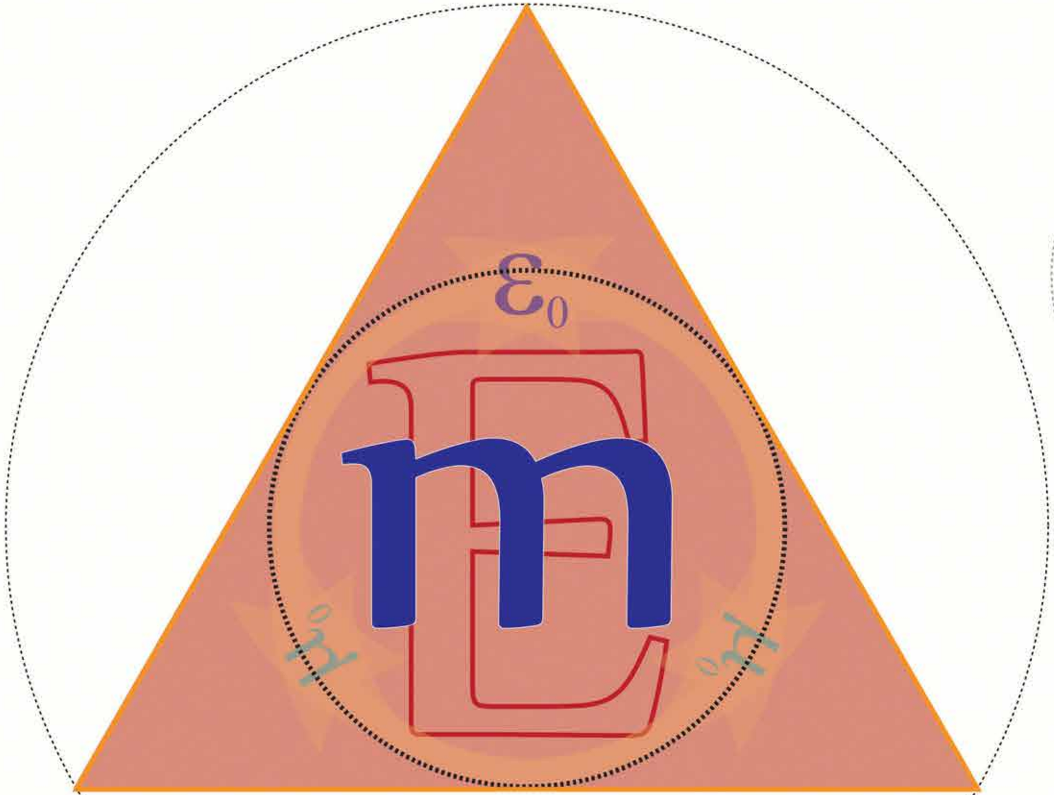
Charged mass-ENERGIES

Charge is the result of quantised angular momenta
[the inscribed circular flux of energy in equilateral geometries]

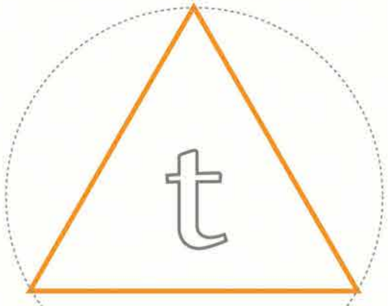
Time is a measure of changing quantised angular momenta
[the circumscribed spatial co-ordinate of equilateral energy geometries]

inscribed

charge



circumscribed



time

c^2

It is the equilateral geometry of energy not a classical vector rotation that creates QAM

Scalar EM mass is a measure of equilateral Planck energy per spatial co-ordinate system

m

Charged mass-energies can be described as a vector measure of scalar Energy momenta per unit of time
[inscribed circular fluxes of equilateral energy per circumscribed temporal geometry]

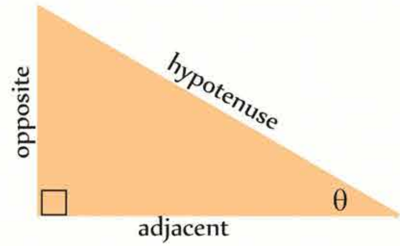
E

Trigometric functions

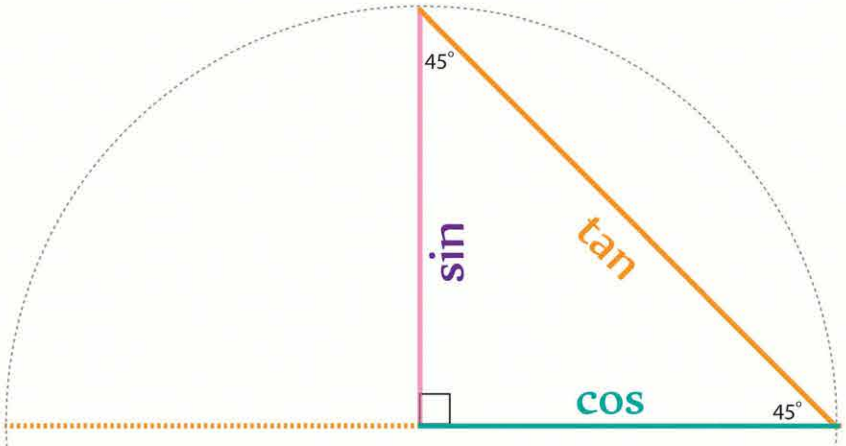
$$\sin\,\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos\,\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan\,\theta = \frac{\text{opposite}}{\text{adjacent}}$$



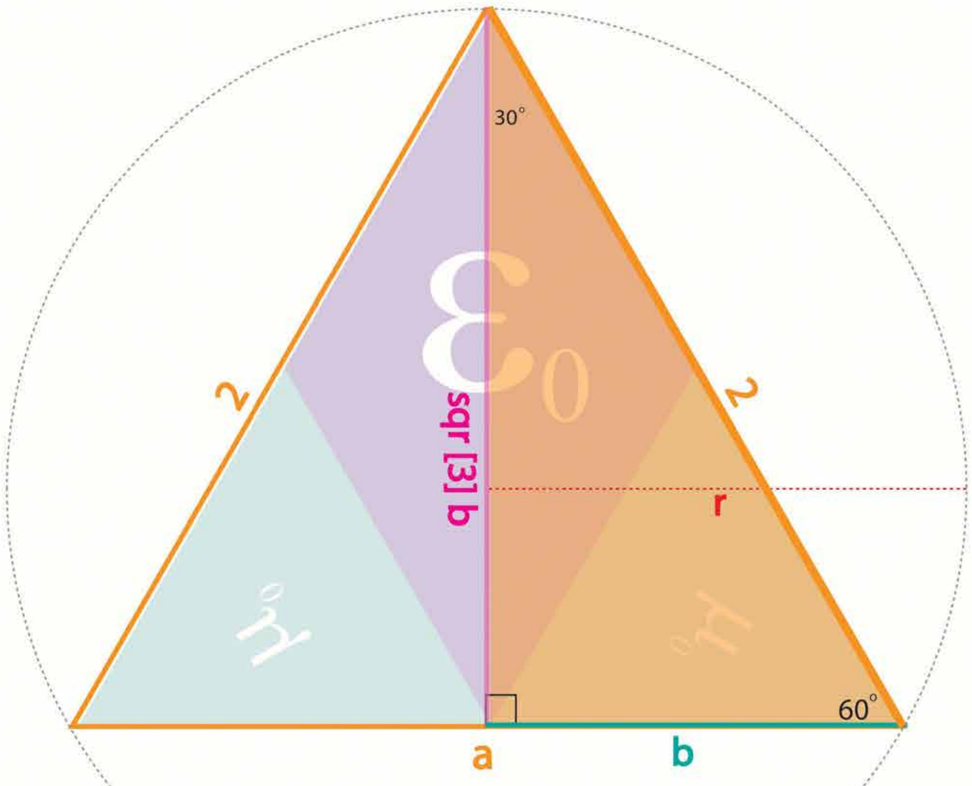
Standard trigometric functions must be carefully applied to measurements of equilateral Planck mass-energy geometries in scribed circular space-time co-ordinate systems



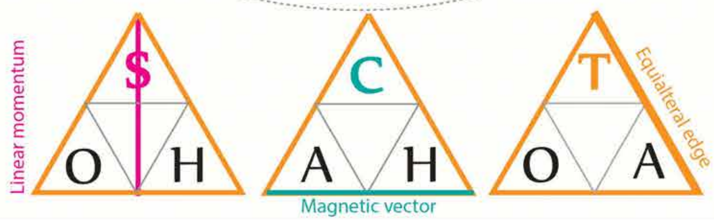
The most familiar trigonometric functions are the sine, cosine, and tangent.

In the context of the standard unit circle with radius 1, where a triangle is formed by a ray originating at the origin and making some angle with the x-axis,

the SINE of the angle gives the length of the y-component (rise) of the triangle, the COSINE gives the length of the x-component (run), and the TANGENT function gives the slope (y-component divided by the x-component)



In most cases it is in fact easier to ignore the trigonomteric functions and math and simpy draw their related equilateral geometries



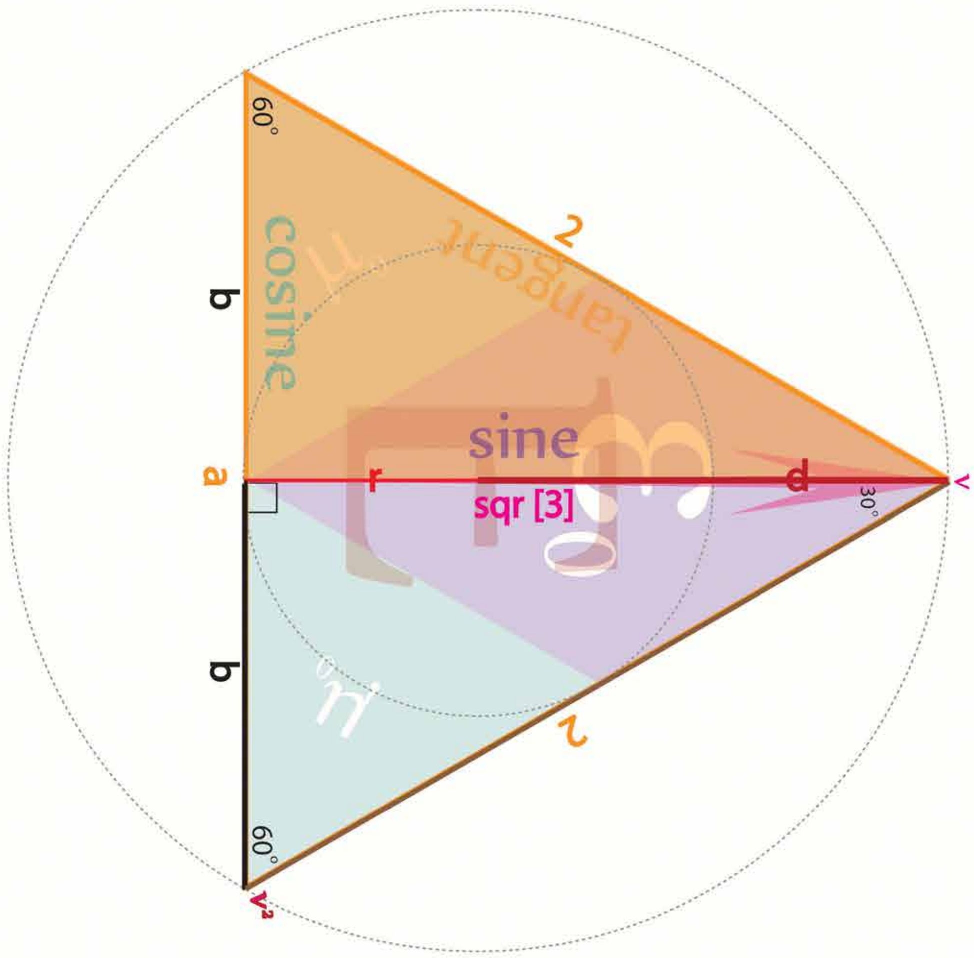
The roots of scribed equilateral triangles

Scalar equilateral energies map directly onto circular space-time co-ordinates
through their square root linear momentum

r

The ratio of the
circumscribed circle of
an equilateral triangle
to its inscribed circle
is 2:1

d



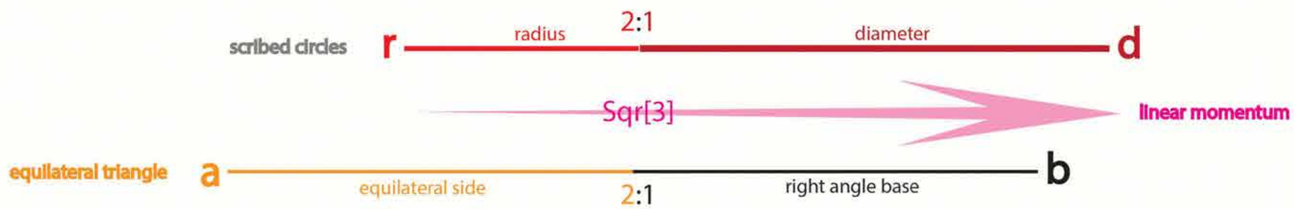
0.866 r

The ratio of the
side of an equilateral triangle
to the radius of
its incribed circle
is sqr [3]/2

a

The ratio of the
side of an equilateral triangle
to the radius of
its circumscribed circle
is sqr [3]

1.732 d



Equilateral triangles and scribed circles

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = \frac{1}{\sqrt{1-\beta^2}} = \frac{dt}{d\tau}$$

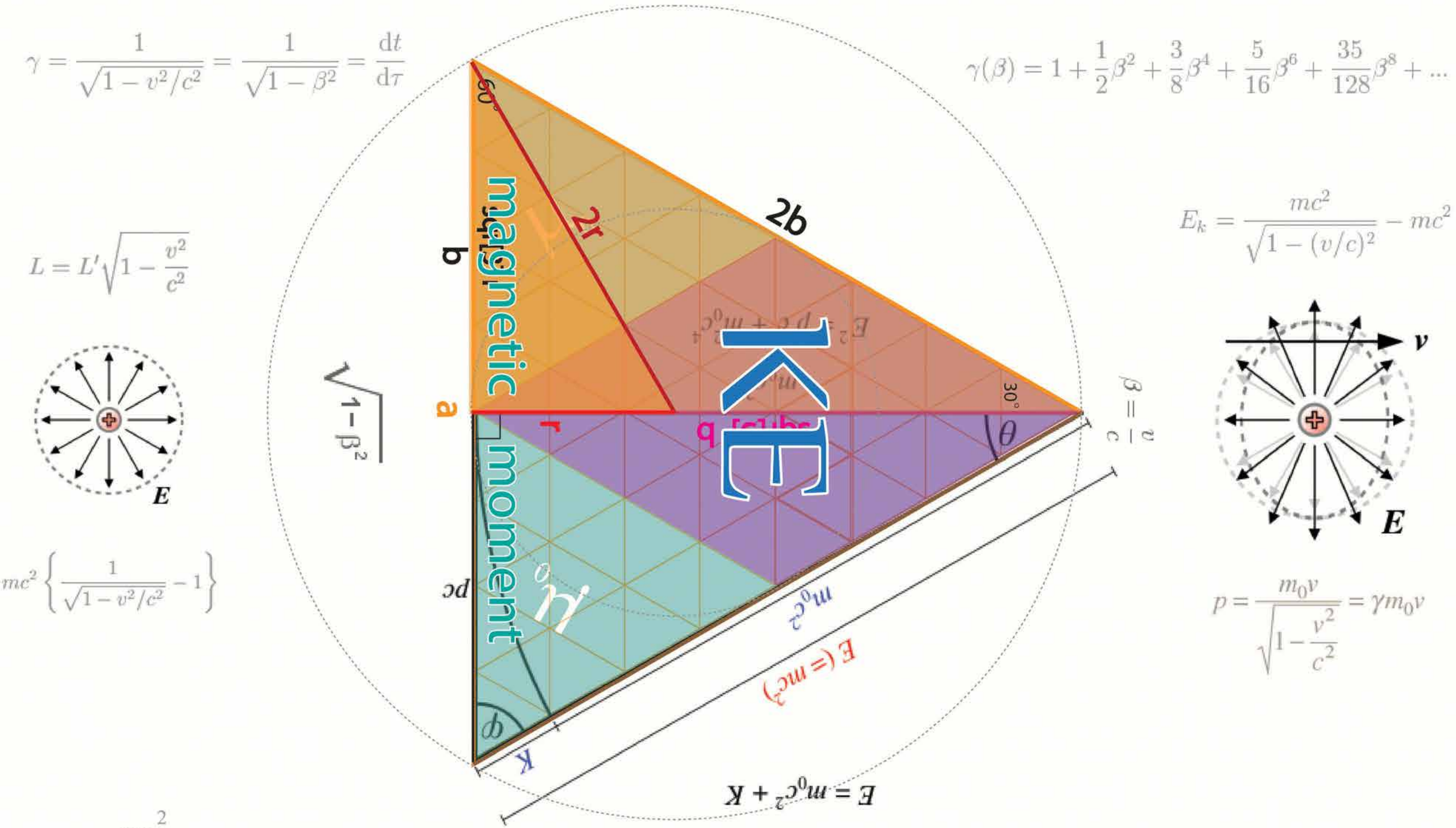
$$\gamma(\beta) = 1 + \frac{1}{2}\beta^2 + \frac{3}{8}\beta^4 + \frac{5}{16}\beta^6 + \frac{35}{128}\beta^8 + \ldots$$

$$L = L'\sqrt{1 - \frac{v^2}{c^2}}$$

$$E_k = \frac{mc^2}{\sqrt{1-(v/c)^2}} - mc^2$$

$$mc^2\left\{\frac{1}{\sqrt{1-v^2/c^2}} - 1\right\}$$

$$p = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}} = \gamma m_0 v$$



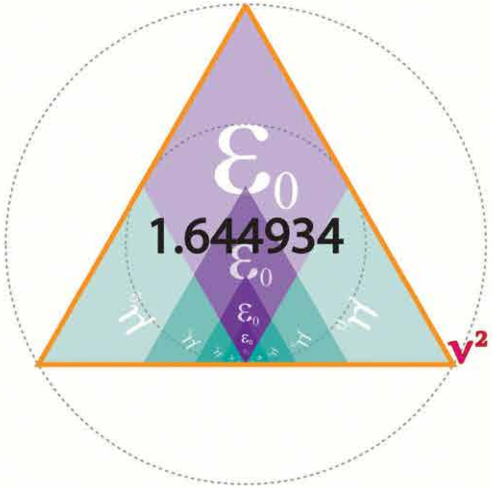
$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

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

All the relativistic relationships historically attributed to circularised energies and modelled through the use of the math of right angled triangles are in fact the result of equilateral, scalar geometries

Finite sequences and series have defined first and last terms,

$$\sum a_n = a_0 + a_1 + a_2$$



$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \lim_{n \to +\infty} \left(\frac{1}{1^2} + \frac{1}{2^2} + \cdots + \frac{1}{n^2} \right).$$

whereas infinite sequences and series continue indefinitely

The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

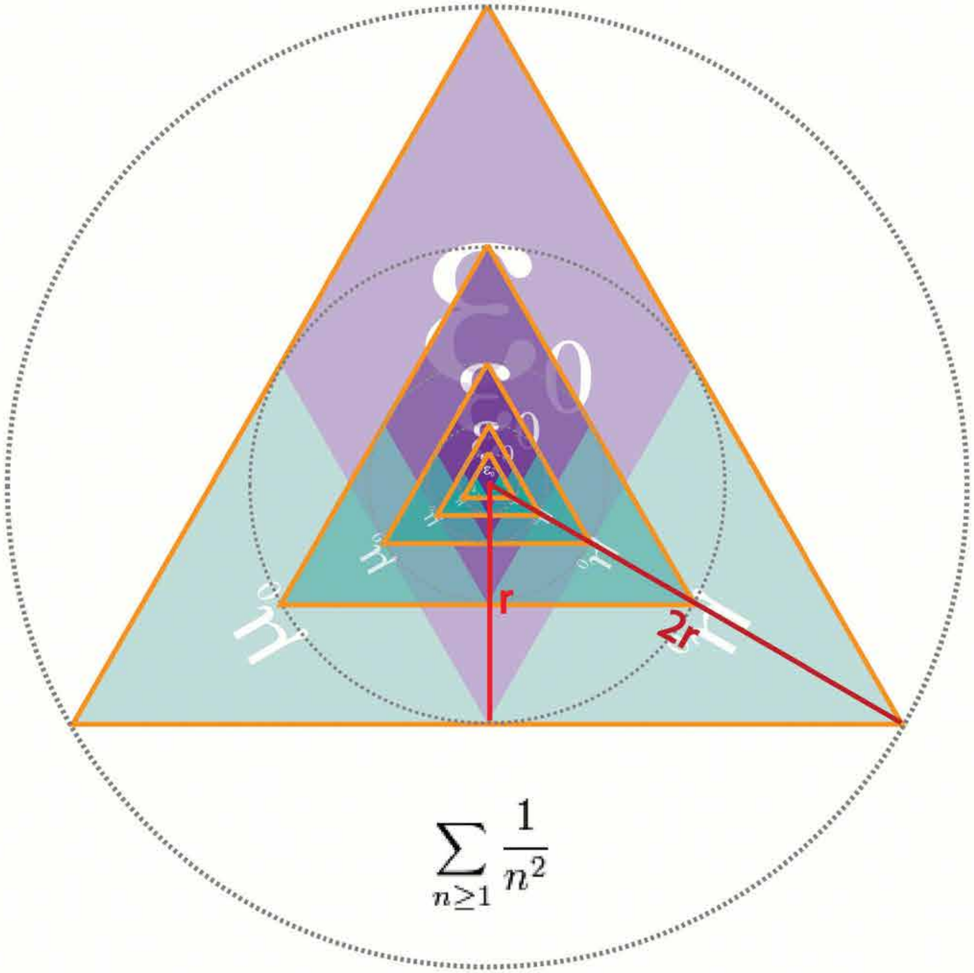
$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{6}$$

Tetryonics now provides a geometric solution to visualising and solving the Basel problem

$$\zeta(2) = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots = \frac{\pi^2}{6} \approx 1.645;$$

Tetryonic Infinite Series

is a infinite sequence of square numbers,
the result of adding all those terms together
[or their geometric inverse]



$$\sum_{n \geq 1} \frac{1}{n^2}$$

The entire sum of the series is equal to
twice the size of the radius of the largest inscribed circle
which is equal to the largest circle circumscribing the triangular series.

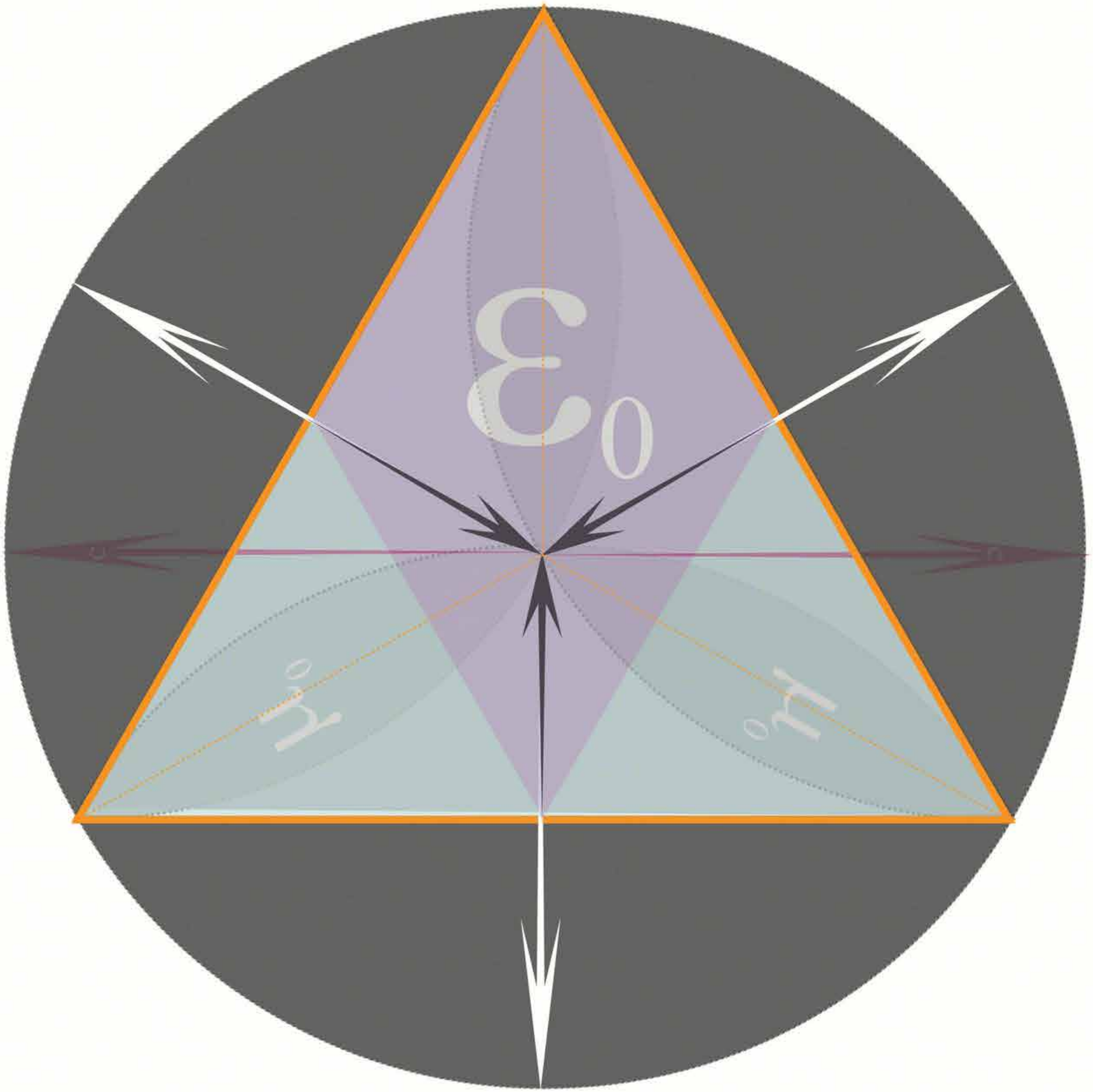
Inverting the Circle

Electric Permittivity

ε_o

Magnetic Permeability

μ_o



c^2

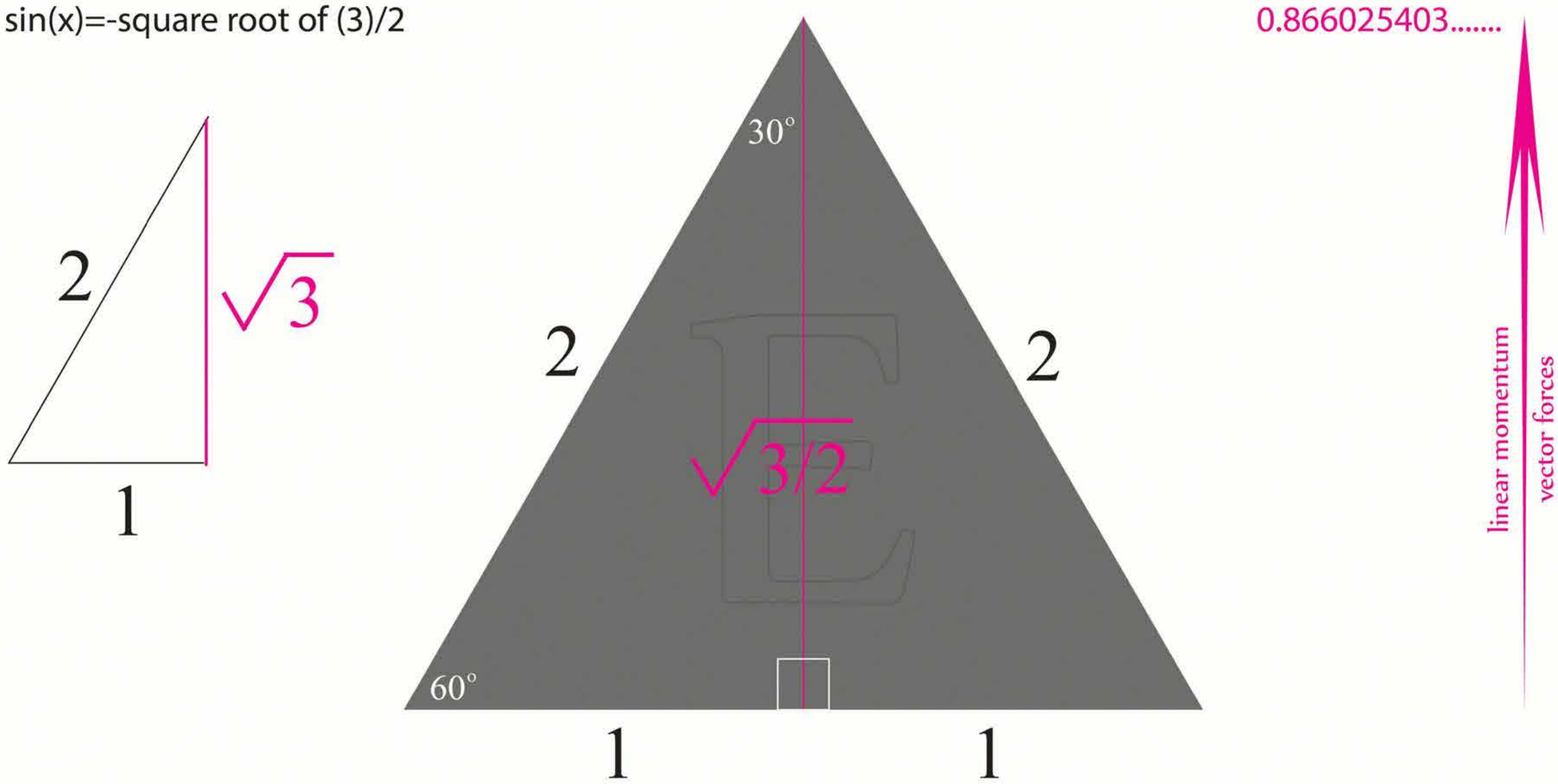
2D spatial co-ordinates

$\frac{1}{c^2}$

ElectroMagnetic fields

Irrational numbers

an irrational number cannot be represented as a simple fraction.
Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals

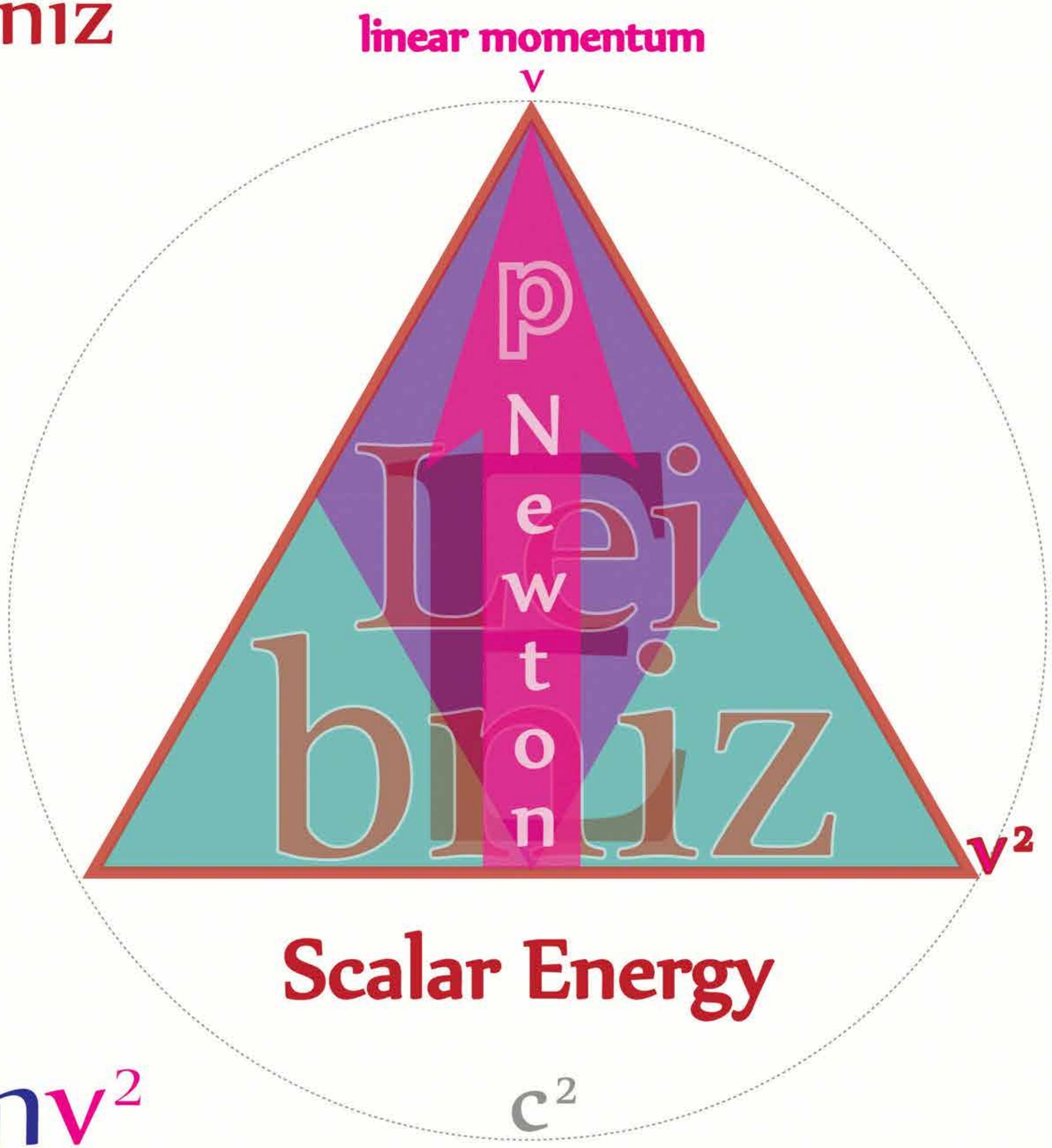


Pythagφras' theoreom
and irratiφnal numbers expressed in terms of right-angled triangles in Physics
offer a 'half truth' regarding the equilateral geometry of Energy

Leibniz

Leibniz introduced the concept of vis viva (living force) which attempted to quantify life force

$$E=mv^2$$



Newton

Newton focused his work on linear momentum which he developed into his famous laws of motion

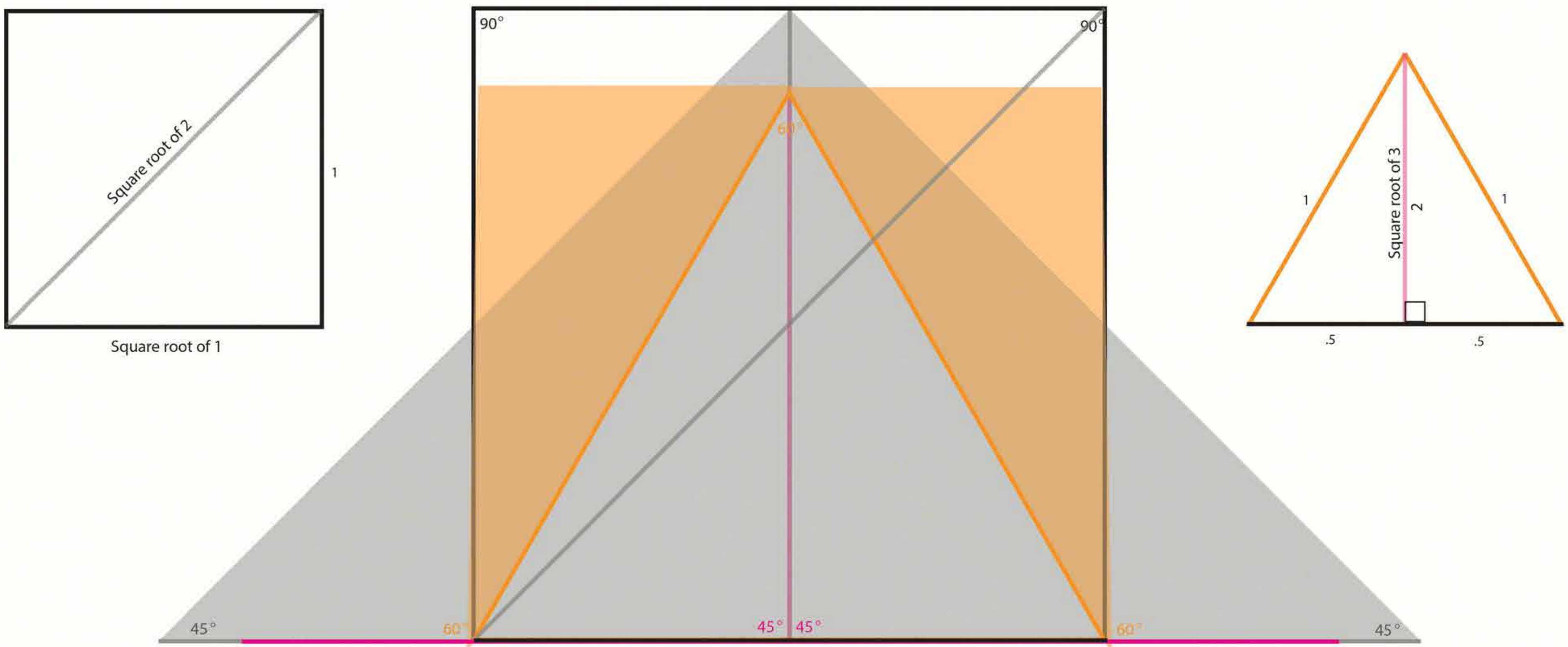
Newton and Leibniz disagreed about what the world is made of and how its physics shaped our scientific concepts of force, energy, and momentum

Tetryonics reveals the physical relationships they both described mathematically as geometric properties of equilateral Planck energy momenta

$$p=mv$$

Geometric Square Roots

In geometrical terms, the square root function maps the area of a square to its side length.



"In mathematics, as in any scientific research, we find two tendencies present. On the one hand, the tendency toward abstraction seeks to crystallize the logical relations inherent in the maze of material that is being studied, and to correlate the material in a systematic and orderly manner. On the other hand, the tendency toward intuitive understanding fosters a more immediate grasp of the objects one studies, a live rapport with them, so to speak, which stresses the concrete meaning of their relations"

Square root of 1

Square root of 2

Square root of 3

"As to geometry, in particular, the abstract tendency has here led to the magnificent systematic theories of Algebraic Geometry, of Riemannian Geometry, and of Topology; these theories make extensive use of abstract reasoning and symbolic calculation in the sense of algebra.

Notwithstanding this, it is still as true today as it ever was that intuitive understanding plays a major role in geometry. And such concrete intuition is of great value not only for the research worker, but also for anyone who wishes to study and appreciate the results of research in geometry"

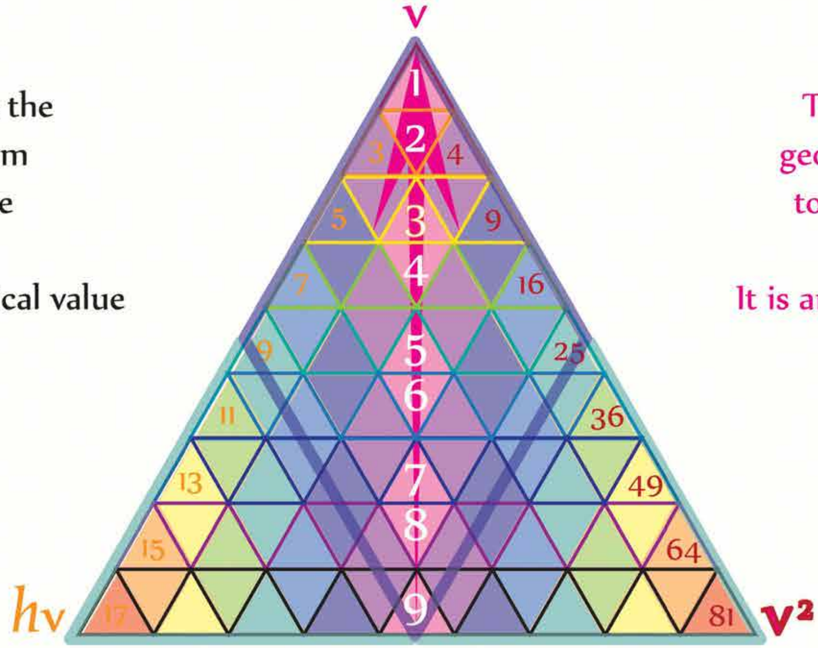
David Hilbert [Geometry and the Imagination]

Square Roots in Physics

In mathematics, a square root of a number a is a number [n] such that [n]2 = x,
or, in other words, a number [n] whose square (the result of multiplying the number by itself, or [n × n]) is x.

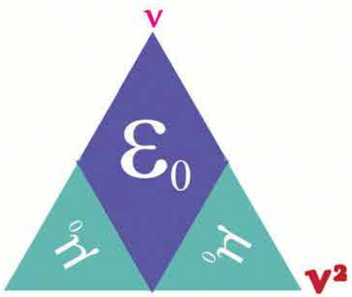
Modern calculators use the Square Root Algorithm to calculate the value

It is an approximate numerical value



Tetryonics uses the geometric Square Root to calculate the value

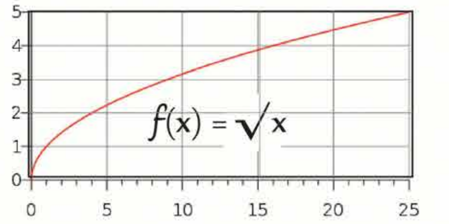
It is an exact geometric value



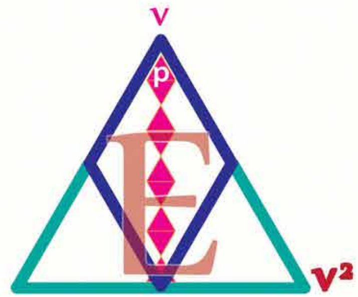
$$E = mv^2$$

In classical geometry, the square root function maps the area of a square to its side length.

$$p = \sqrt{E}$$

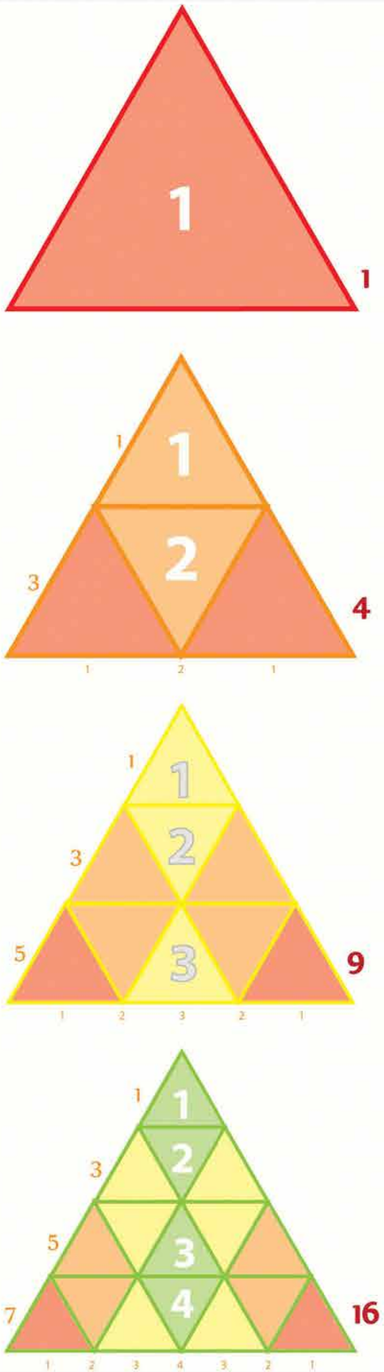


Geometry can easily map irrational numbers



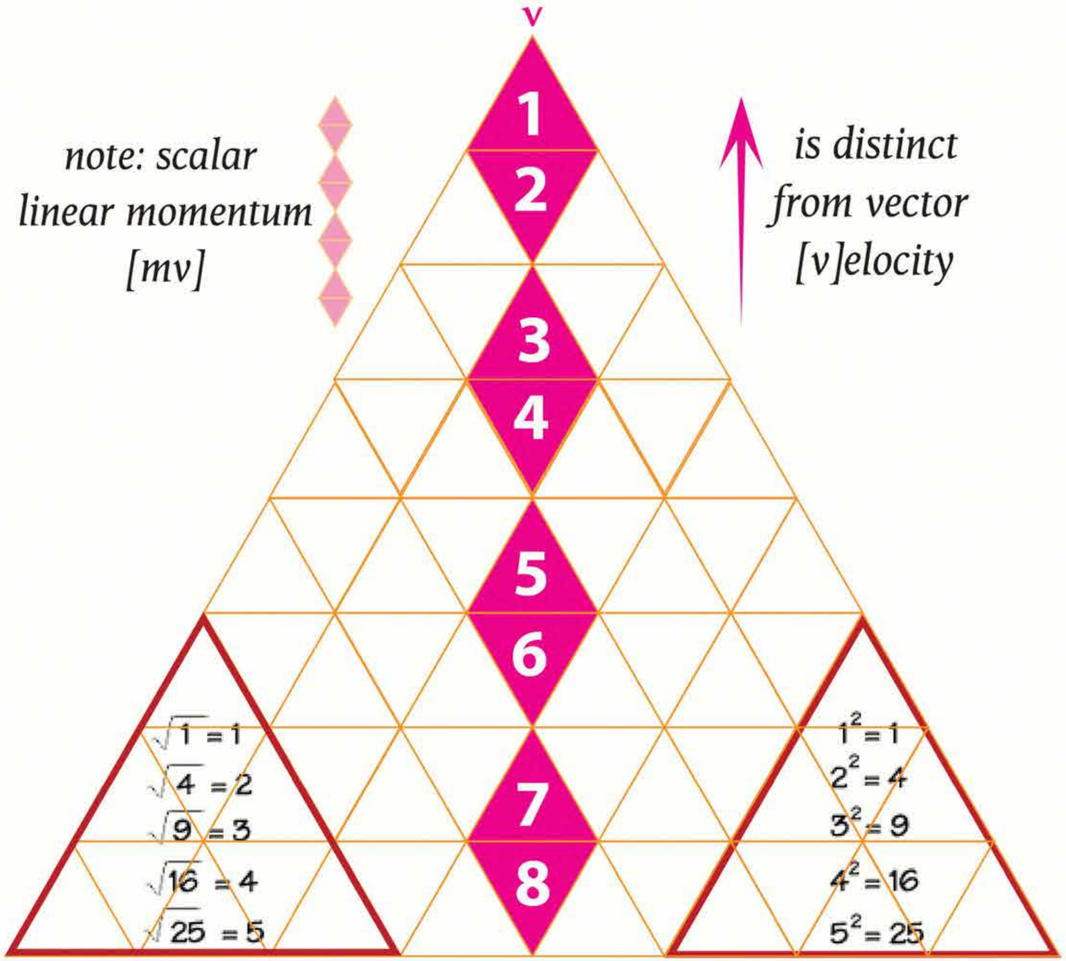
$$p^2 = E$$

In physics, the square root function maps ENERGY [E] to momentum [mv]

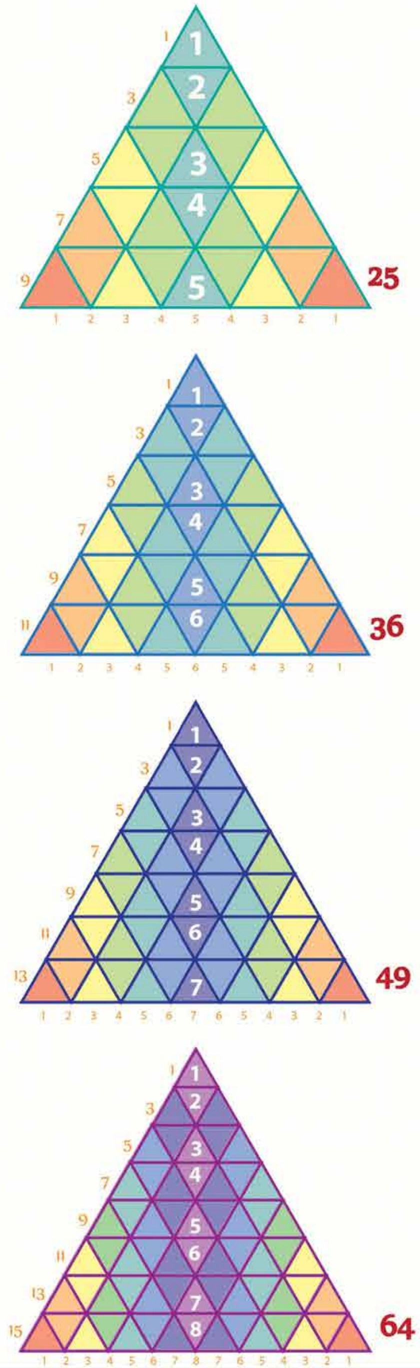


The Square roots of n

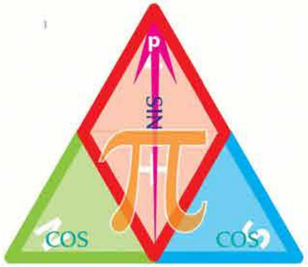
Historically, any number raised to the power of 2 has been modeled using a polygon--the square
That's why we call raising a number to the second power "squaring the number."



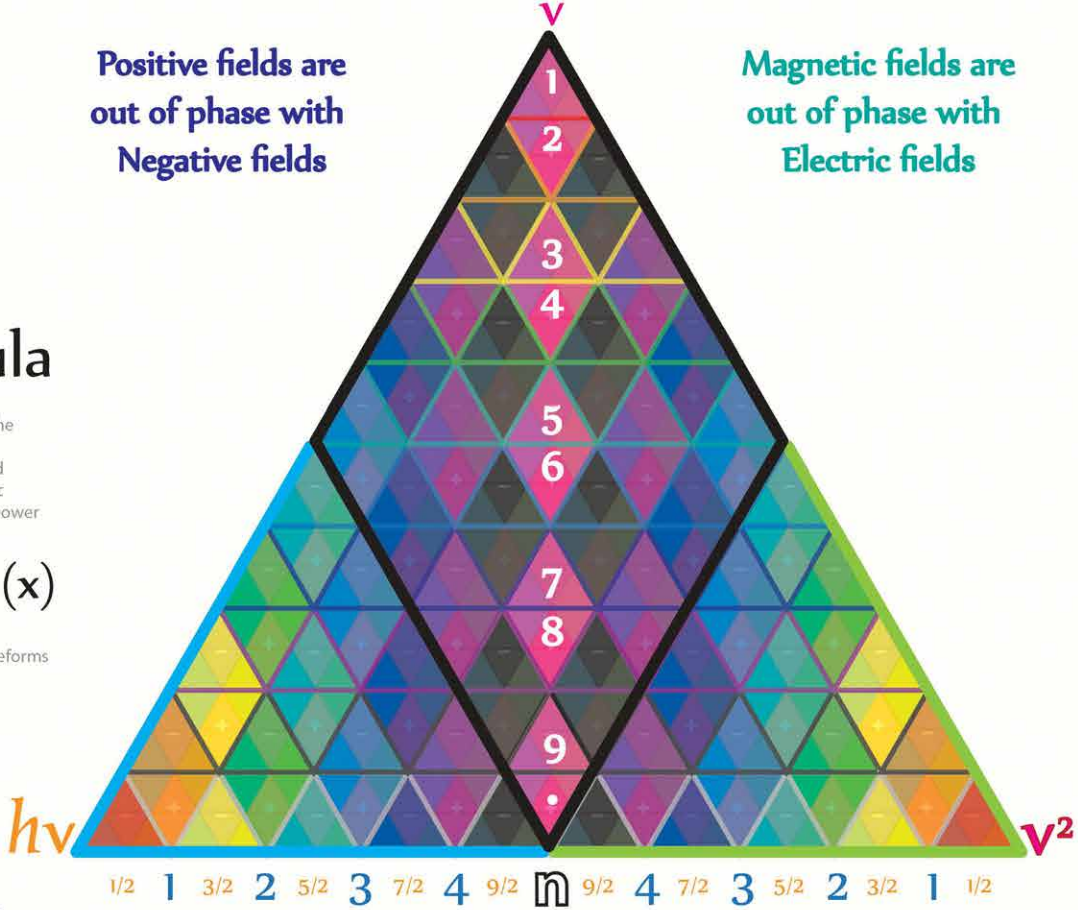
[In physics square numbers are in fact equilateral geometries]
The perfect squares are squares of whole numbers.
Here are the first eight perfect squares



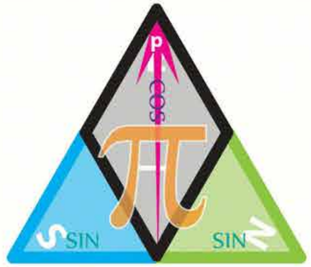
The Square root of Negative 1



Positive fields are out of phase with Negative fields



Magnetic fields are out of phase with Electric fields



Euler's Formula

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

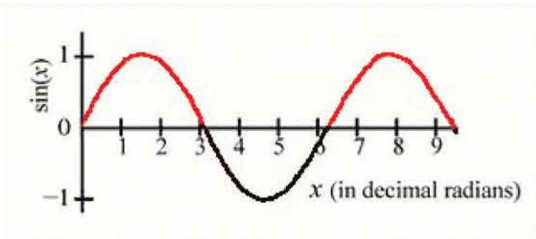
(15 April 1707 – 18 September 1783)

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

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

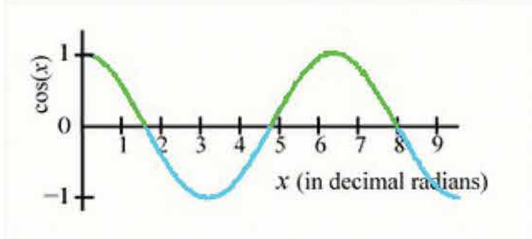
$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

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



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

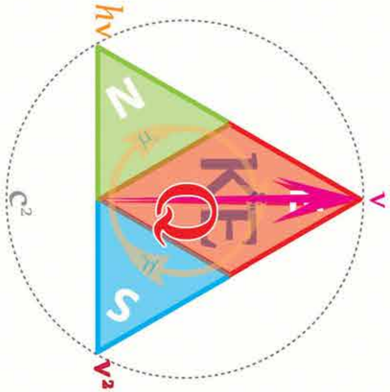
$$e^{i\pi} + 1 = 0$$



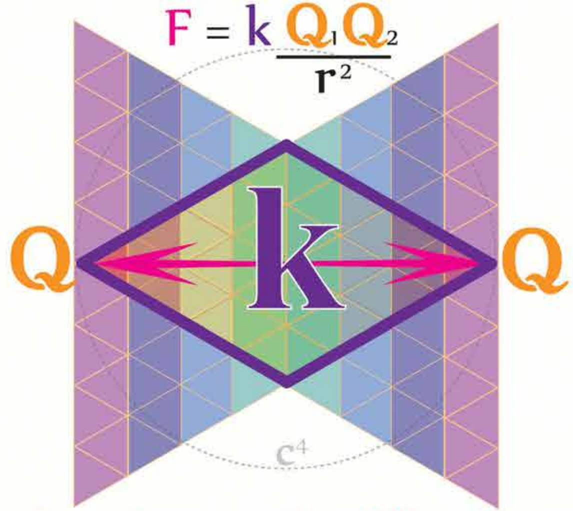
Geometric means

The geometric mean of two numbers, is the square root of their product

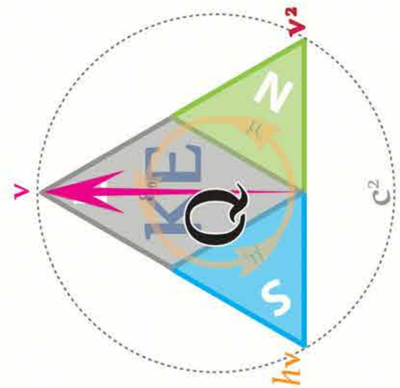
geometric square root
of positive one



$$F = k\frac{Q_1 Q_2}{r^2}$$

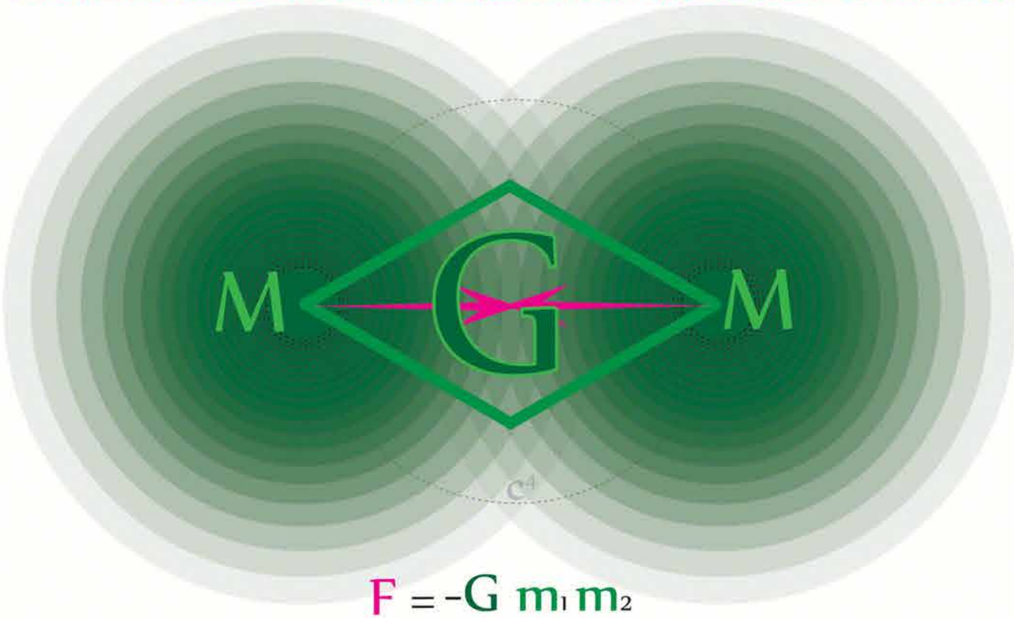


geometric square root
of negative one



In physics, the geometric mean of two superpositioned fields produces a vector square root Force

It is generally stated that
the geometric mean applies
only to positive numbers.

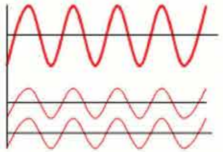


$$F = -G\frac{m_1 m_2}{r^2}$$

In Tetryonic geometry
the geometric mean applies
to positive & negative fields.

Superpositioning

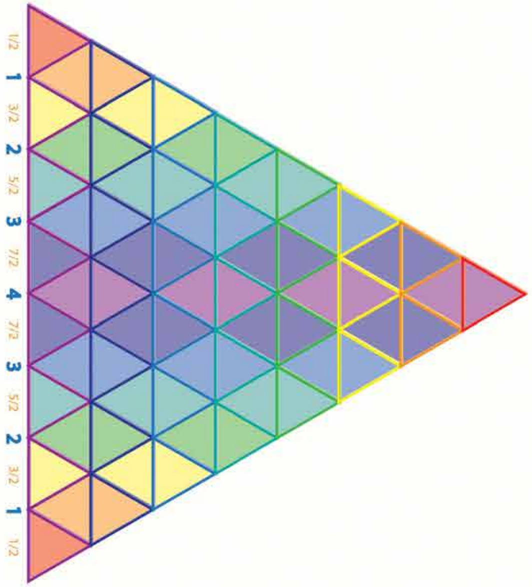
When two or more waves traverse the same space,
the net amplitude at each point is the
sum of the amplitudes of the individual waves.

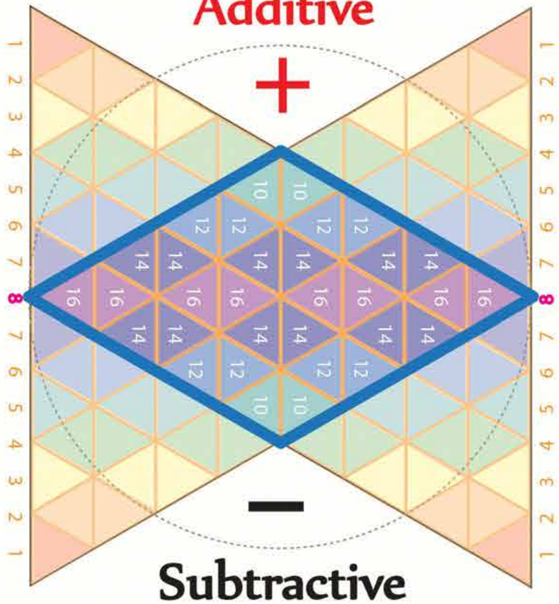


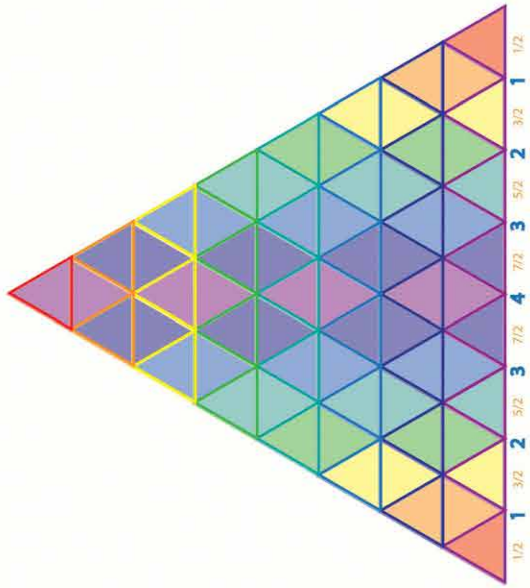
constructive interference

In phase

Additive



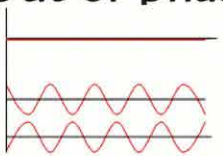




Subtractive

Out of phase

destructive interference



When two or more waves traverse the same space,
if the summed variation has a smaller amplitude
than the constiuent component variations.

The lines of Force

Tetryonic Multiplication table

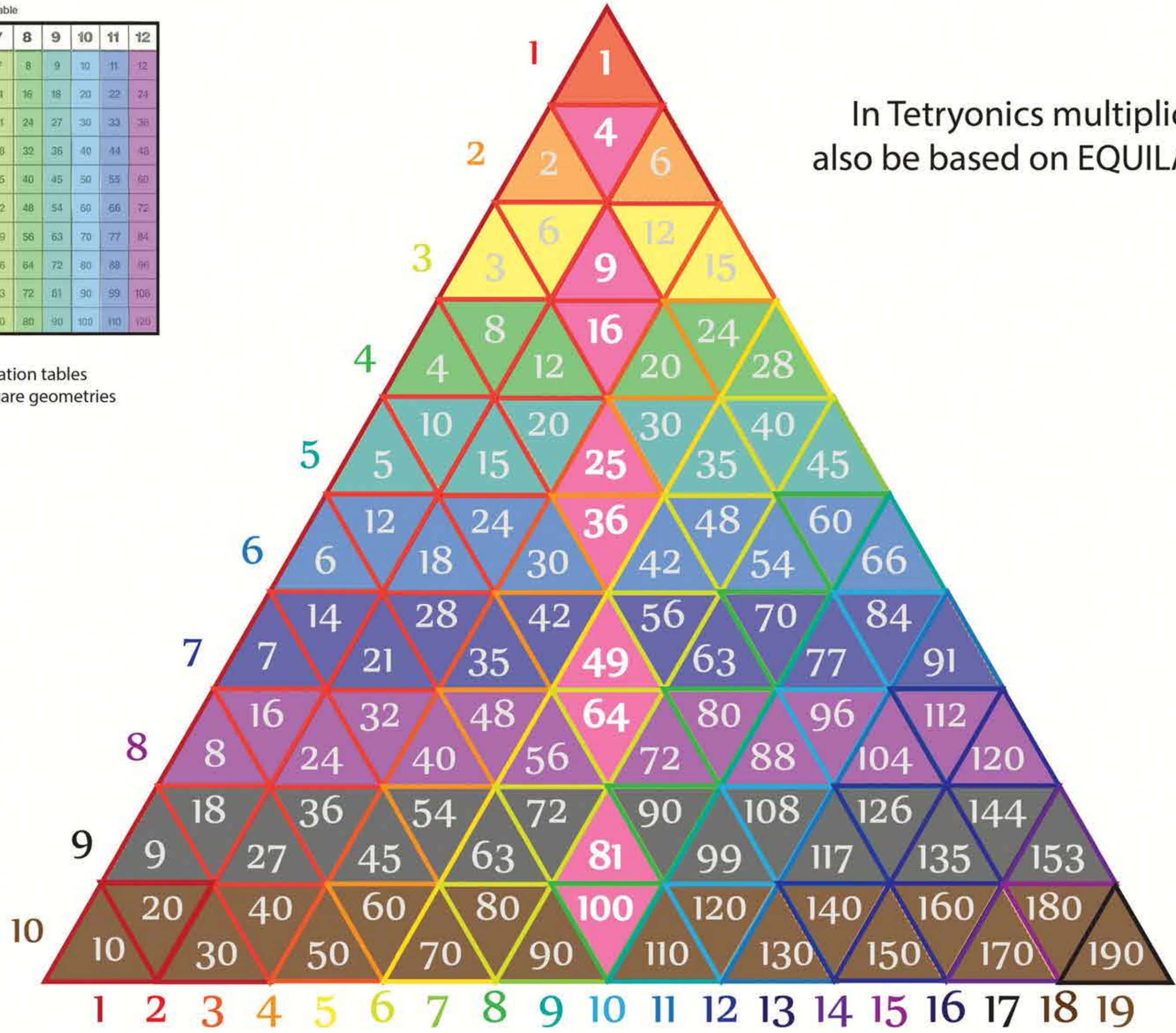
A multiplication table is a mathematical grid used to define a multiplication operation and its results

Multiplication Table

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120

Historically Multiplication tables have been based on Square geometries

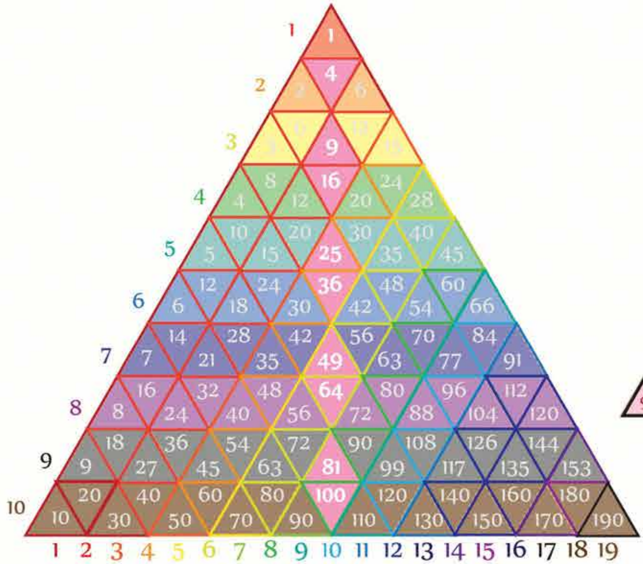
In Tetryonics multiplication tables can also be based on EQUILATERAL geometries

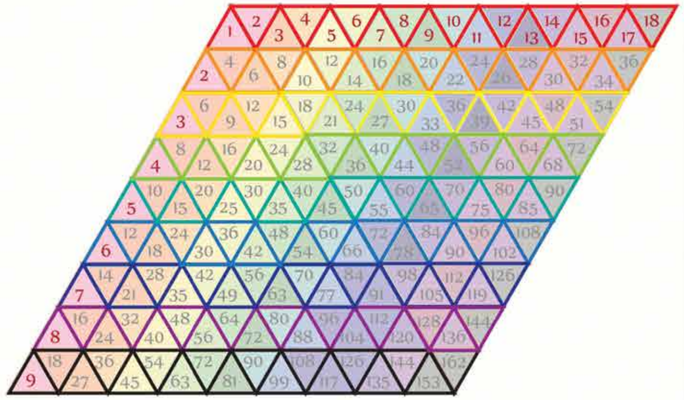


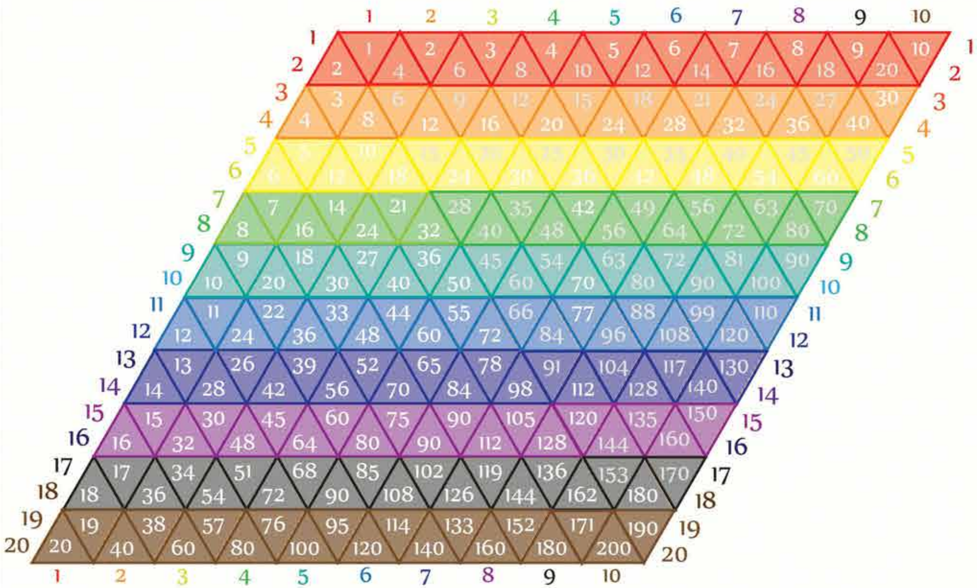
The integer multiplicitors are colour coded

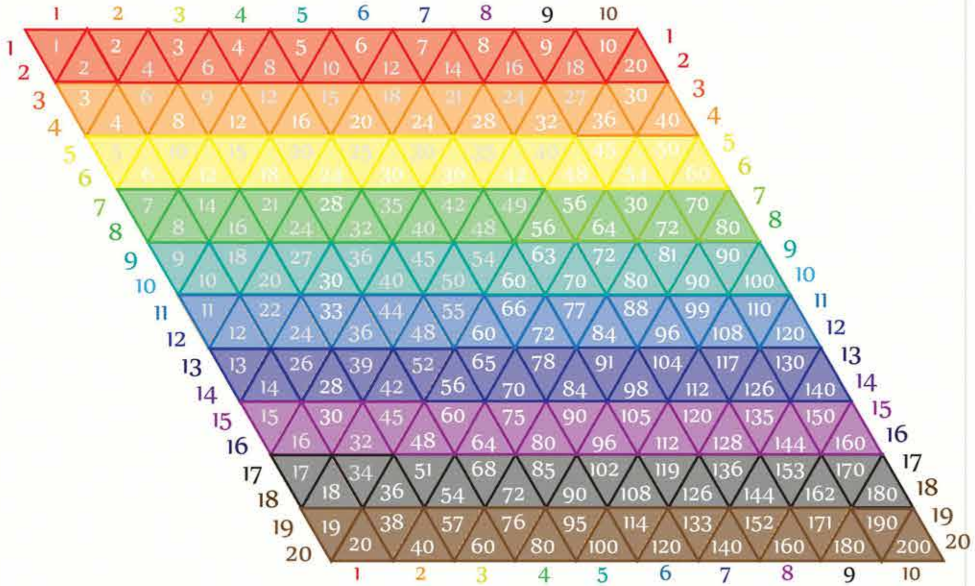
Rhombic Multiplication Tables

1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**









Photonic Root Tables

Tetryonic multiplication table can take a number of geometric forms

Square root median

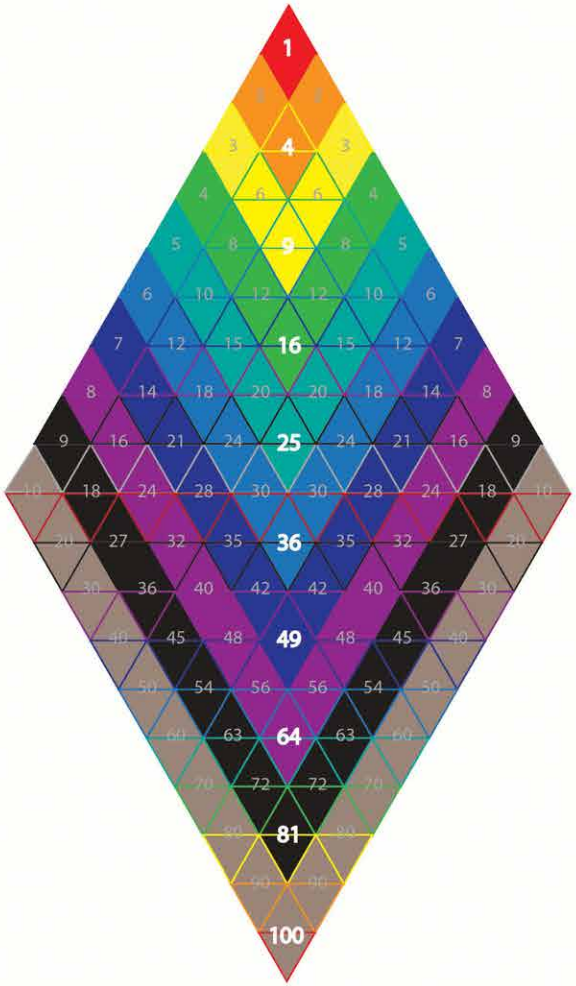
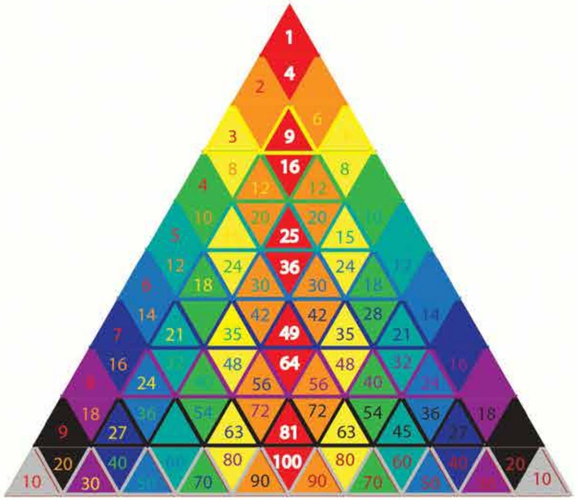


Table read diagonally



1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**

Integer median

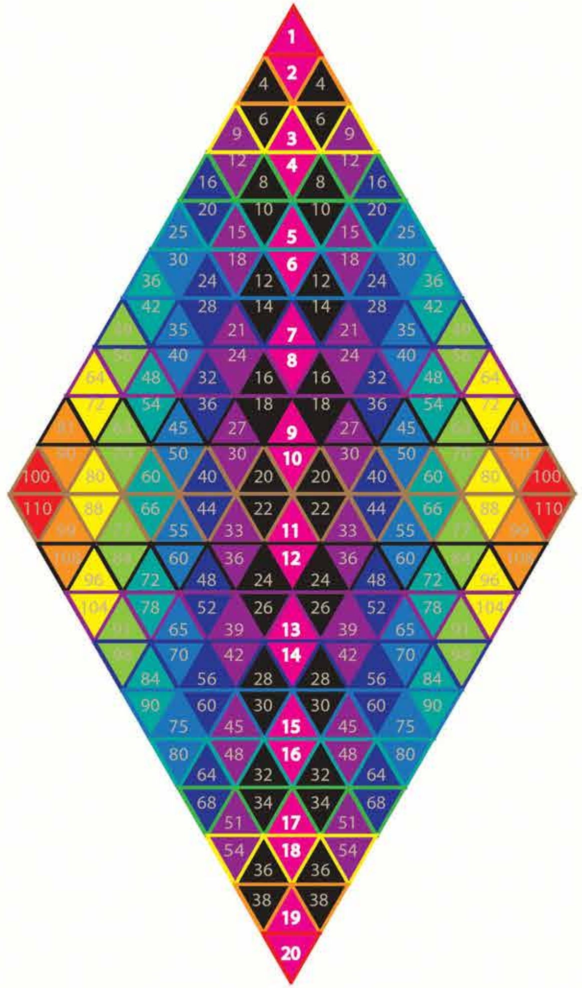
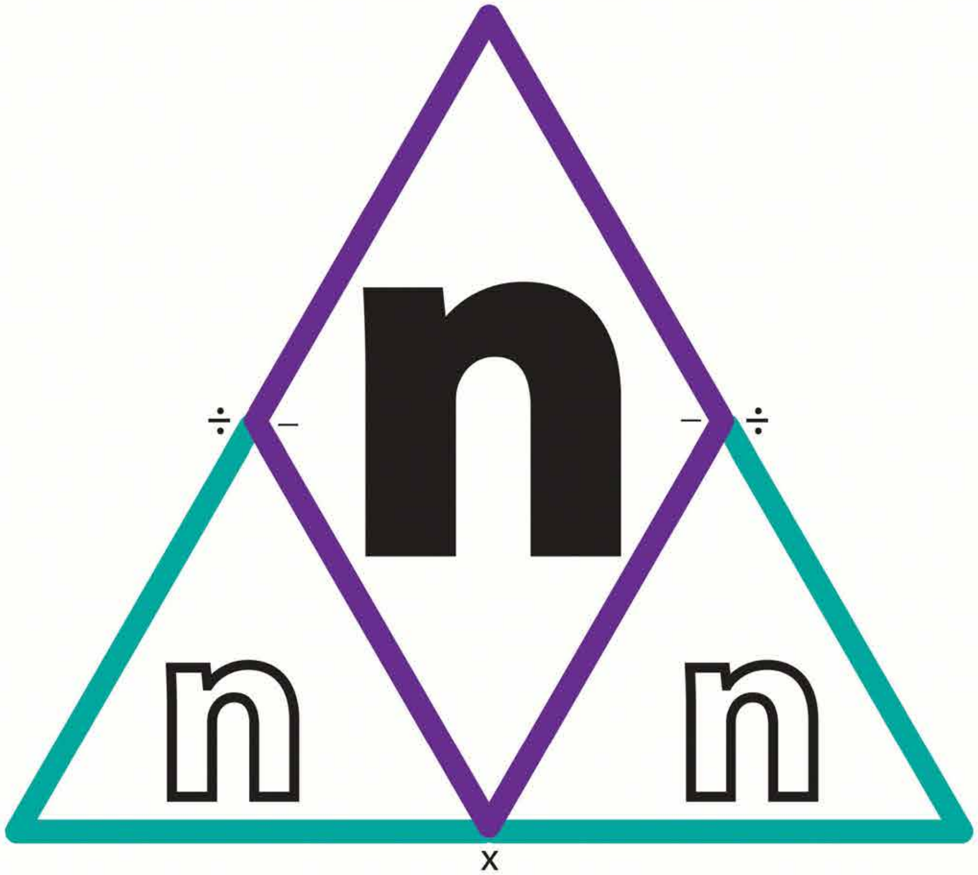


Table read from centre
to outside edge then down

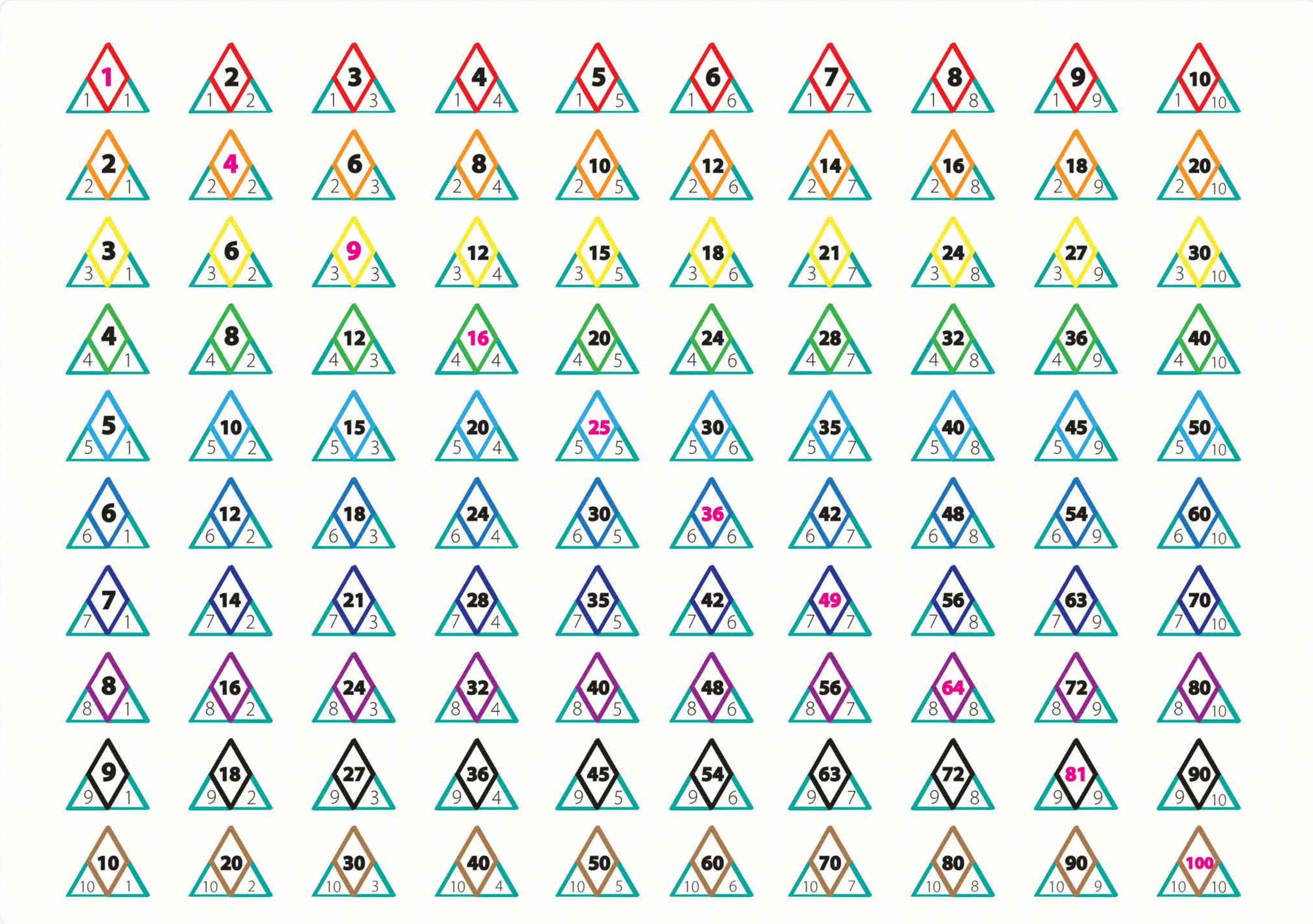
Divide [division] tables

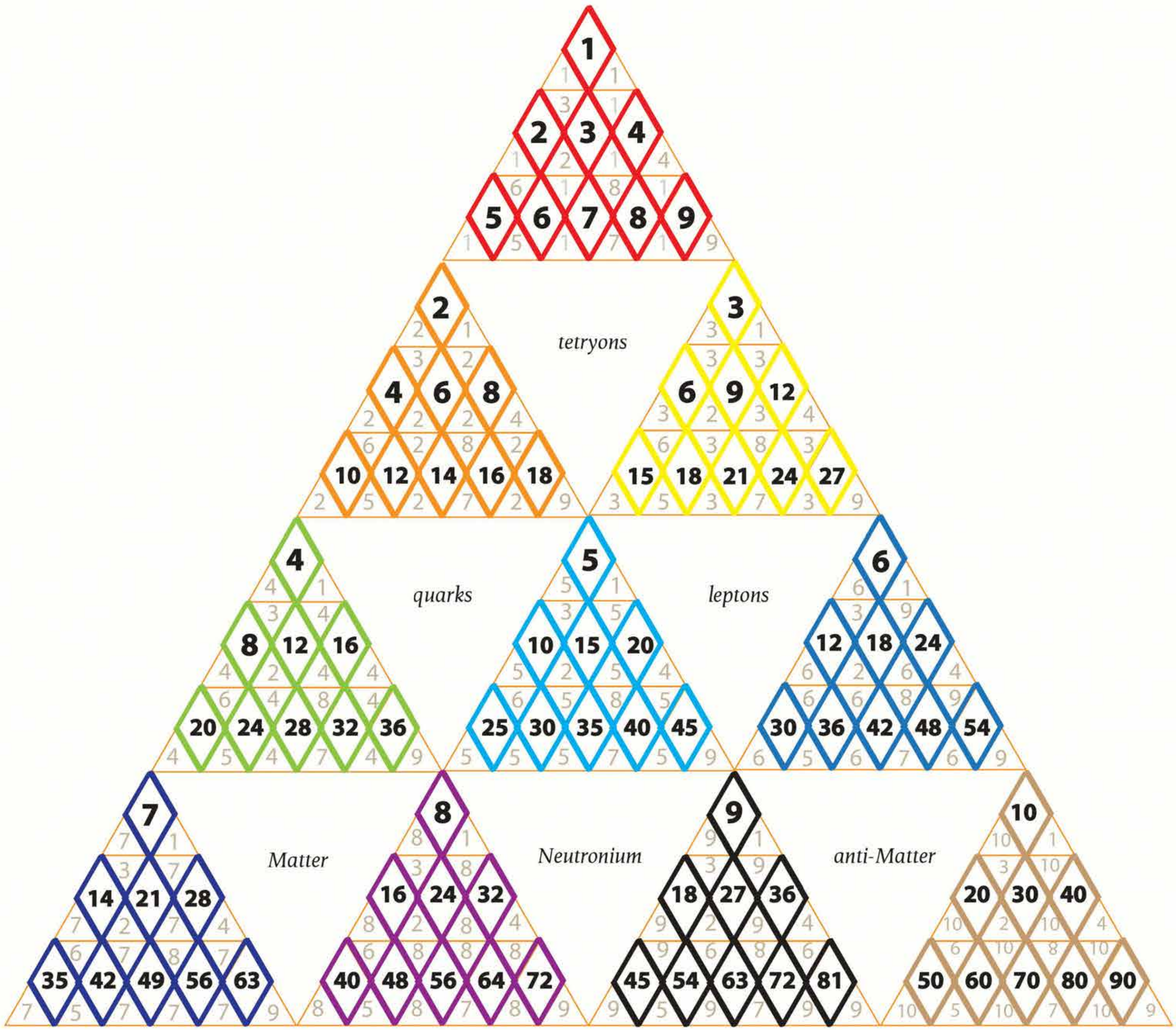
Minus [subtraction] tables



Times [multiplication] tables

Plus [addition] tables


1 1 1
2 1 2
3 1 3
4 1 4
5 1 5
6 1 6
7 1 7
8 1 8
9 1 9
10 1 10
2 2 1
4 2 2
6 2 3
8 2 4
10 2 5
12 2 6
14 2 7
16 2 8
18 2 9
20 2 10
3 3 1
6 3 2
9 3 3
12 3 4
15 3 5
18 3 6
21 3 7
24 3 8
27 3 9
30 3 10
4 4 1
8 4 2
12 4 3
16 4 4
20 4 5
24 4 6
28 4 7
32 4 8
36 4 9
40 4 10
5 5 1
10 5 2
15 5 3
20 5 4
25 5 5
30 5 6
35 5 7
40 5 8
45 5 9
50 5 10
6 6 1
12 6 2
18 6 3
24 6 4
30 6 5
36 6 6
42 6 7
48 6 8
54 6 9
60 6 10
7 7 1
14 7 2
21 7 3
28 7 4
35 7 5
42 7 6
49 7 7
56 7 8
63 7 9
70 7 10
8 8 1
16 8 2
24 8 3
32 8 4
40 8 5
48 8 6
56 8 7
64 8 8
72 8 9
80 8 10
9 9 1
18 9 2
27 9 3
36 9 4
45 9 5
54 9 6
63 9 7
72 9 8
81 9 9
90 9 10
10 10 1
20 10 2
30 10 3
40 10 4
50 10 5
60 10 6
70 10 7
80 10 8
90 10 9
100 10 10

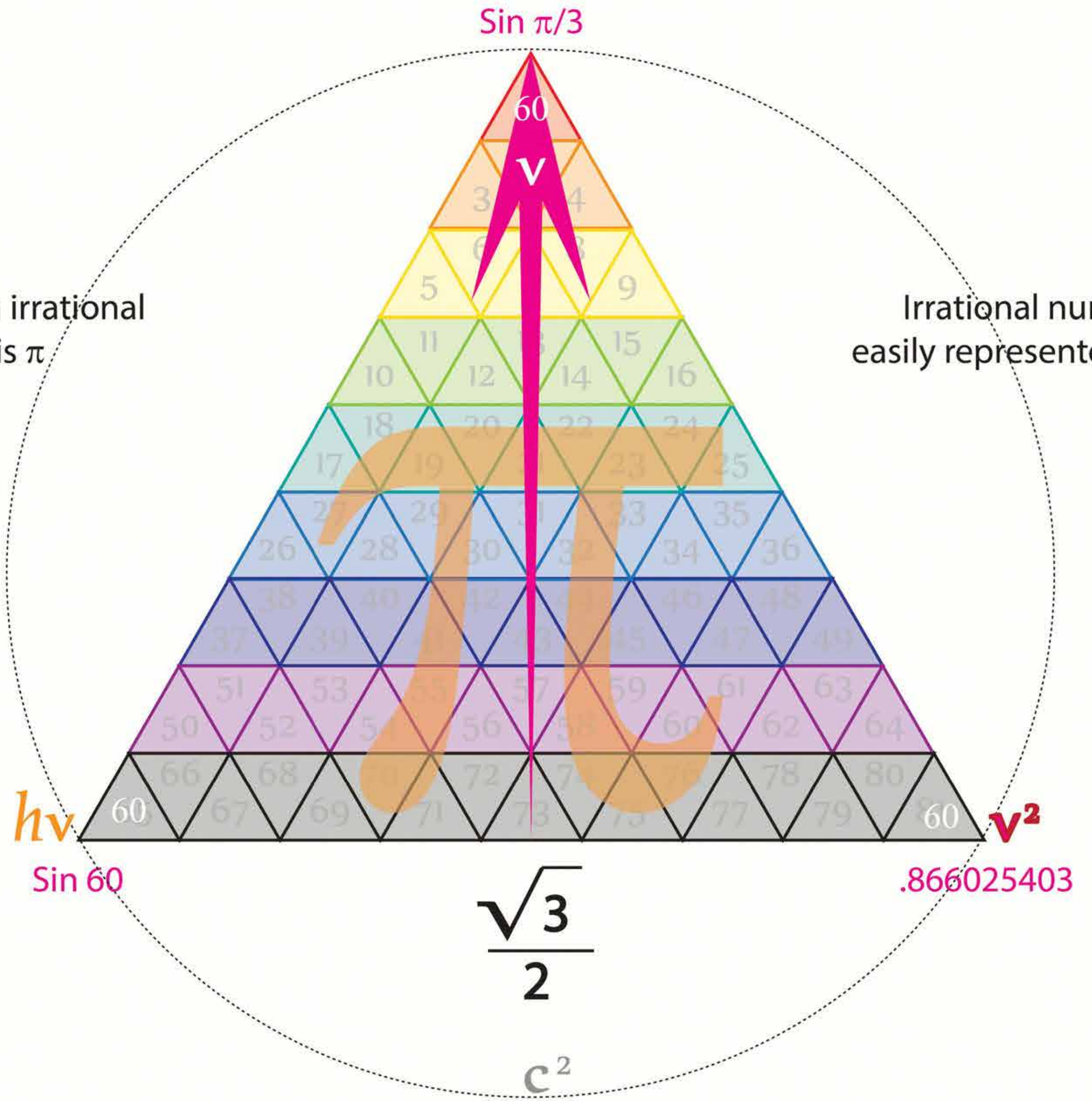

tetryons
quarks
leptons
Matter
Neutronium
anti-Matter

Irrational Numbers

An irrational number is defined to be any number that is the part of the real number system that cannot be written as a complete ratio of two integers

One well known irrational number is π

Irrational numbers can be easily represented geometrically



1	0
10	1
100	2
1,000	3

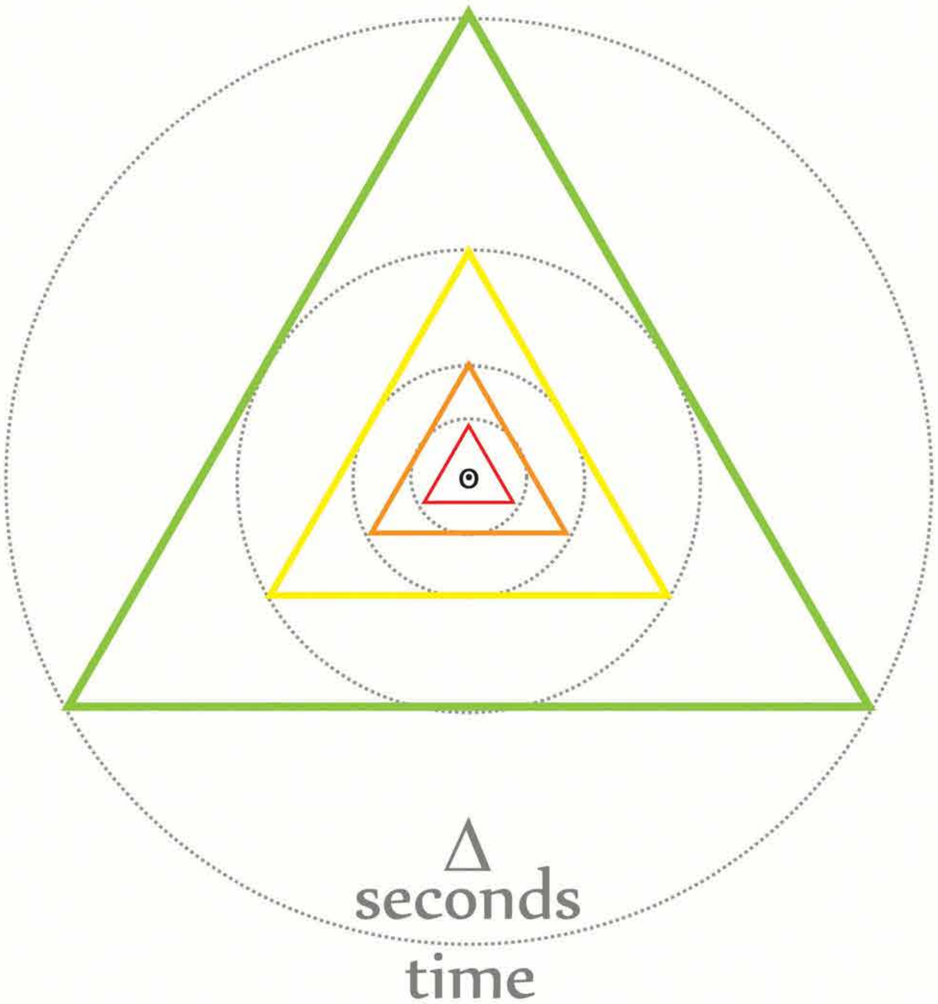
Exponentials & Logarithms

e and the Natural Log are inverse functions of each other:

e^x is the amount of continuous GROWTH after a certain amount of time.
Natural Log (ln) is the amount of TIME of continuous growth to reach a certain level

$10{,}000 = 10^4$

$\log(10{,}000) = 4$



e

How much growth after x units of time (and 100% continuous growth)

$$e^x = \lim_{n\to\infty}(1 + x/n)^n,$$

GROWTH

ln

ln(x) lets us plug in continuous growth and get the time it would take.

$$\ln(x) = \lim_{n\to\infty} n(x^{1/n} - 1).$$

PERIOD

Exponential growth

$$\text{growth} = e = \lim_{n \to \infty}\left(1 + \frac{r}{n}\right)^{t}$$

e represents the idea that all continually growing systems are scaled versions of a common rate

GEOMETRIC

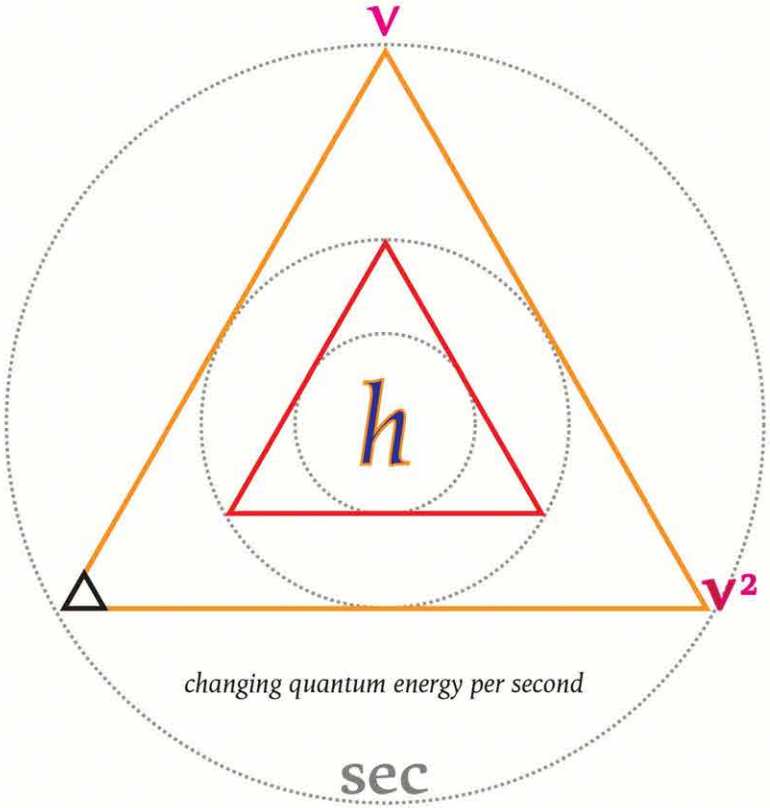
3.141592654

π

Pi is the ratio between circumference and diameter shared by all circles.

It is a fundamental ratio inherent in all circles and therefore impacts any calculation of circumference, area, volume, and surface areas

Pi radians are equally important and show all quantised equilateral energy geometries are related to their scribed circles



GROWTH

2.718281828

e

e is the base rate of growth shared by all continually growing processes.

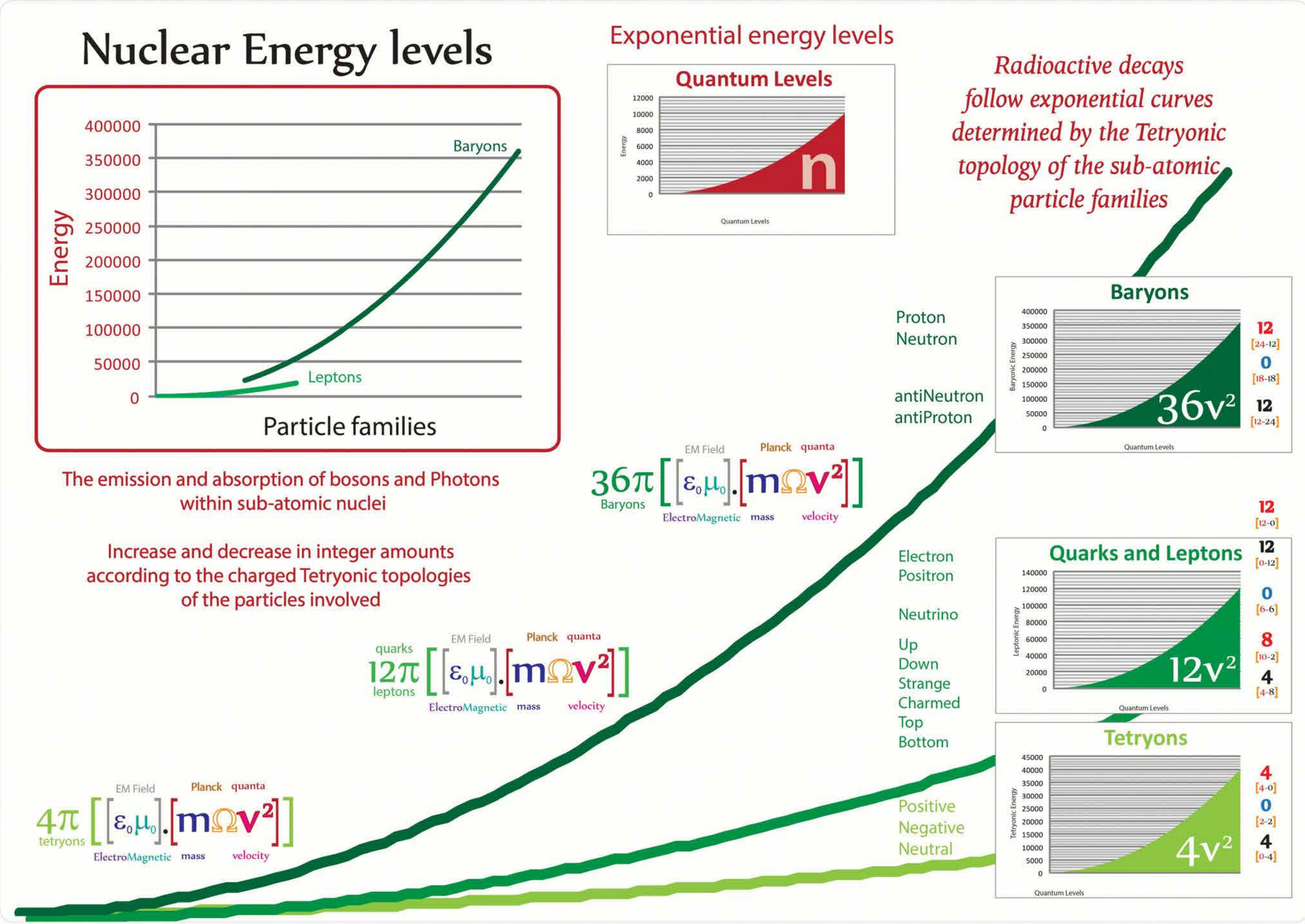
e lets you take a simple growth rate (where all the change happens all at once at the end of a period of time - ie quantised growth)

e shows up whenever systems grow exponentially and continuously..... radioactive decay, interest calculations and populations

tetryons *EM fields* *quarks*

e can be applied to the equilateral energy geometries of physical systems only where the rate of increase is a integer factor of a squared number

leptons *Baryons*



Tetryonics 86.04 - Sub-atomc exponential growth

Series addition & the Riemann Zeta Function

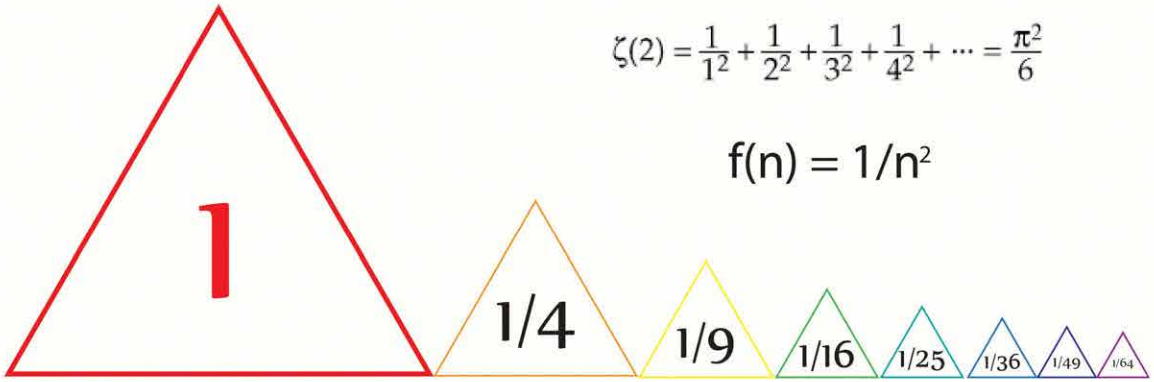
The second series addition of the Reimann Zeta function is where x=2: (pi^2)/6=1+1/2^2+1/3^2+1/4^2+...
(the sum of the reciprocals of the squares)

$$\zeta(s) = \sum_n \frac{1}{n^s}$$

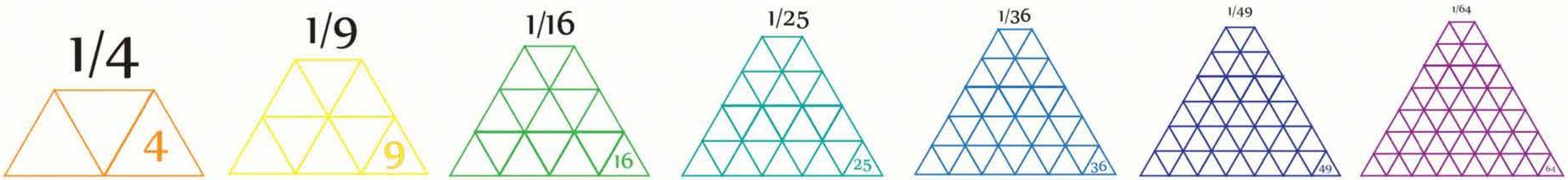
$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6}$$

$$f(n) = 1/n^2$$

$$\sum_{n=1}^{\infty} \frac{1}{n^x}$$



In mathematics, the Riemann zeta function, is a prominent function of great significance in number theory. It is a named after German mathematician Bernhard Riemann. It is so important because of its relation to the distribution of prime numbers. It also has applications in other areas such as physics, probability theory, and applied statistics



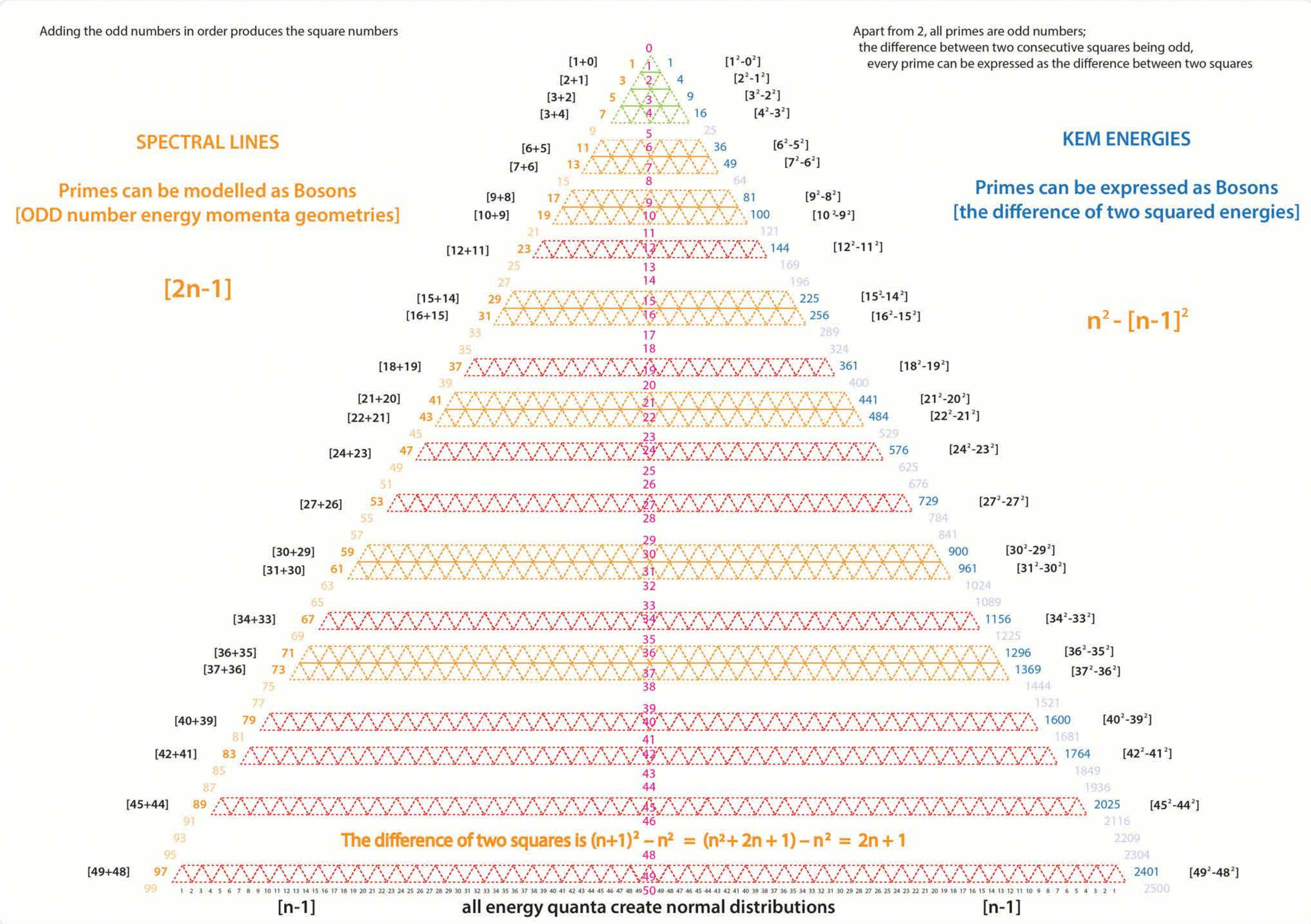
The mystery of prime numbers
Question: which natural numbers are prime? how are they distributed among natural numbers?

Primes are basic building blocks for natural numbers:

- any natural number is a product of prime numbers
- a prime number is only divisible by itself and by 1:
  (it cannot be further simplified)

We don't know how to predict where the prime numbers are:

“Prime numbers grow like weeds among the natural numbers, seeming to obey no other law than that of chance but also exhibit stunning regularity" (Don Zagier, number theorist)


Adding the odd numbers in order produces the square numbers
Apart from 2, all primes are odd numbers;
the difference between two consecutive squares being odd,
every prime can be expressed as the difference between two squares
SPECTRAL LINES
Primes can be modelled as Bosons
[ODD number energy momenta geometries]
[2n-1]
KEM ENERGIES
Primes can be expressed as Bosons
[the difference of two squared energies]
n² - [n-1]²
The difference of two squares is (n+1)² – n² = (n² + 2n + 1) – n² = 2n + 1
[n-1]
all energy quanta create normal distributions
[n-1]

Prime number Distributions

A twin prime is a prime number that differs from another prime number by two, for example the twin prime pair (41, 43). Sometimes the term twin prime is used for a pair of twin primes; an alternative name for this is prime twin or prime pair.

Twin primes appear despite the general tendency of gaps between adjacent primes to become larger as the numbers themselves get larger due to the prime number theorem (the "average gap" between primes less than n is log(n)).

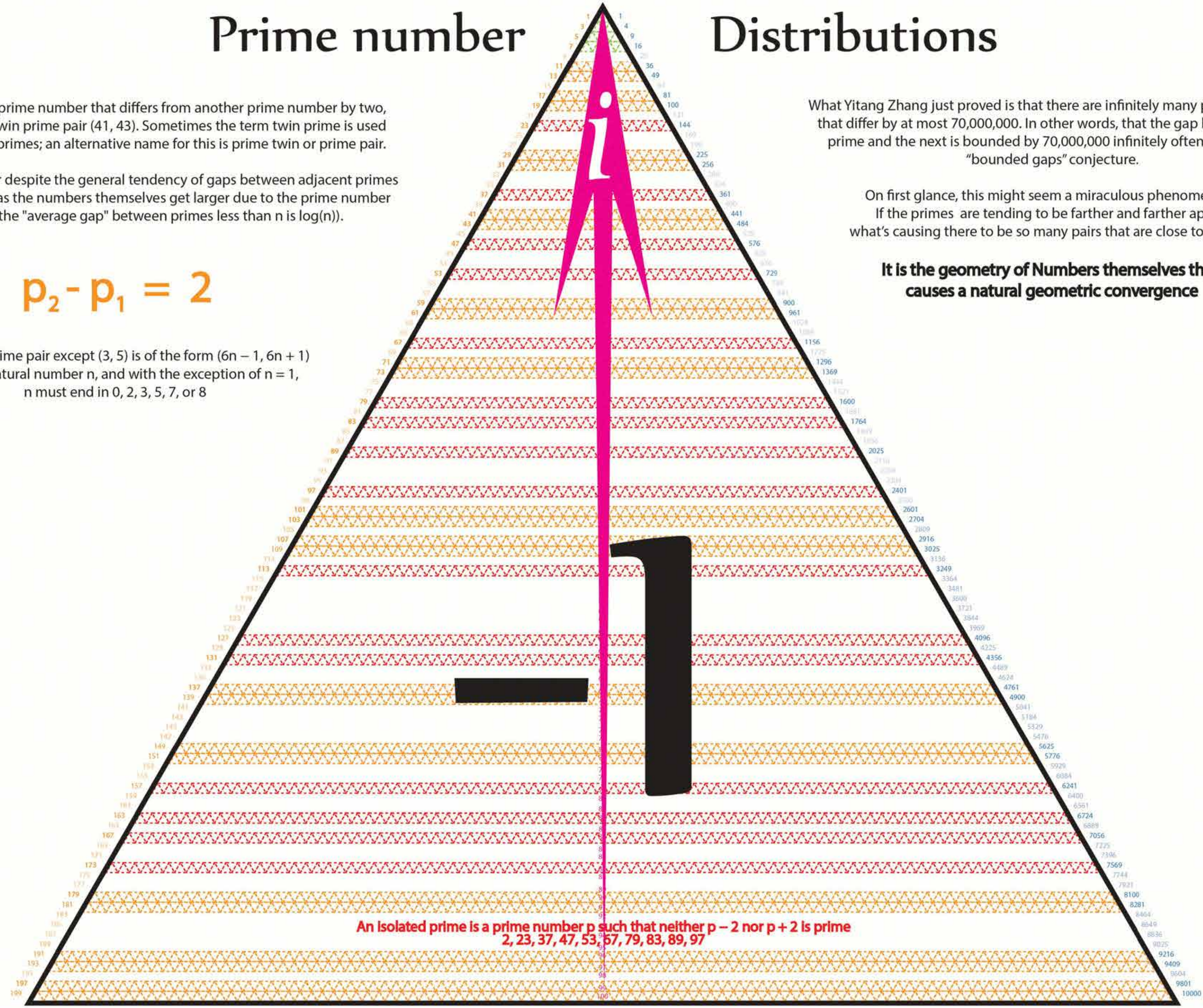
$$p_2 - p_1 = 2$$

Every twin prime pair except (3, 5) is of the form (6n – 1, 6n + 1) for some natural number n, and with the exception of n = 1, n must end in 0, 2, 3, 5, 7, or 8

What Yitang Zhang just proved is that there are infinitely many pairs of primes that differ by at most 70,000,000. In other words, that the gap between one prime and the next is bounded by 70,000,000 infinitely often—thus, the "bounded gaps" conjecture.

On first glance, this might seem a miraculous phenomenon. If the primes are tending to be farther and farther apart, what's causing there to be so many pairs that are close together?

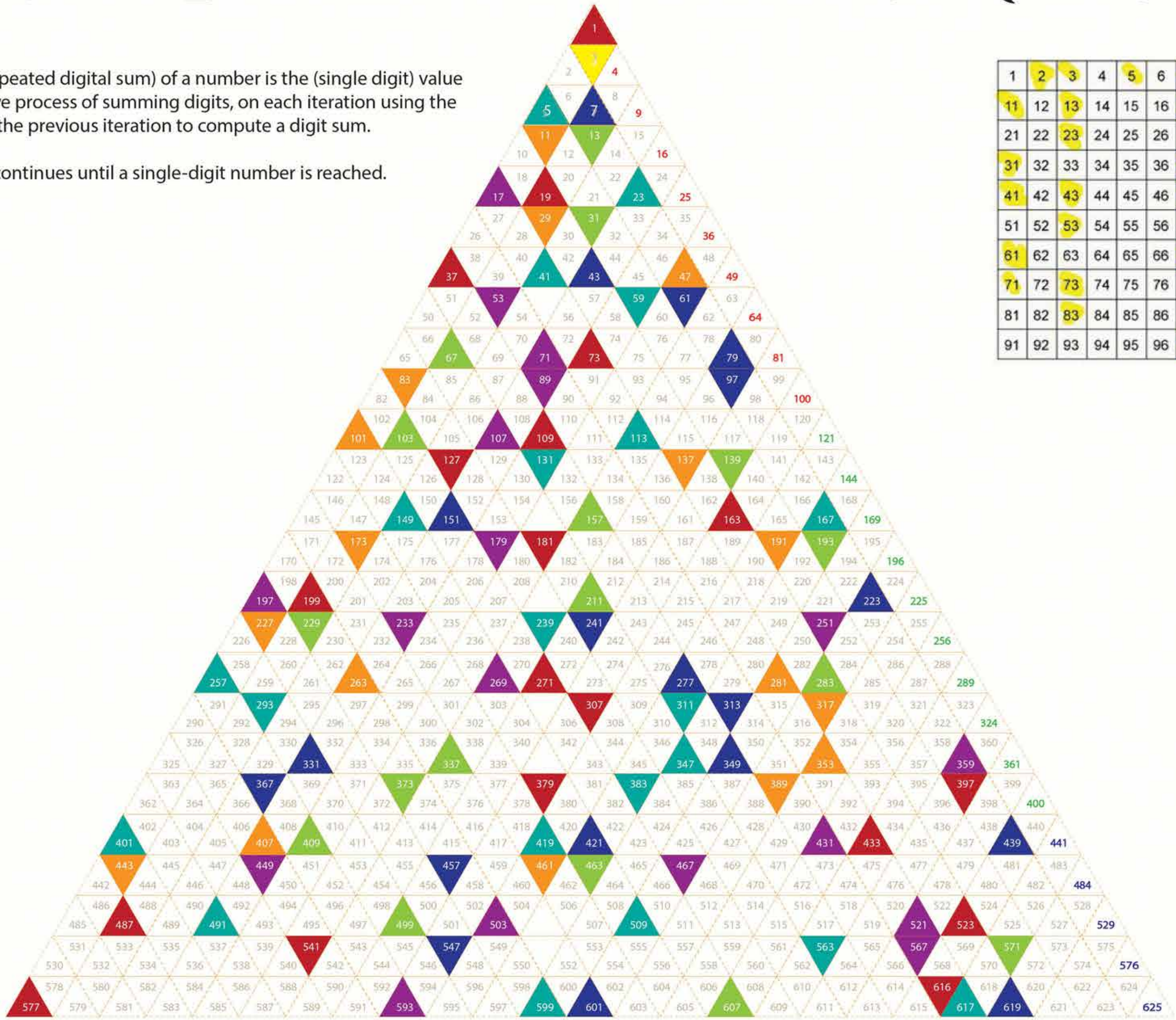
It is the geometry of Numbers themselves that causes a natural geometric convergence



The Digital roots of Prime numbers

The digital root (also repeated digital sum) of a number is the (single digit) value obtained by an iterative process of summing digits, on each iteration using the result from the previous iteration to compute a digit sum.

The process continues until a single-digit number is reached.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Archimedes is given credit for the first calculus.

Archimedes infinite series

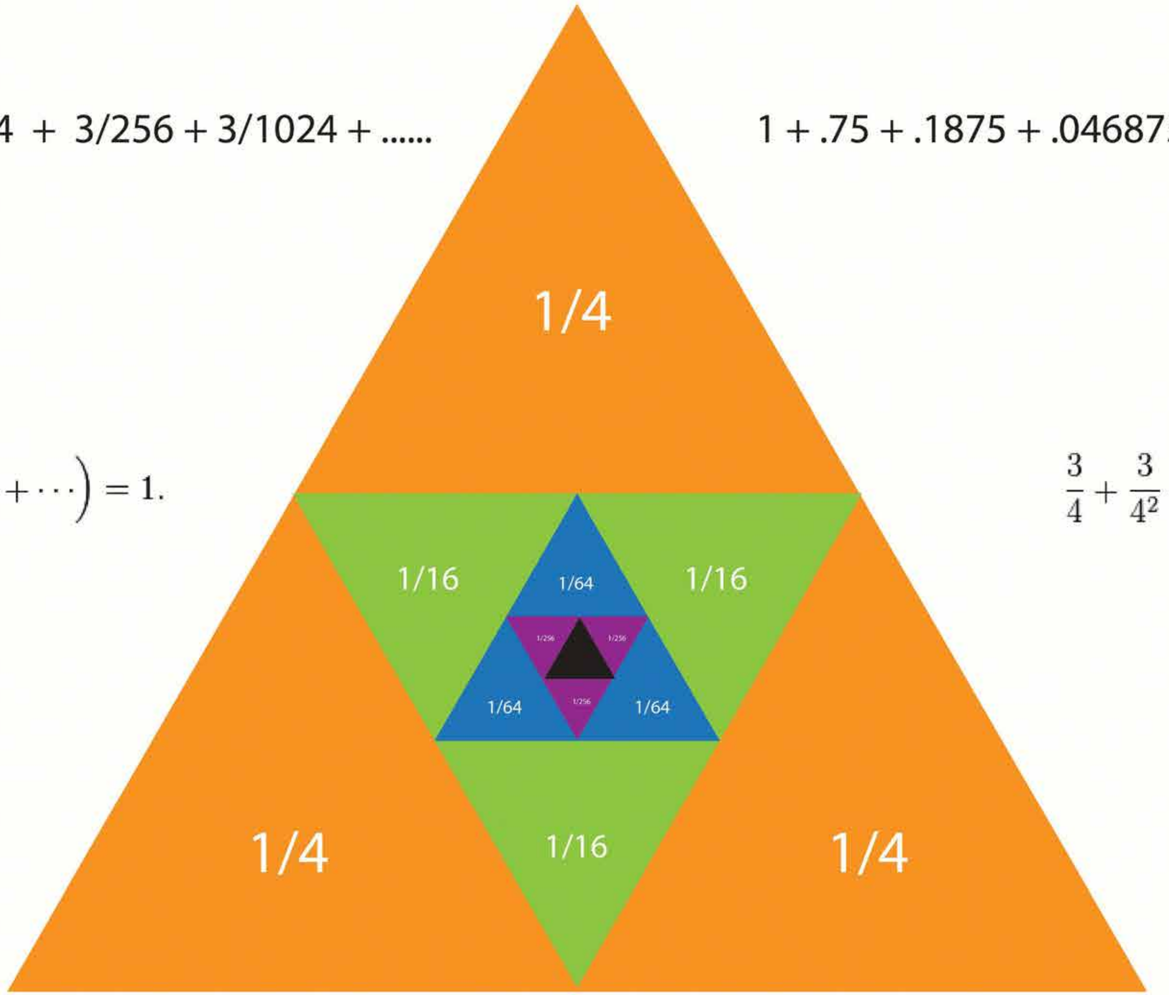
Today's calculus was published by Newton.

1 + 3/4 + 3/16 + 3/64 + 3/256 + 3/1024 + ...

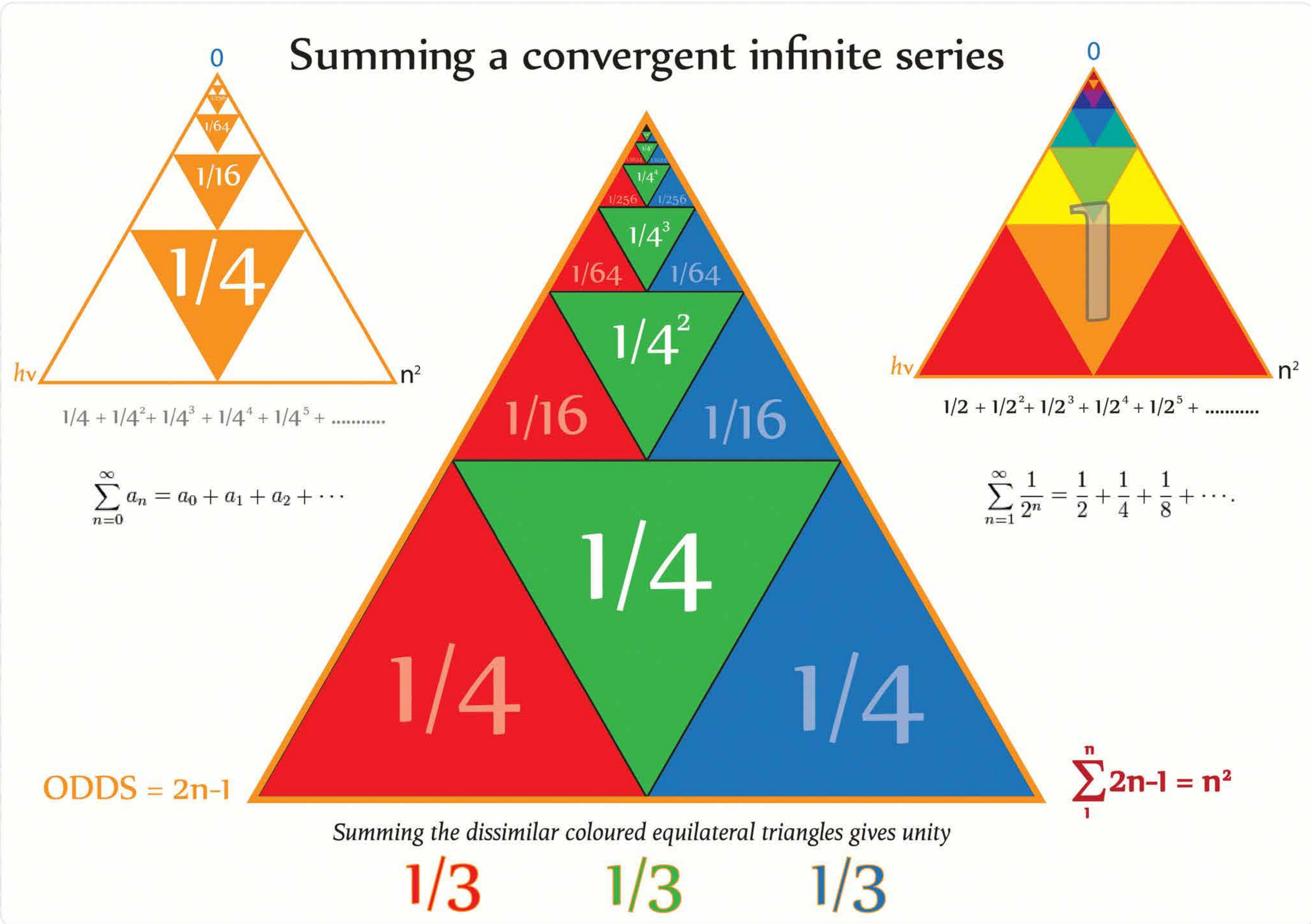
1 + .75 + .1875 + .046875 + .01171875 + ...

$$3\left(\frac{1}{4}+\frac{1}{4^2}+\frac{1}{4^3}+\frac{1}{4^4}+\cdots\right)=1.$$

$$\frac{3}{4}+\frac{3}{4^2}+\frac{3}{4^3}+\frac{3}{4^4}+\cdots=1.$$

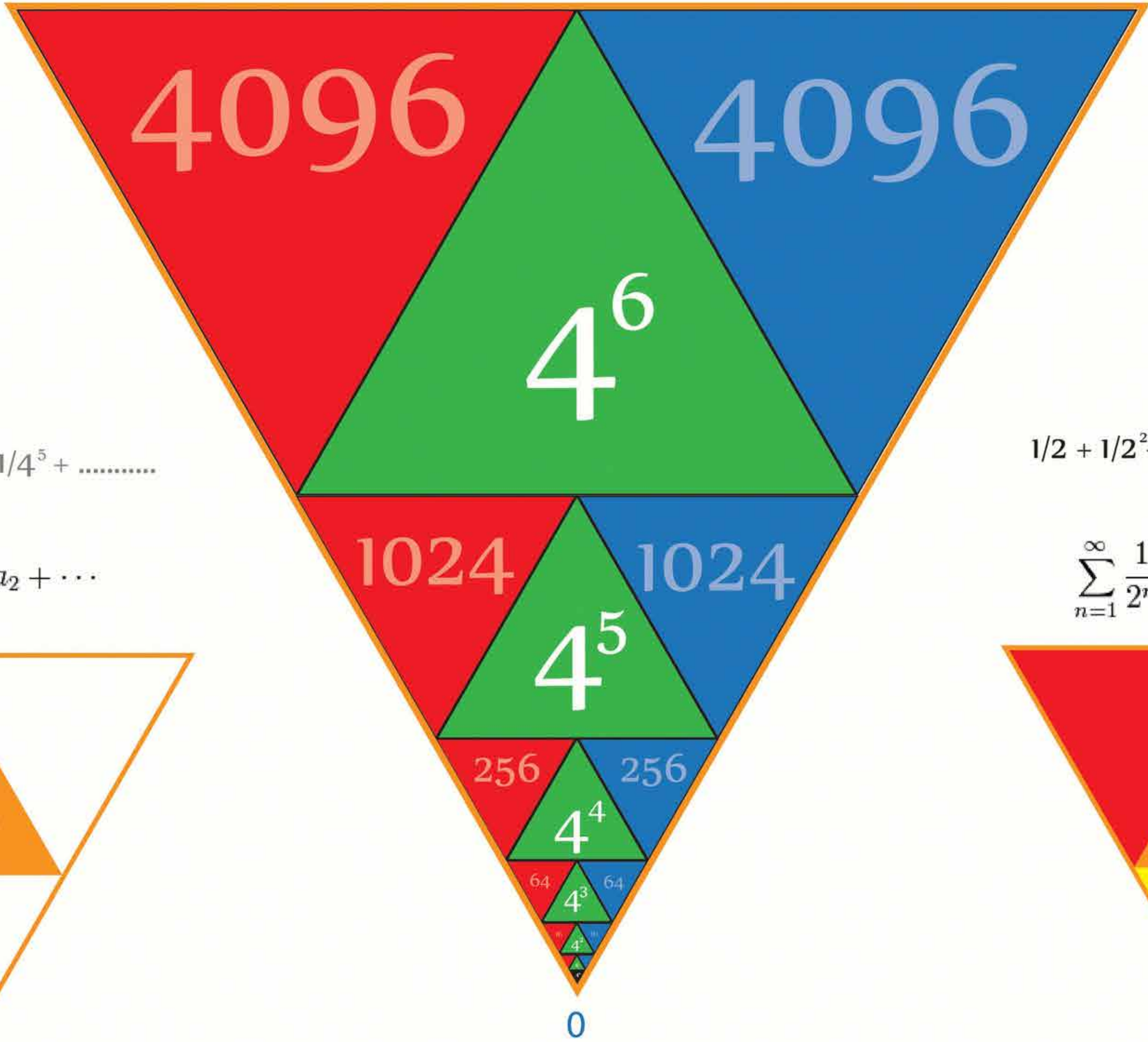


Nested convergent infinite series


Summing a convergent infinite series
0
1/64
1/16
1/4
hv
n²
1/4 + 1/4² + 1/4³ + 1/4⁴ + 1/4⁵ + ...
$\sum_{n=0}^{\infty} a_n = a_0 + a_1 + a_2 + \cdots$
ODDS = 2n-1
1/4²
1/4³
1/64
1/64
1/256
1/256
1/16
1/16
1/4
1/4
1/4
0
1
hv
n²
1/2 + 1/2² + 1/2³ + 1/2⁴ + 1/2⁵ + ...
$\sum_{n=1}^{\infty} \frac{1}{2^n} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots.$
$\sum_{1}^{n} 2n-1 = n^2$
Summing the dissimilar coloured equilateral triangles gives unity
1/3 1/3 1/3

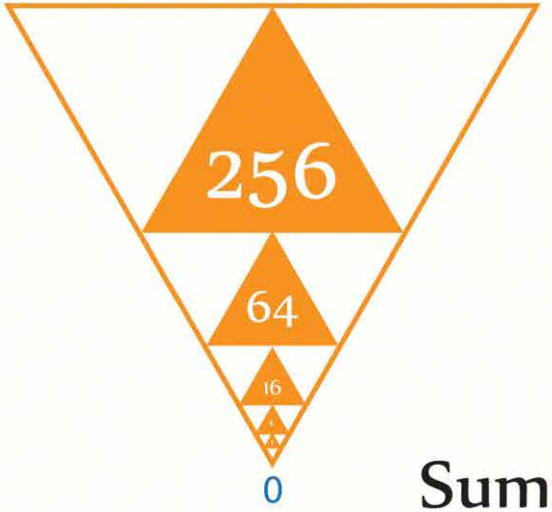
1/3 1/3 1/3

Summing the dissimilar coloured equilateral triangles gives unity



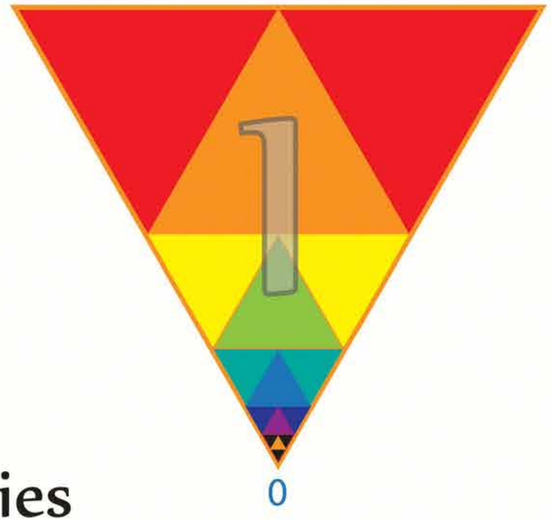
$1/4 + 1/4^2 + 1/4^3 + 1/4^4 + 1/4^5 + \ldots\ldots\ldots\ldots$

$$\sum_{n=0}^{\infty} a_n = a_0 + a_1 + a_2 + \cdots$$



$1/2 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + \ldots\ldots\ldots\ldots$

$$\sum_{n=1}^{\infty} \frac{1}{2^n} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots.$$



Summing a divergent infinite series

Pietro Mengoli

(1626 – June 7, 1686)

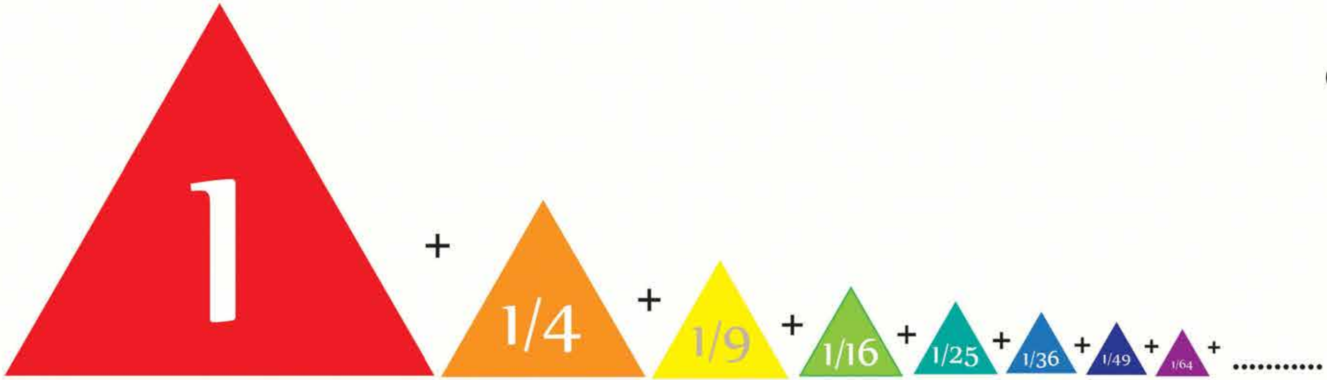
The Basel Problem

The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6} \approx 1.644934$$

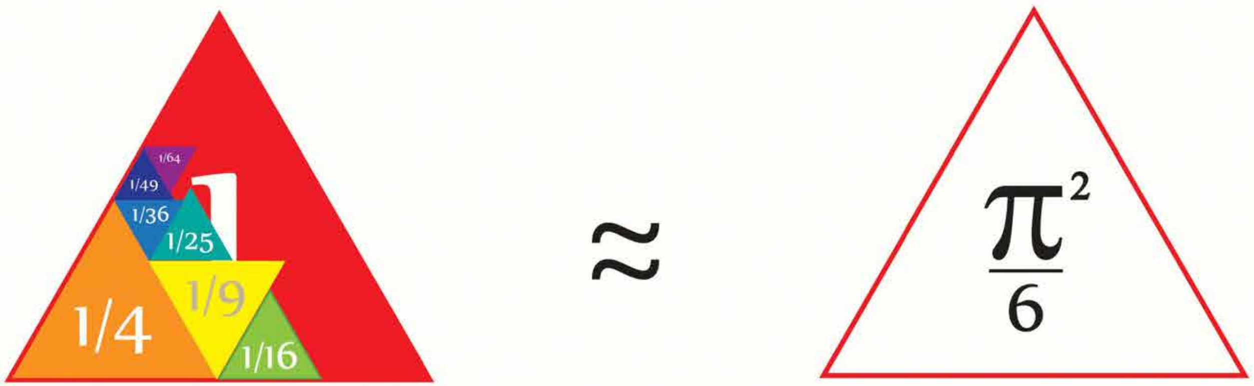
Leonhard Euler

(15 April 1707 – 18 Sept 1783)



The Basel problem asks for the precise summation of the reciprocals of the squares of the natural numbers, i.e. the precise sum of the infinite series

$$f(n) = 1/n^2$$



Integrals of mass-energy

is a means of finding scalar areas using summation and limits.

Integration is a micro adding of ***CONTINUOUS*** quantities.

$$\int_{n}^{\infty} f(x)$$

Integration is a special case of summation.

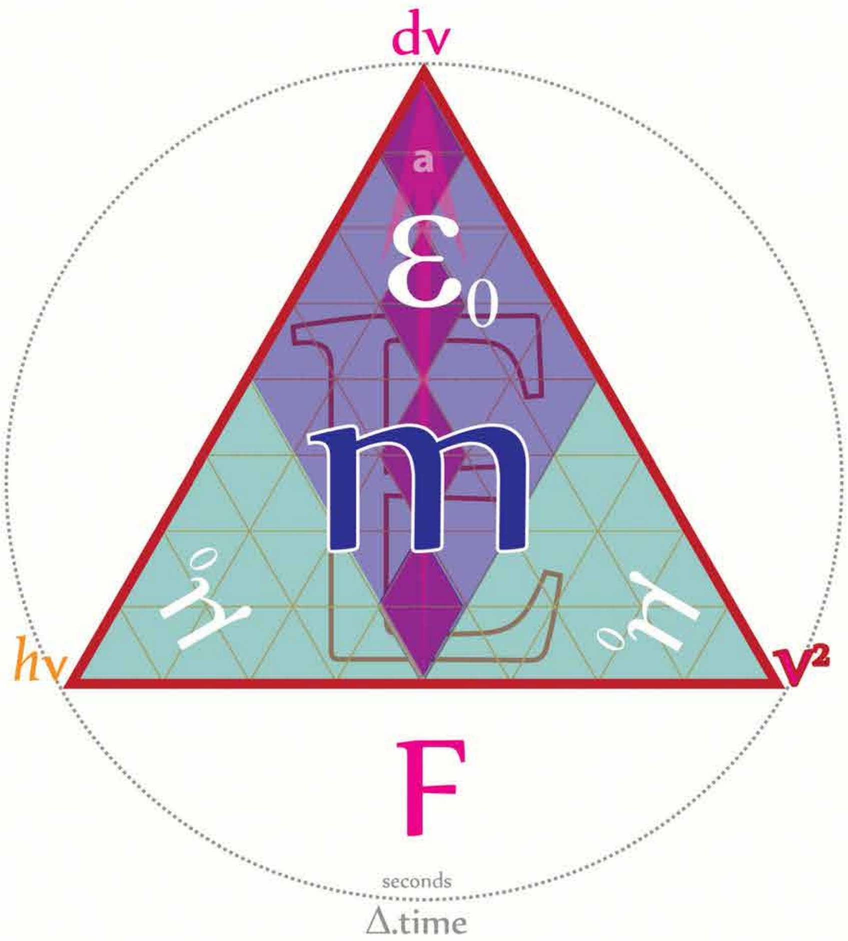
Integration is defined as the limit of a summation as the number of elements approches infinity while a part of their respective value approaches zero.

Summation is the finite sum of multiple, fixed values.

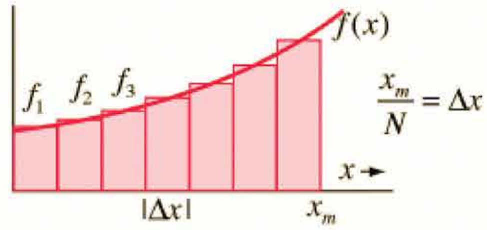
$$\sum_{n}^{\infty} x$$

Summation is a macro adding of ***DISCRETE*** quantities.

The summation of equilateral energy momenta quanta with respect to their linear vector components



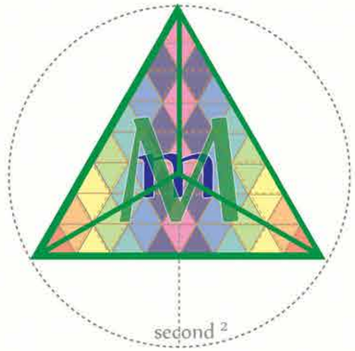
Integrating the energy quanta contained within equilateral charge geometry gives the variable Force required to acheive changes in motion [Energy, work, acceleration]



The Integral of the continuous area under the curve is the summation of an infinte number of disctrete rectangular measurements made to a specified limit

An integration isn't a simple summation, but the limit of a sequence of summations

All Planck energies are discrete equilateral geometries



mass is the surface integral of EM energy geometries per unit of time

"The calculus of infinitesimals"

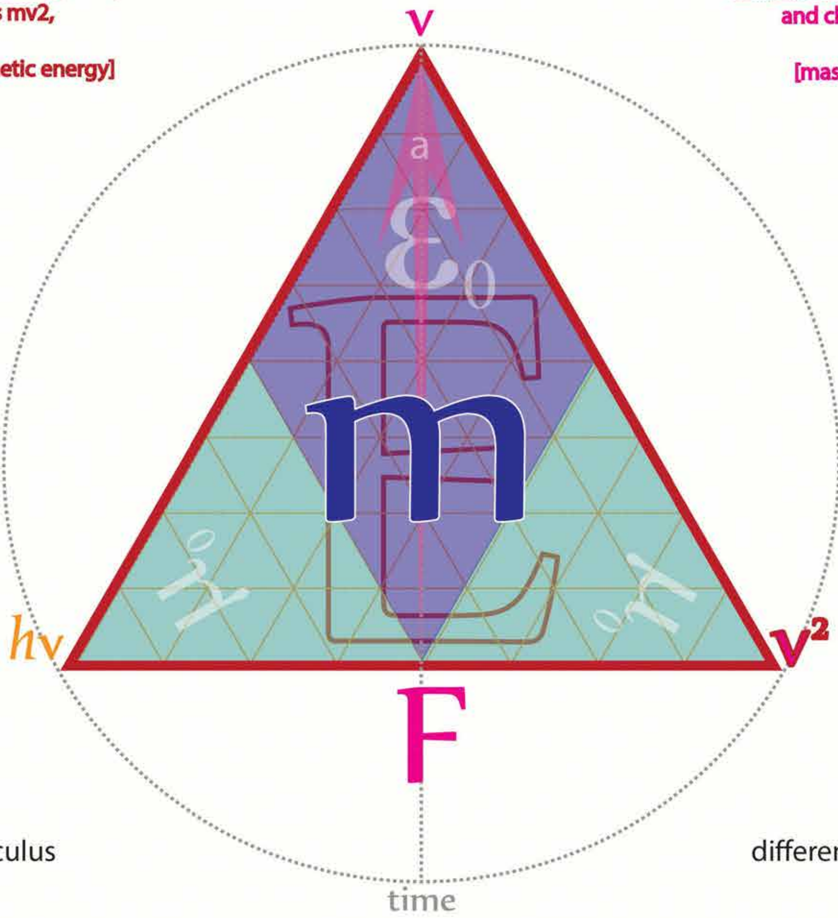
The fundamental theorem of calculus
simply states that the sum of infinitesimal changes in a quantity over time
adds up to the net change in the quantity.

Scalar Energy

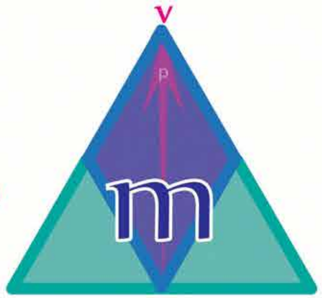
$E = mv^2$

Leibniz's vis viva (Latin for living force) is mv2,

[2 x kinetic energy]



vector Force



Much of Newton's work centred around momentum and changes to it

[mass.velocity]

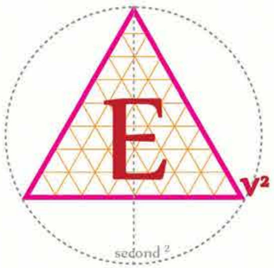
$F = m[dv/dt]$

Gottfried Wilhelm von Leibniz

(July 1, 1646 – November 14, 1716)

Sir Isaac Newton

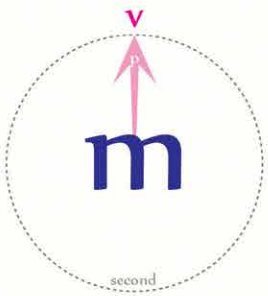
(1643-1727)



integral calculus

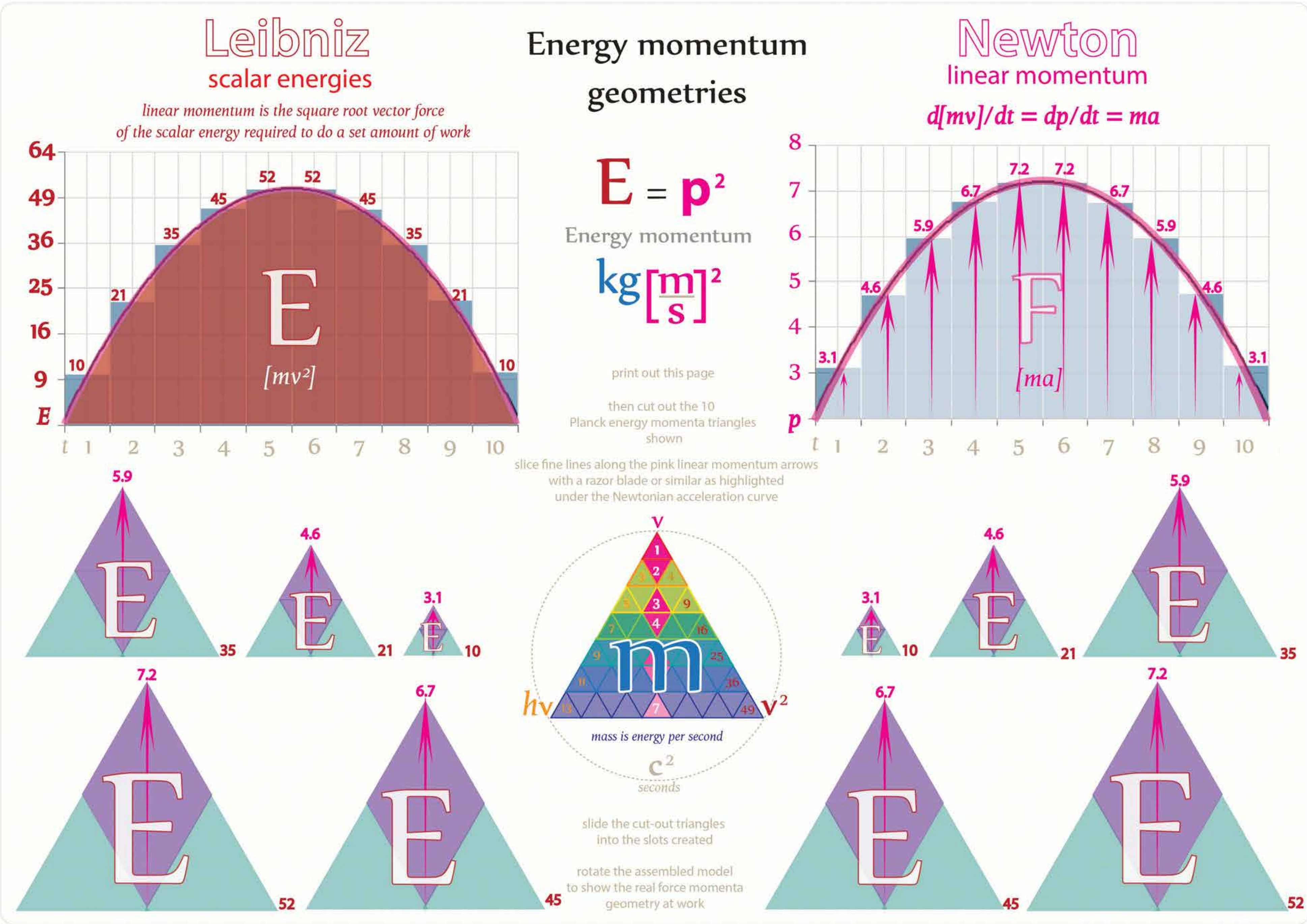
The founders of calculus thought of the integral as an infinite sum of rectangles of infinitesimal width

differential calculus

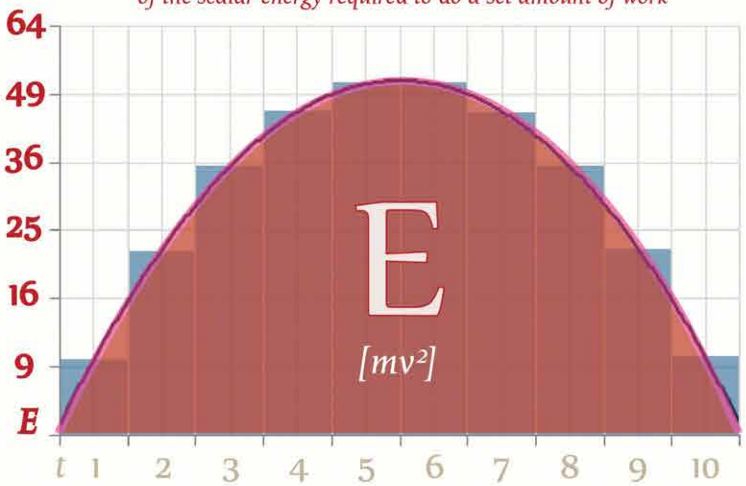


In calculus, a branch of mathematics, the derivative is a measure of how a function changes as its input changes

The fundamental theorem of calculus is a theorem that links the concept of the integral with the derivative of a function.


Leibniz
scalar energies
linear momentum is the square root vector force
of the scalar energy required to do a set amount of work
64
49
36
25
16
9
E
10 21 35 45 52 52 45 35 21 10
E
[mv²]
t 1 2 3 4 5 6 7 8 9 10
Energy momentum
geometries
E = p²
Energy momentum
kg [m/s]²
print out this page
then cut out the 10
Planck energy momenta triangles
shown
slice fine lines along the pink linear momentum arrows
with a razor blade or similar as highlighted
under the Newtonian acceleration curve
Newton
linear momentum
d[mv]/dt = dp/dt = ma
8 7 6 5 4 3 p
3.1 4.6 5.9 6.7 7.2 7.2 6.7 5.9 4.6 3.1
F
[ma]
t 1 2 3 4 5 6 7 8 9 10
5.9 35
4.6 21
3.1 10
7.2 52
6.7 45
v
hv
v²
m
mass is energy per second
c²
seconds
slide the cut-out triangles
into the slots created
rotate the assembled model
to show the real force momenta
geometry at work

linear momentum is the square root vector force
of the scalar energy required to do a set amount of work



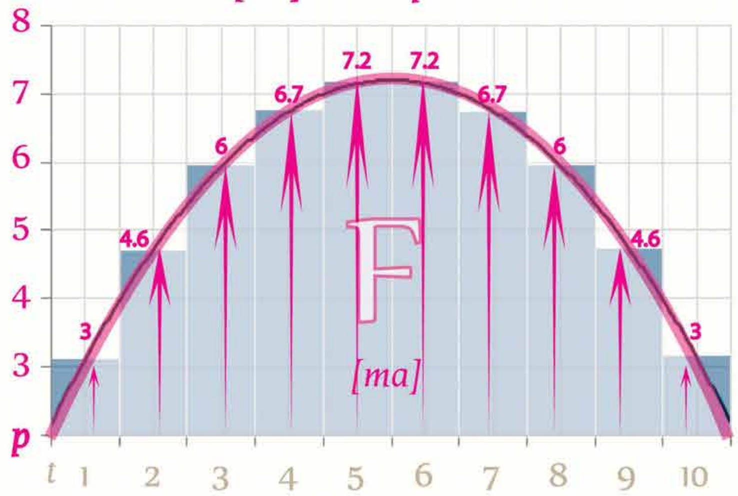
p

linear momentum

$kg \frac{m}{s}$

print out this page

$d[mv]/dt = dp/dt = ma$



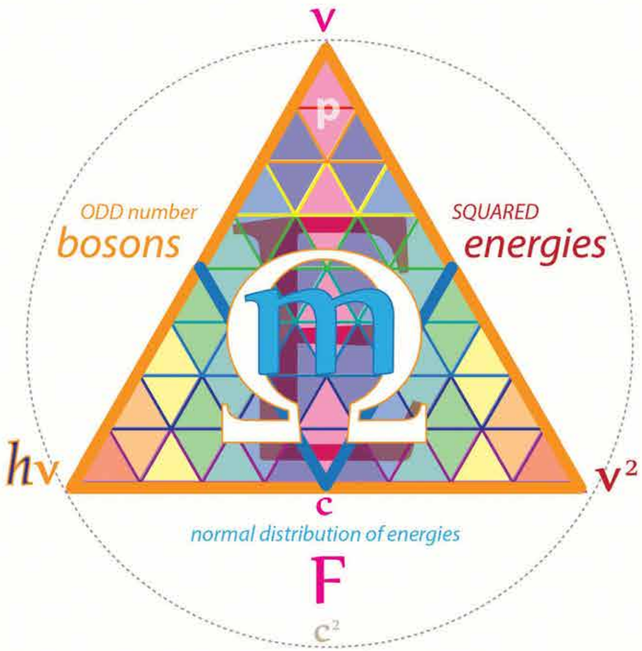
Leibniz

scalar energies

$$E = mv^2$$

mass-energy momenta relationship

square root equilateral energy is linear momentum



seconds

Newton

linear momentum

$$F = ma$$

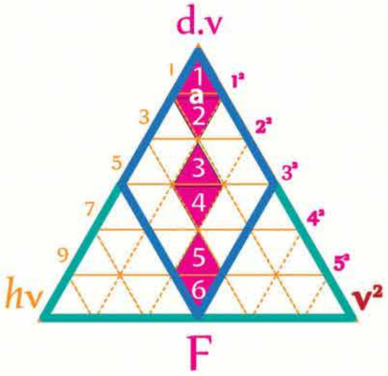
mass is a scalar constant relating Force to acceleration

$$F = m\frac{\Delta v}{\Delta t}$$

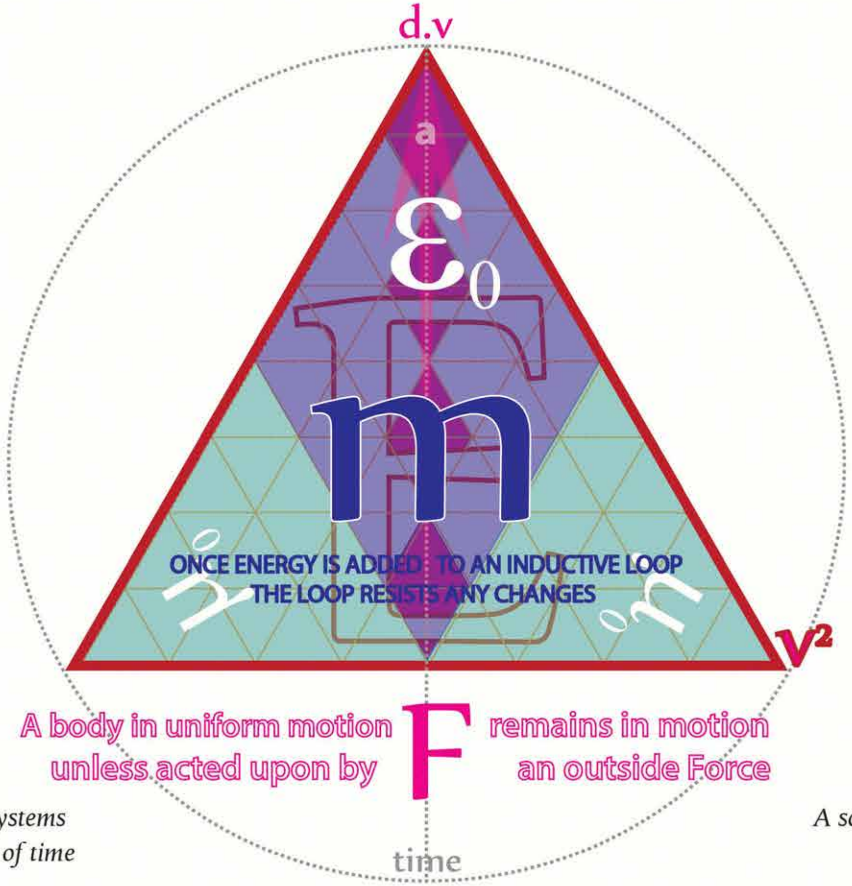
Planck quanta and their vector linear momentum
lie at 90 degrees to the angle use in the graphs of motion in calculus

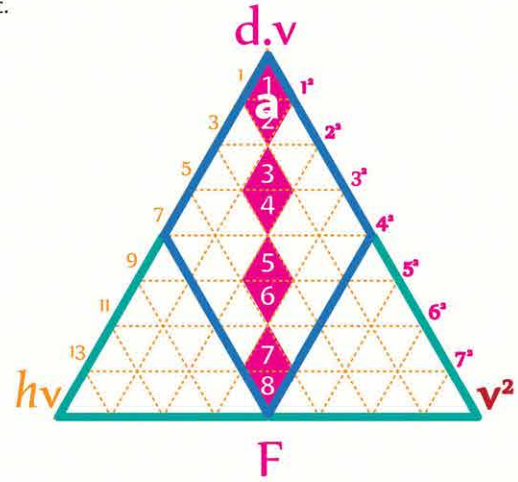
Differentiation

Differentiation is concerned with things like speeds and accelerations, slopes and curves etc.
These are Rates of Change, they are things that are defined locally.



An increase in a force opposing an object's vector velocity results in ***DECCELERATION***





An increase in a force in line with an object's vector velocity results in ***ACCELERATION***

A linear measure of Forces acting on physical systems resulting in changes to distance covered per unit of time

A scalar measure of Forces acting on physical systems resulting in changes to their rate of motion

$$v = \frac{\Delta d}{\Delta t}$$

$$= m/s$$

$$F = ma$$

In physics, the derivative of the displacement of a moving body with respect to time is the velocity of the body, and the derivative of velocity with respect to time is acceleration.

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

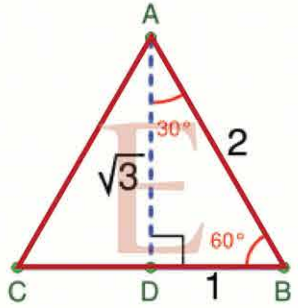
Newton's second law of motion states that the derivative of the momentum of a body equals the force applied to the body.

$$a = \frac{\Delta v}{\Delta t}$$

$$= m/s^2$$

Visualising the geometric half-truths of relativistic physics

The source of all the physical relationships of mass-energy momenta and the constants in Physics is the Equilateral Triangle (and all texts must be corrected)



Energy geometries within Physics including Special Relativity with its Lorentz corrections have historically been incorrectly illustrated through the geometry of right angled triangles

F

$$\sum \mathbf{F} = \frac{d\mathbf{P}}{dt} = m\frac{d\mathbf{v}}{dt} = m\mathbf{a}$$

$$\mathbf{F} = m\mathbf{a}\,.$$

Physics is geometry, one cannot be separated from the other

Equilateral geomtries lead to a intuitive understandings of Physics, Chemistry, Electrodynamics and Gravitation along with all the other apsects of Nature.

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

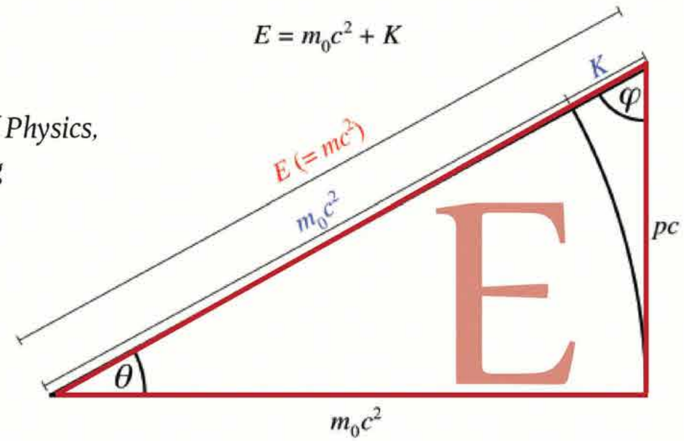
ENERGY

6.629432673 e-34 J

7.376238634 e-51 kg

momentum

$$p^2 = mv^2$$



$$E^2 = p^2c^2 + m_0^2c^4$$

Generalizing, we see that the square of the total energy, mass, or distance in spacetime is the sum of the components squared.

We can see an origin of distance in spacetime relating to velocity in pc in which Energy is subject to Lorentz corrections [v/c]

$$E = pc.$$

Additionally, EM mass can be directly related tot the Energy content of a body by the velocity of Energy

$$E = mc^2$$

Velocity

In physics, velocity is the measurement of the rate and direction of change in the position of an object.

It is a vector physical quantity; both magnitude and direction are required to define it.

The scalar absolute value (magnitude) of velocity is speed, a quantity that is measured in metres per second (m/s or ms–1) when using the SI (metric) system.

$$\frac{m}{s}$$

Speed is the scalar value of the Distance traveled per unit of TIme

$$\bar{\mathbf{v}} = \frac{\Delta \mathbf{x}}{\Delta t}.$$

Velocity is the vector value of the Distance traveled per unit of Time

$$\frac{\vec{m}}{s}$$

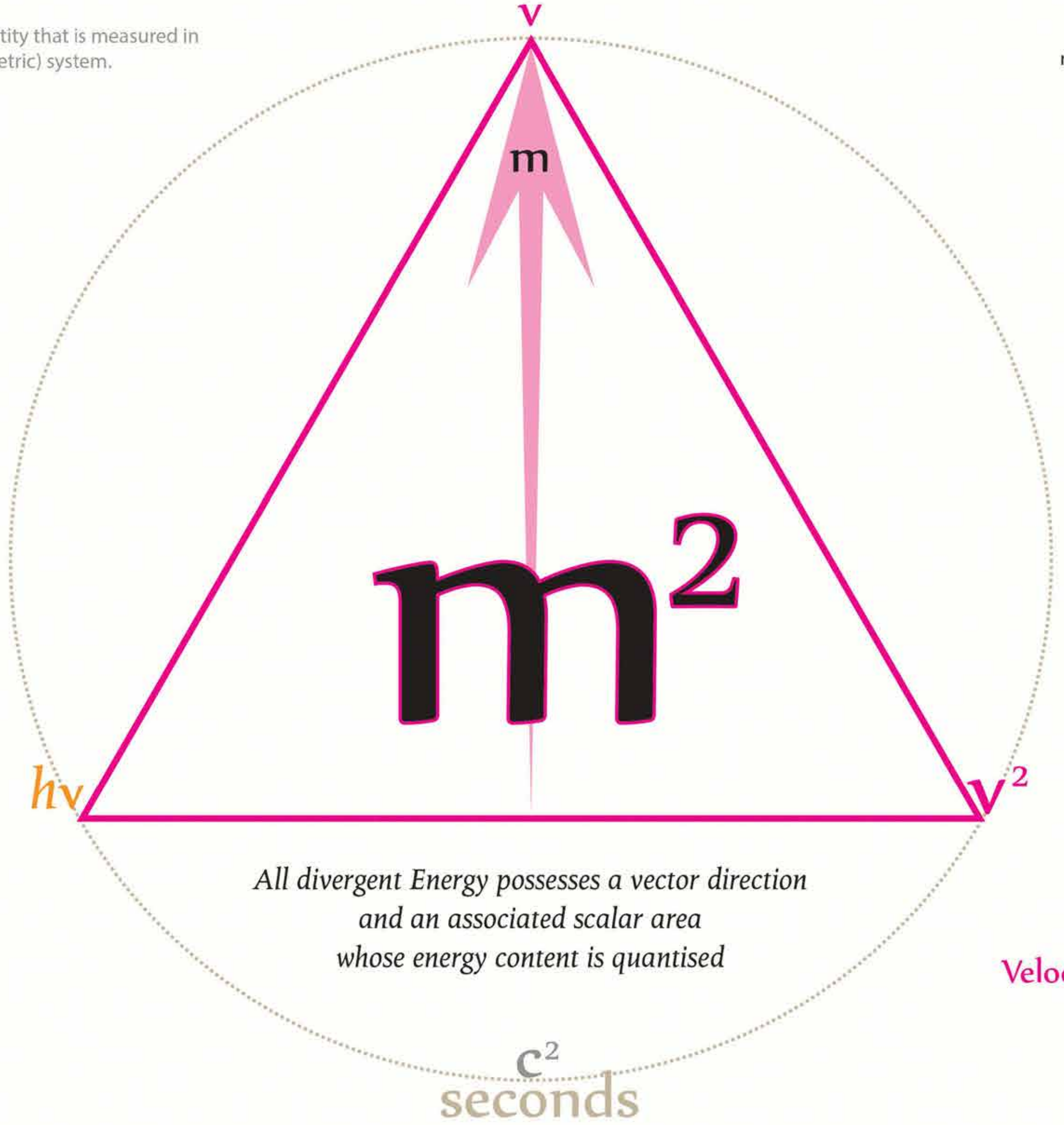
Velocity squared is the scalar value of the Distance traveled per unit of Time squared (Energy of a given spatial volume)

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

v Velocity $\frac{m}{s}$

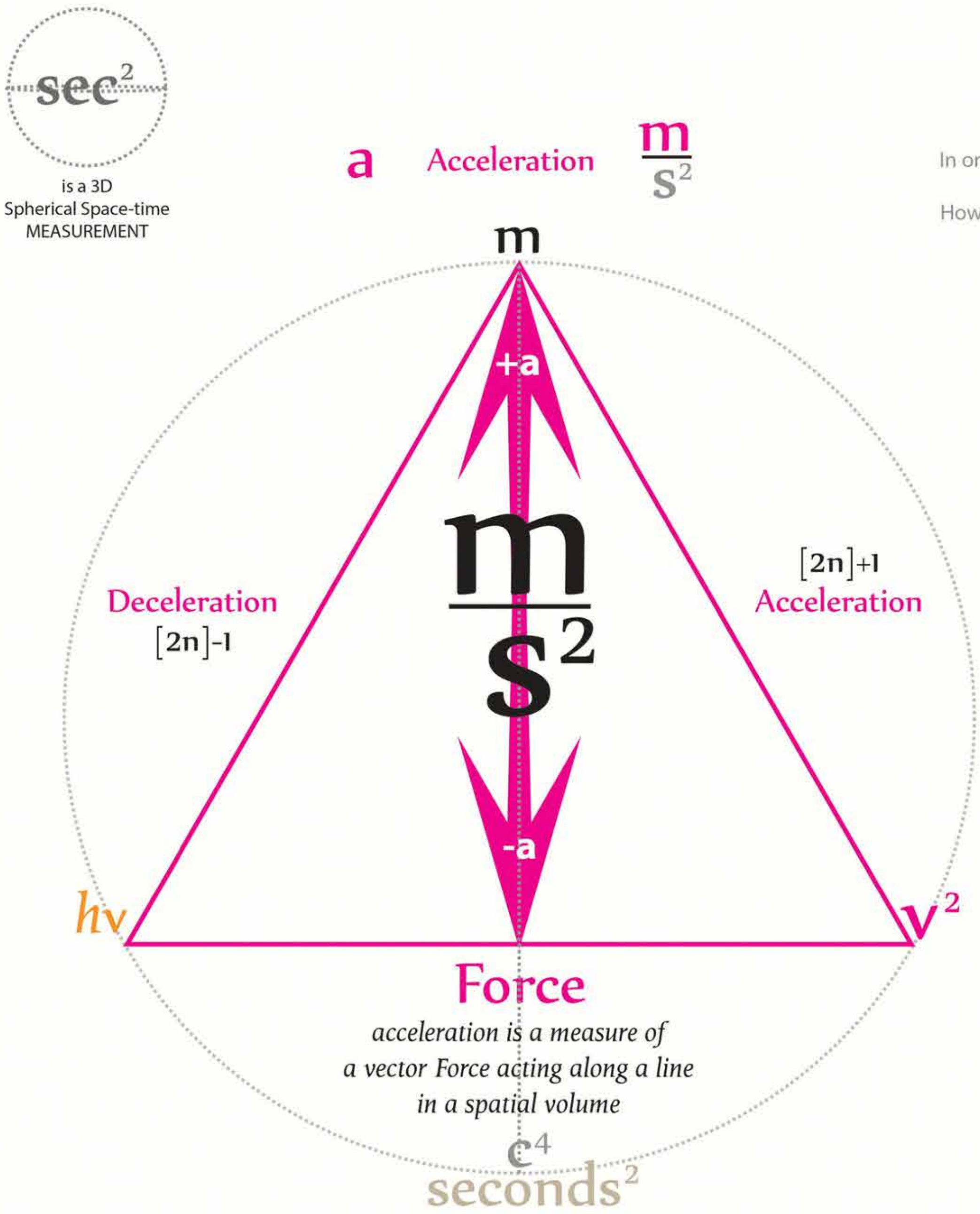
sec

is a 2D radial Space-time MEASUREMENT



Velocity squared

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



Acceleration

In physics, acceleration is the rate of change of velocity over time [dt]

In one dimension, acceleration is the rate at which something speeds up or slows down.

However, since velocity is a vector, acceleration describes the rate of change of both the magnitude and the direction of velocity.

Acceleration has the dimensions [Length]/[Time Squared]
In SI units, acceleration is measured in meters per second squared (m/s^2).

$$a = \frac{\Delta y}{\Delta x} = \frac{\Delta v}{\Delta t}.$$

In classical mechanics, for a body with constant mass, the acceleration of the body is proportional to the net force acting on it (Newton's second law)

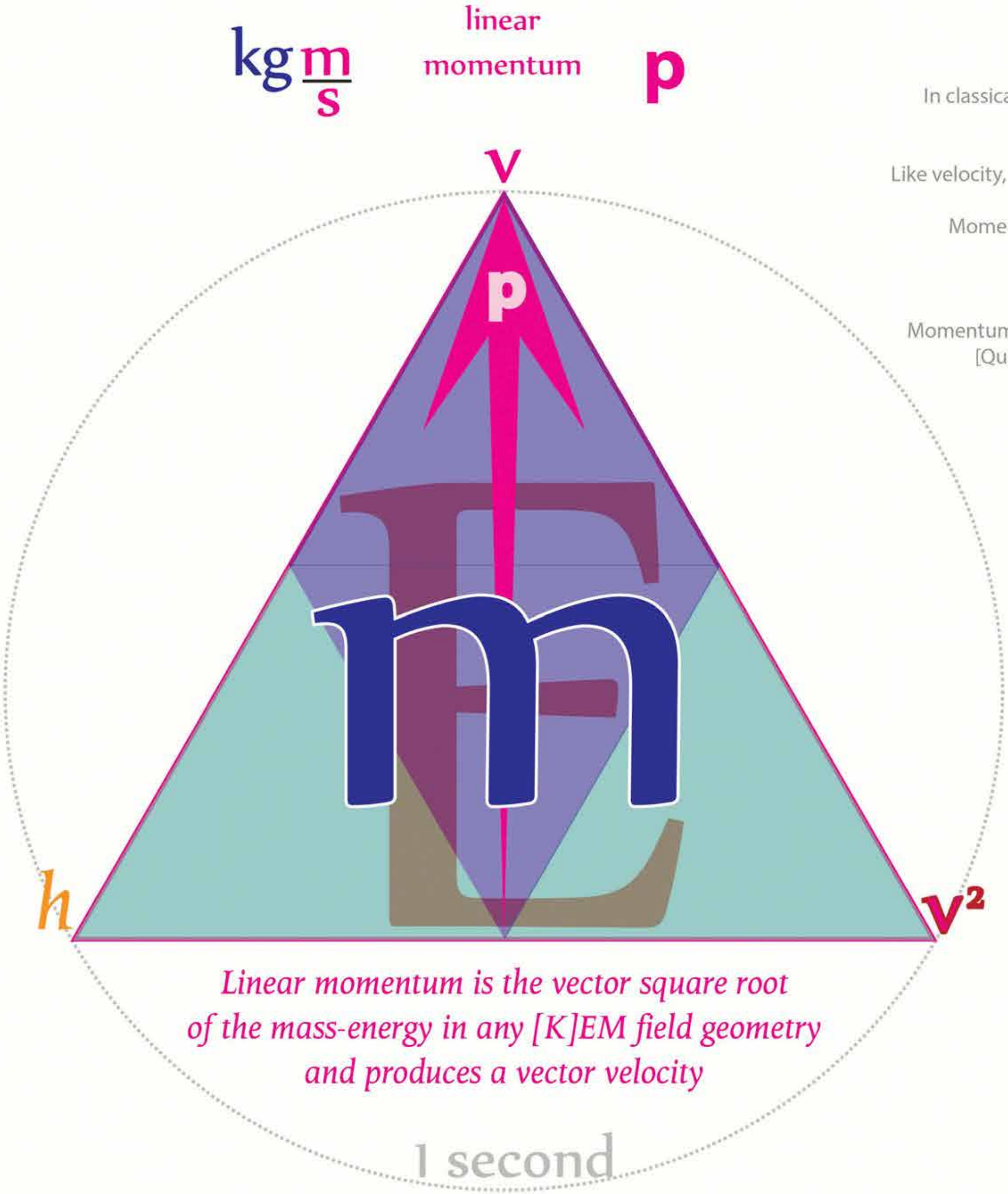
$$F = ma \longrightarrow a = F/m$$

Force

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

Additionally, for a mass with constant velocity,
(ie in an inertial frame)
the energy of motion is expressed as its momentum
(acceleration causes changes in Energy-momentum)

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



Linear momentum is the vector square root of the mass-energy in any [K]EM field geometry and produces a vector velocity

Momentum

In classical mechanics, momentum (pl. momenta; SI unit kg·m/s, or, equivalently, N·s) is the product of the mass and velocity of an object (p).

Like velocity, momentum is a vector quantity, possessing a direction as well as a magnitude.

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.

Momentum should be referred to in its specific forms to distinguish it in its various forms [Quantised Angular, Linear, Rotational and quantum/nuclear momentum]

$$p = \frac{hv^2}{v} = mv$$

Although originally expressed in Newton's Second Law, the conservation of momentum also holds in special relativity and, with appropriate definitions, a (generalized) momentum conservation law holds in electrodynamics, quantum mechanics, quantum field theory, and general relativity.

In relativistic mechanics, non-relativistic momentum is further multiplied by the Lorentz factor.

$$p^2 = E = mv^2$$

Energy can be expressed as the square of linear momentum

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

equilateral Planck energy momenta

$$m\Omega v^2$$

Energy-momentum relationship

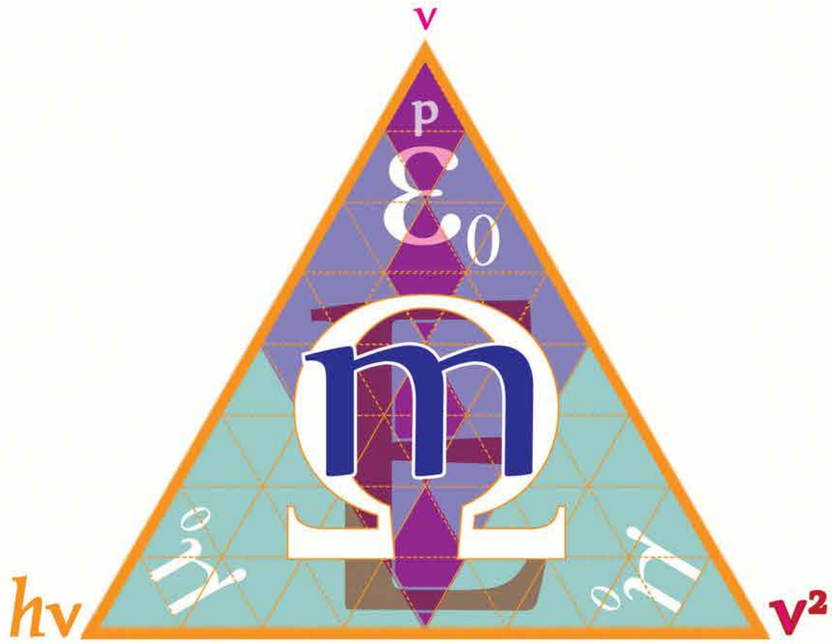
The total number of equilateral Planck quanta [quantised mass-energy momenta] is directly related to the square of its linear momentum [mass-velocity]

Quantum Mechanics

$$h = \frac{E}{v^2}$$

Quantised energy equilateral momenta

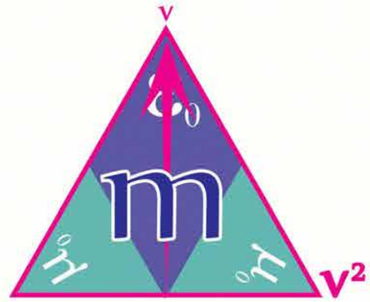
$$hv^2$$



Quantised Energy momenta is related to Scalar mass energy momenta through the equilateral geometry of Planck's constant

Newtonian physics

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



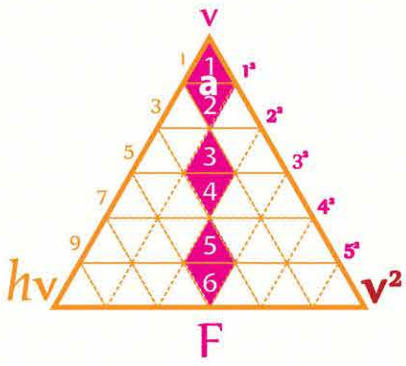
Scalar energy linear momentum

$$pv$$

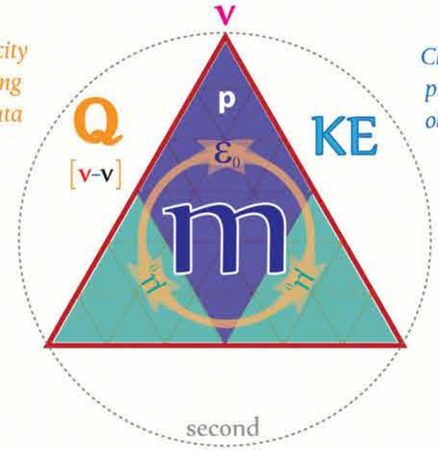
$$m\Omega v^2 = E = mv^2$$

Inertial resistance to Force

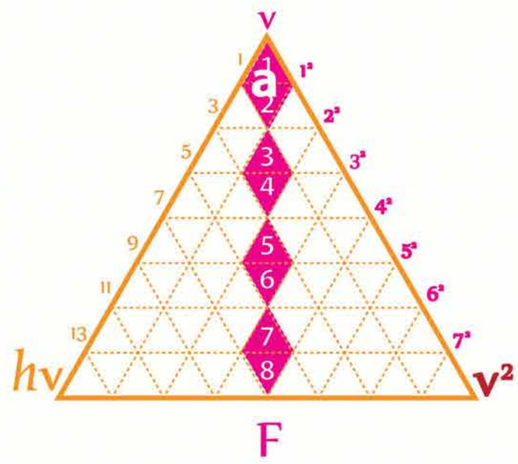
Inertia is the resistance of any physical object
to a change in its state of motion.



Changes to mass-velocity require a corresponding change to boson quanta



Changes to mass-velocity produces a change in an object's Kinetic Energies



$$E = mc^2$$

The total intrinsic momenta of all energy waveforms is the sum of their constituent Quantised Angular momenta (mass-energy momenta)

$$M_0 = m/c^2$$

$$KEM = Mv^2$$

Matter in motion has Kinetic Energies in addition to invariant rest mass-Energy

KE = RE - rest Matter

Any change in motion results in changes to
the Charge geometries creating in turn proportional
changes to KEM mass and momenta components

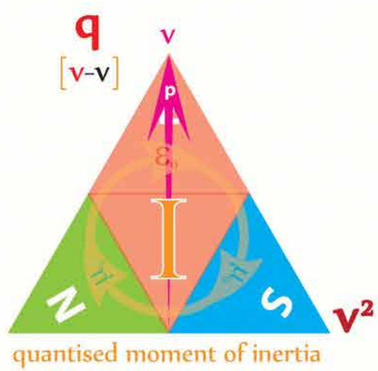
$$F = ma$$

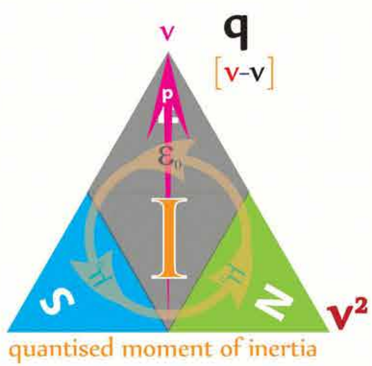
The 'inductive resistance' of Charge quanta fields to changes in their mass-energy momenta content is what we term Inertia

Any change to an object's velocity results in a corresponding change to its mass-Energy momenta which is reflected by its inertia

$$p^2 = E = mv^2$$

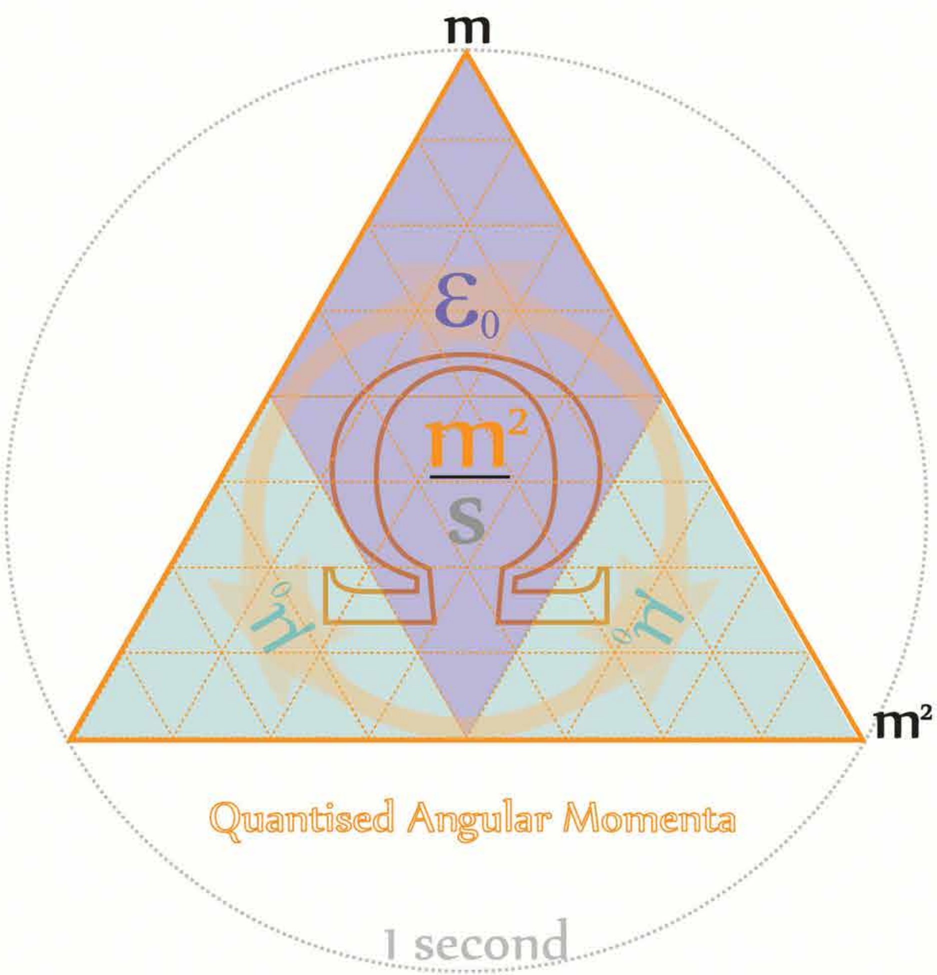
Inertial mass can be related to Charge through inductive Planck quanta





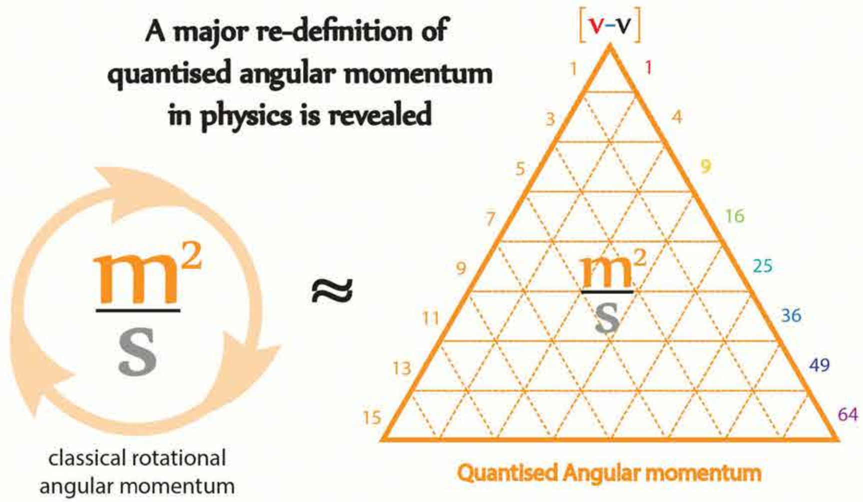
Quantised Angular momentum

As it is a physical [equilateral] geometry QAM is conservative in any system where there are no external Forces and serves as the foundational geometric source for all the conservation laws of physics



Angular momentum is sometimes described as the rotational analog of linear momentum, in Tetryonics it is revealed to be the equilateral geometry of quantised mass-energy momenta within any defined space-time co-ordinate system

A major re-definition of quantised angular momentum in physics is revealed



In quantum mechanics, angular momentum is quantised – that is, it cannot vary continuously, but only in ODD number "quantum steps" between the allowed SQUARE nuclear Energy levels

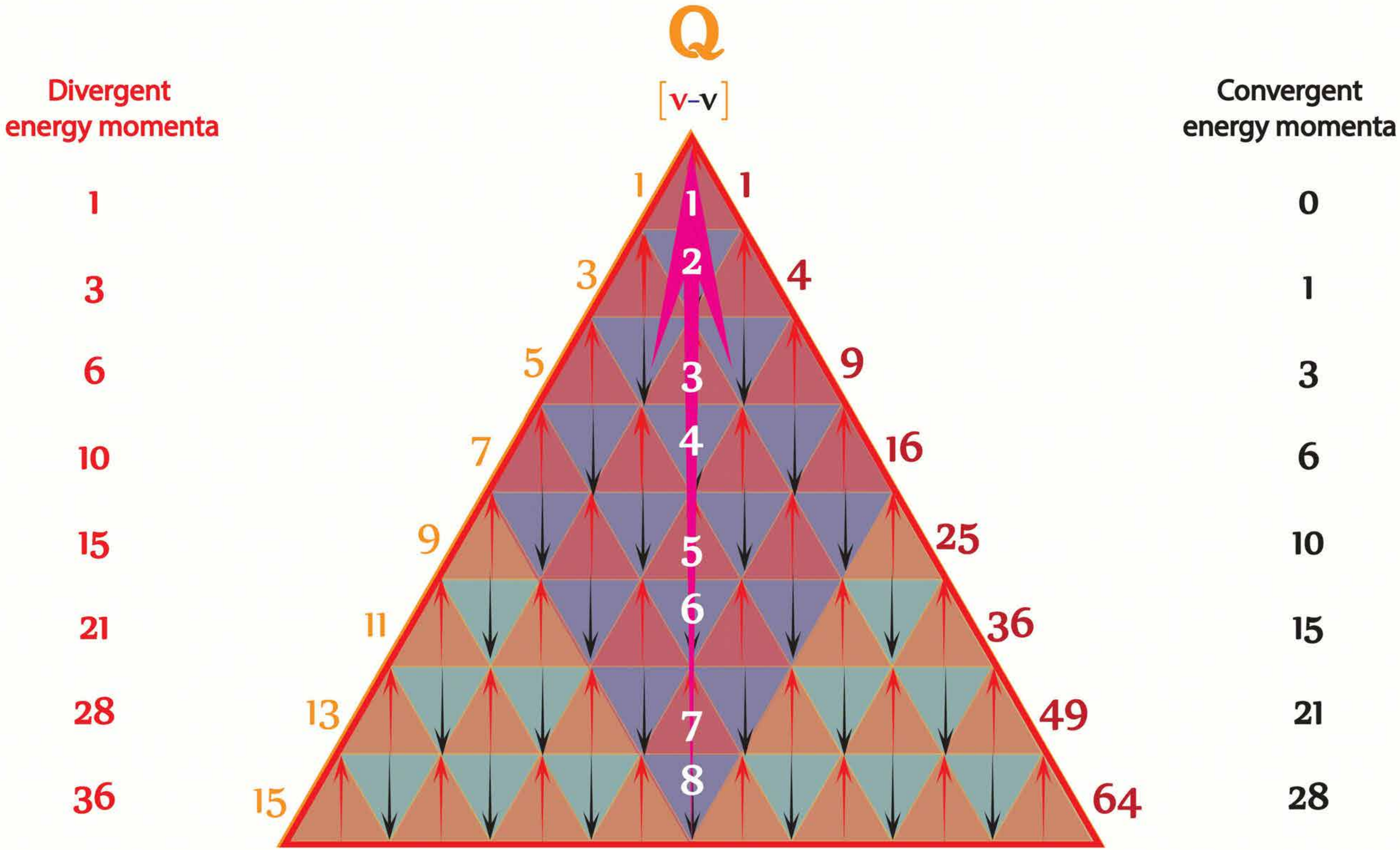
In physics, angular momentum, moment of momentum, or rotational momentum is a conserved vector quantity that can be used to describe the overall state of a physical system.

When applied to specific mass-Energy-Matter systems QAM reveals the true quantum geometry and nature of Energy in our universe

Normally viewed as an expression of rotational momentum Quantised Angular Momentum [QAM] is in fact a result of the equilateral geometric quantization of mass-energy

Charged geometries

All charge geometries are nett divergent

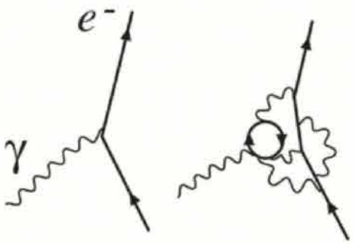


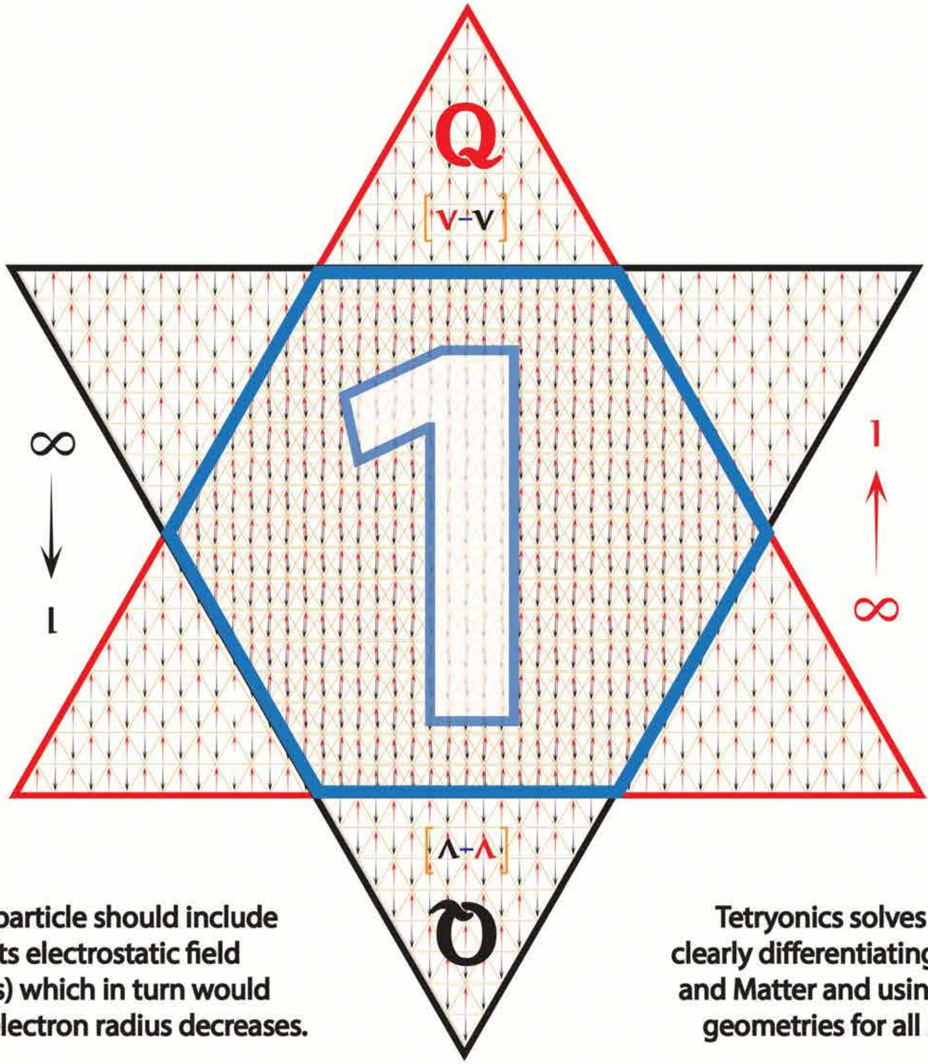
All charge geometries are comprised of finite equilateral energy momenta quanta

Renormalisation

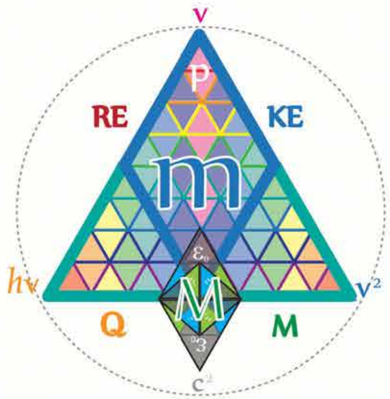
Renormalization was first developed in quantum electrodynamics (QED) to make sense of infinite integrals in perturbation theory. The problem of infinities first arose in the classical electrodynamics of point particles in the19th and later in the calculation of Gravitational fields in General Relativity in the early 20th century.

In QED Infinities must be cancelled





In Tetryonics Infinities do not exist



The mass of a charged particle should include the mass-energy in its electrostatic field (Electromagnetic mass) which in turn would approach infinity as the electron radius decreases.

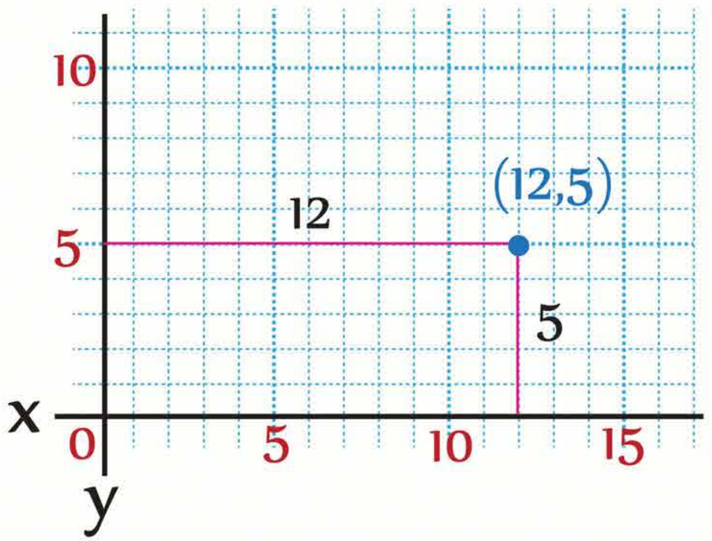
Tetryonics solves the problem by clearly differentiating between EM mass and Matter and using finite equilateral geometries for all Matter in motion

Initially viewed as a suspicious provisional procedure by some of its originators, renormalization was eventually embraced as an important and self-consistent tool in several fields of physics and mathematics.

2D space [c^2]

The adjective Cartesian refers to the French mathematician and philosopher René Descartes who developed the coordinate system in 1637

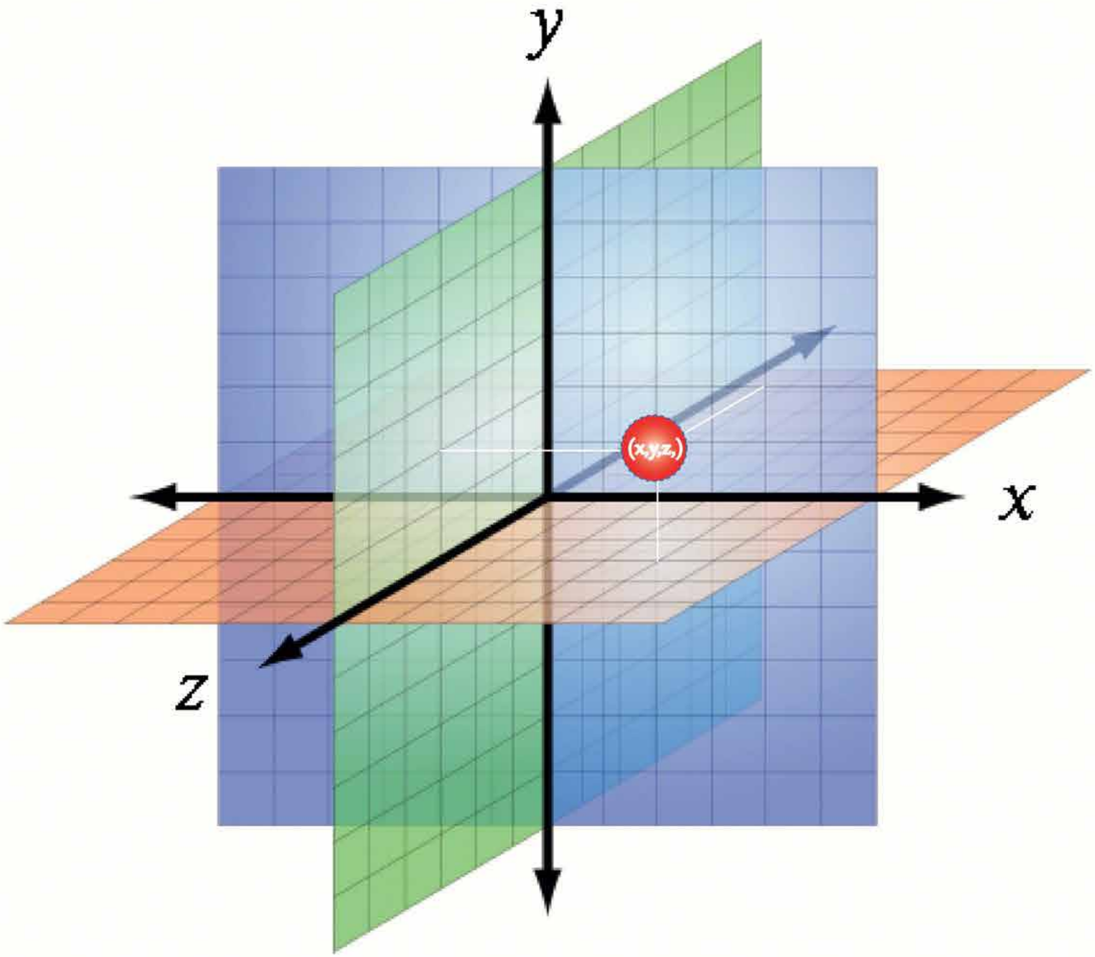
Since then many other coordinate systems have been developed such as the polar coordinates for the plane, and the spherical and cylindrical coordinates for three-dimensional space.



Cartesian coordinates are the foundation of analytic geometry, and provide enlightening geometric interpretations for many other branches of mathematics, such as linear algebra, complex analysis, differential geometry, multivariate calculus, group theory, and more

Mapping 3D spaces using Recti-linear co-ordinates

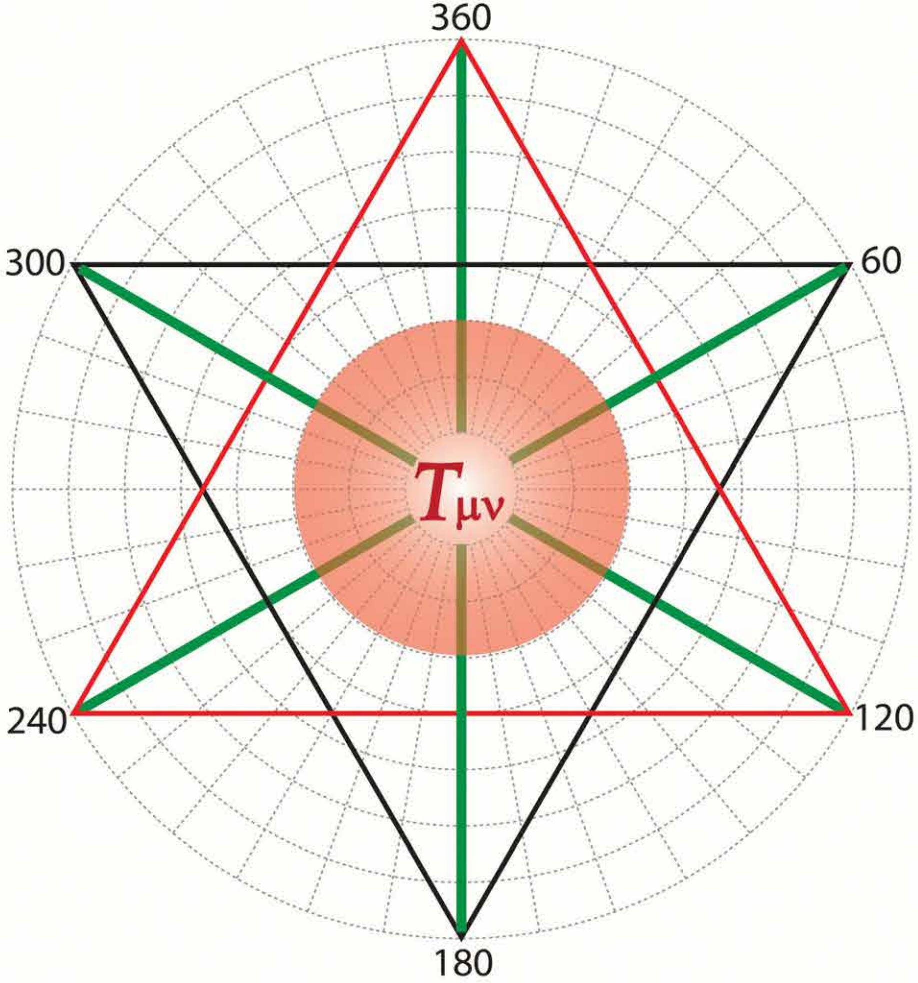
Cartesian coordinates can be defined as the positions of the perpendicular projections of a point onto the two or more axes, expressed as signed distances from the origin.



3D Cartesian co-ordinate [c^3] systems are distinct from spherical co-ordinate [c^4] systems

Polar co-ordinates

In mathematics, the polar coordinate system is a two-dimensional co-ordinate system in which each point on a plane is determined by a distance from a fixed point and an angle from a fixed direction.

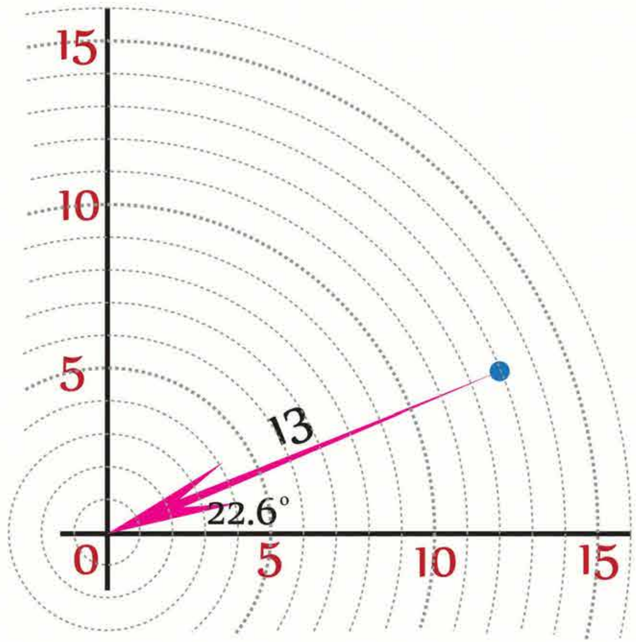


In geometry, curvilinear coordinates are a coordinate system for Euclidean space in which the co-ordinate lines may be curved.

Action Dynamics

Curvilinear co-ordinates may be derived from a set of rectilinear Cartesian coordinates by using a locally invertible transformation that maps one point to another in both systems

Metric Tensors



Gravitational acceleration

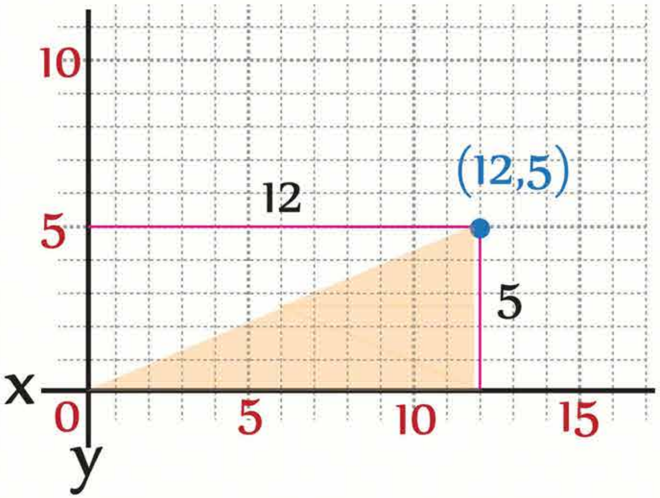
Polar or curvilinear co-ordinate systems are used extensively by Einstein in his theory of General Relavtivity

Reimannian curved space-time

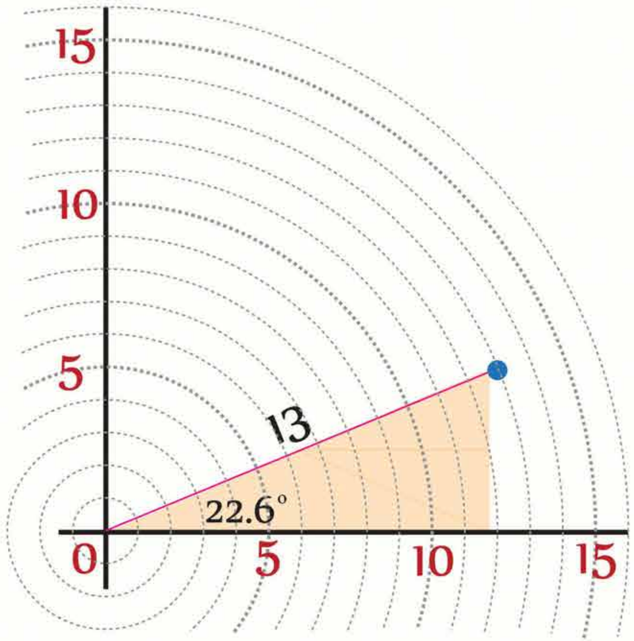
Co-ordinate transformations

There are many different possible coordinate systems for describing geometrical figures and they can all be related to one another.

Such relations are described by coordinate transformations which give formulas for the coordinates in one system in terms of the coordinates in another system



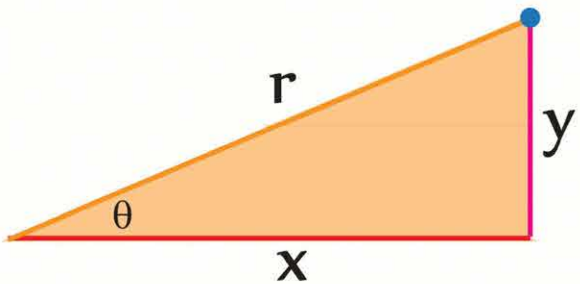
Converting between Polar and Cartesian coordinates



$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$= \tan^{-1}(5/12)$$

$$= 22.619$$



$$r^2 = 12^2 + 5^2$$

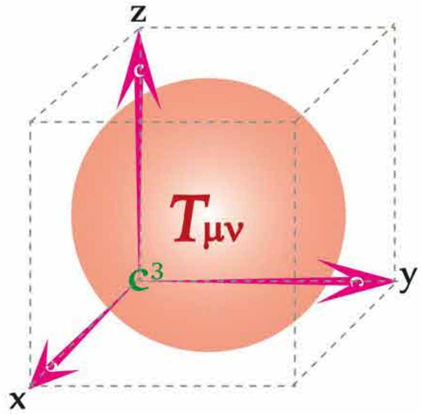
$$= \sqrt{169}$$

$$= 13$$

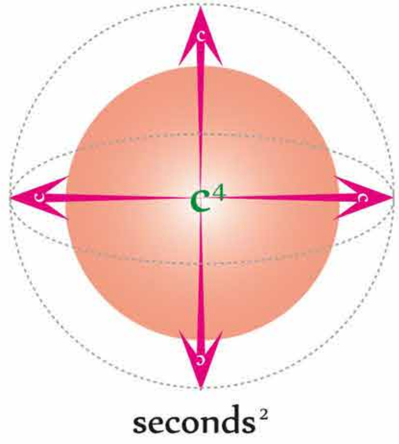
solving for the triangle using trigometric functions

Spatial co-ordinate systems

Cubic



Spherical



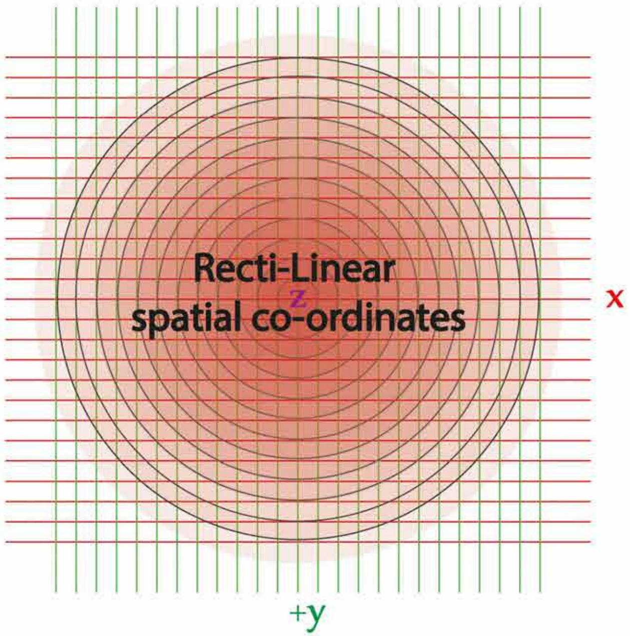
Spacetime is any mathematical co-ordinate system or model that combines space and time into a single continuum.

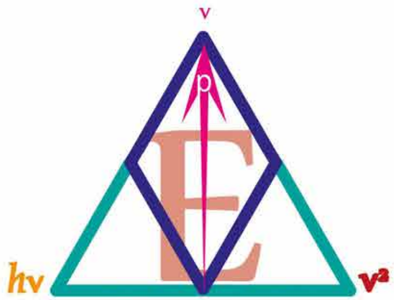
Spacetime is usually interpreted with space as being three-dimensional with time playing the role of a fourth dimension that is different from the spatial dimensions.

From a Euclidean space perspective, the universe has three spatial dimensions and one dimension of time [reflected by quantised angular momentum].

Tetryonics maps spatial co-ordinates through the momenta vectors of equilateral Energy

Cartesian Space-Time

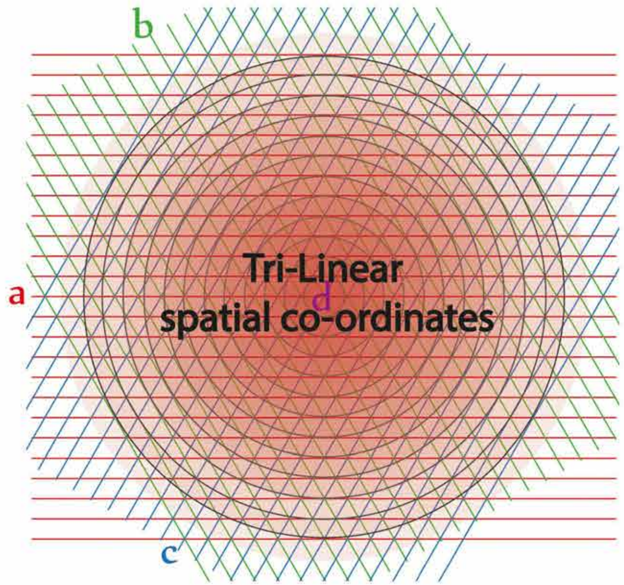




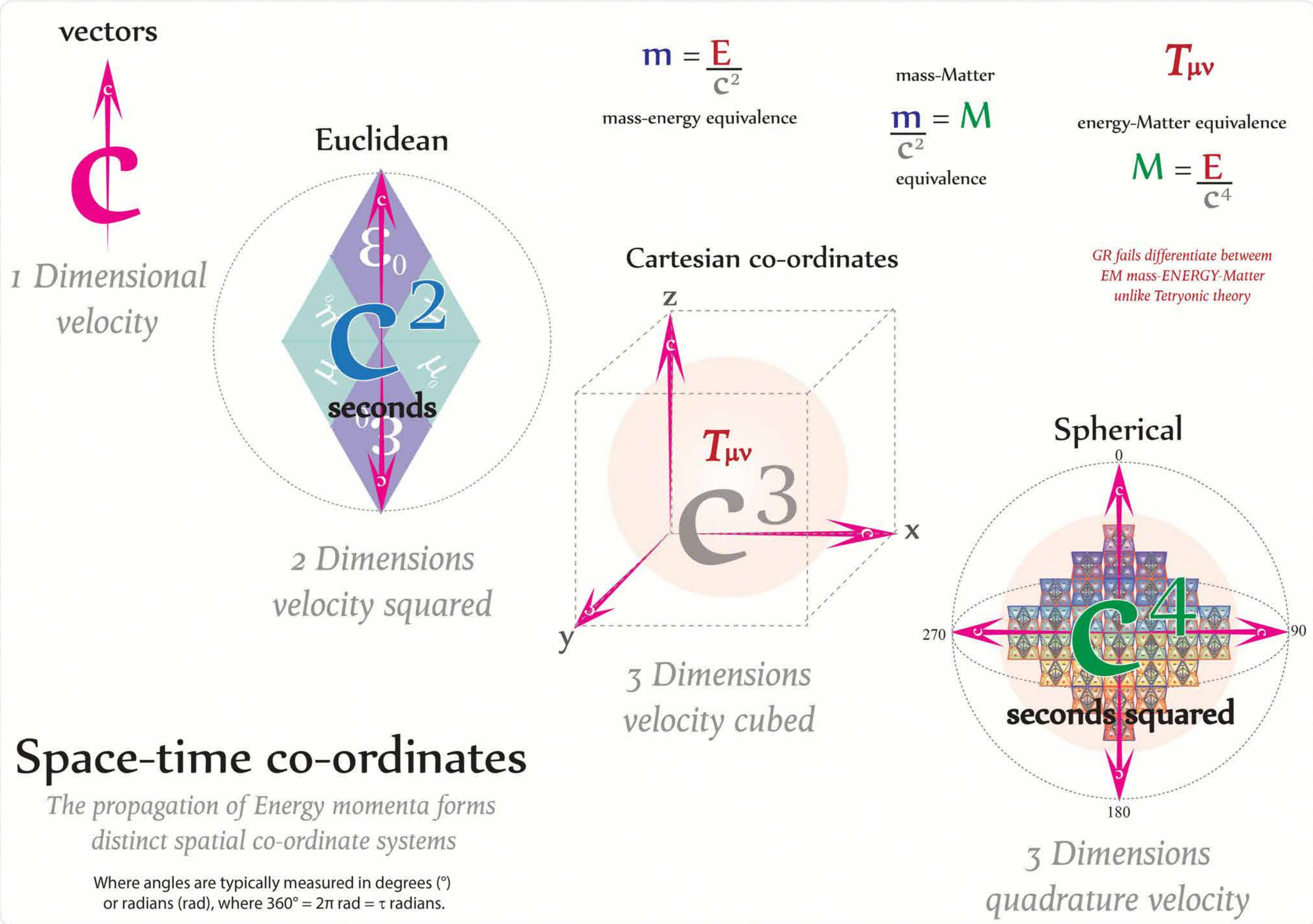
EM mass-ENERGY momenta are equilateral geometries

Mapping equilateral Energy geometries onto recti or curvi-linear spatial co-ordinate systems introduces mathematical complexity to a otherwise simplistic geometry for all EM mass-Energy-Matter interactions

Tetryonic Space-Time



In physics spatial co-ordinates to date have been based on Cartesian co-ordinates when in fact Energy momenta follow a Tri-Linear co-ordinate geometry

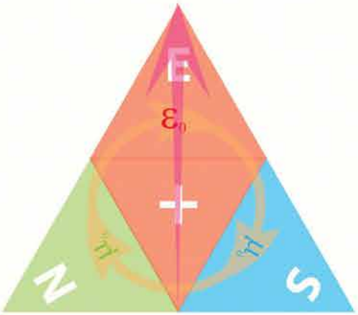

vectors
c
1 Dimensional velocity
Euclidean
ε_0
c^2
seconds
2 Dimensions velocity squared
m = E / c²
mass-energy equivalence
mass-Matter
m / c² = M
equivalence
Tμν
energy-Matter equivalence
M = E / c⁴
GR fails differentiate betweem EM mass-ENERGY-Matter unlike Tetryonic theory
Cartesian co-ordinates
z
x
y
Tμν
c³
3 Dimensions velocity cubed
Spherical
0
90
180
270
c⁴
seconds squared
3 Dimensions quadrature velocity
Space-time co-ordinates
The propagation of Energy momenta forms distinct spatial co-ordinate systems
Where angles are typically measured in degrees (°) or radians (rad), where 360° = 2π rad = τ radians.

Energy per second

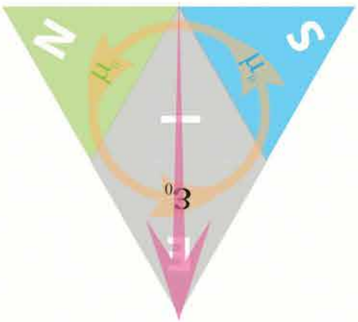
Tetryonic co-ordinate systems

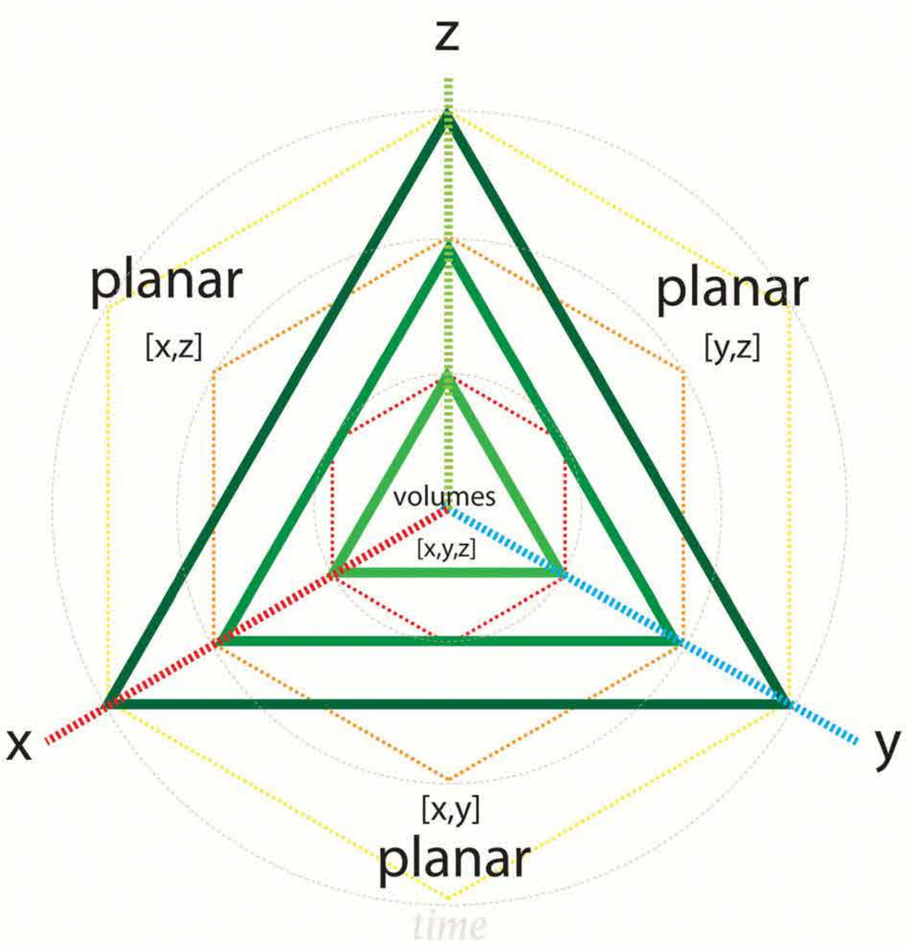
Energy per second squared

m



2D mass-energy geometries



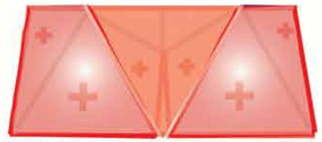


Planar mass-energy geometries have no z-components

Differentiation between 2D mass-energy & 3D Matter is key to extending our understanding of physics

Matter topologies have z-components

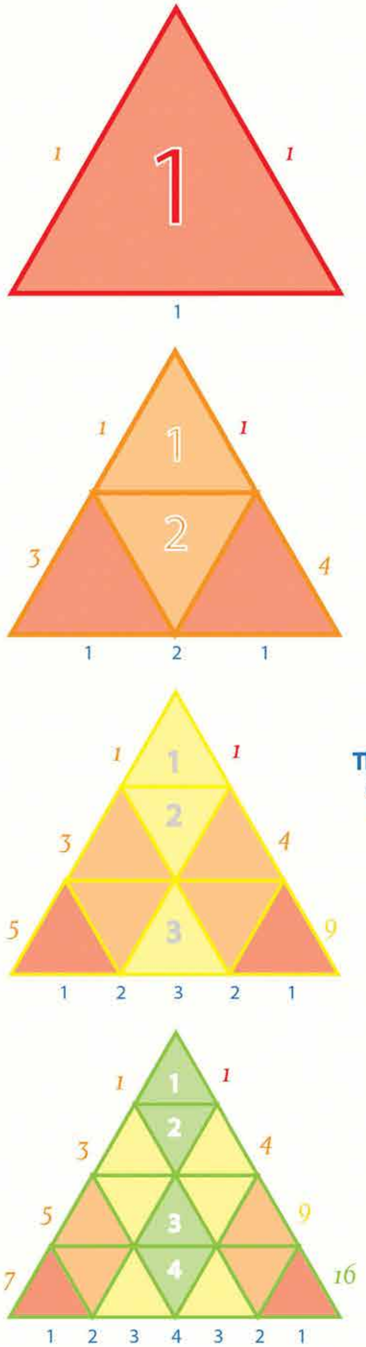
M

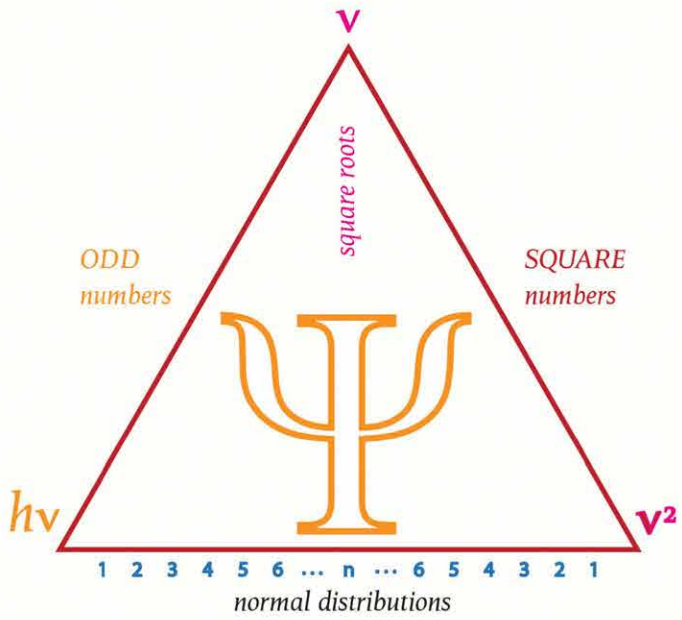


Proton

3D Matter topologies

Neutron



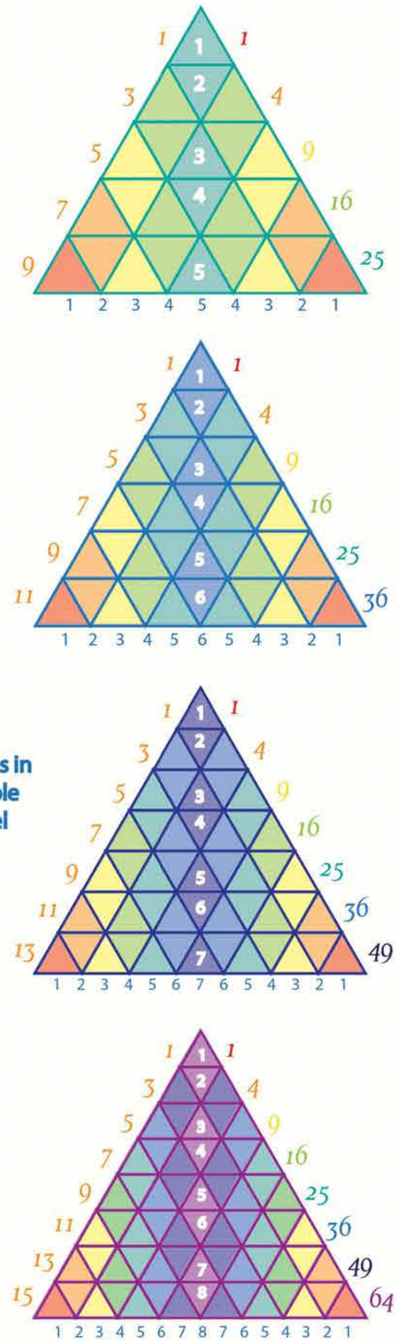


Quantum probability distributions

The equilateral geometry and distribution of quantised Energy momenta provides the basis for all statistical probabilities in Quantum mechanics, thermodynamic & information entropy - including a solution to Heisenberg's Uncertainty Principle thus paving the way forward for a new understanding, and manipulation of physical phenomena at the quantum level

1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
1 2 3 4 5 6 5 4 3 2 1
1 2 3 4 5 6 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1

Normal distributions are extremely important in statistics, and are often used in the natural and social sciences for real-valued random variables whose distributions are not known



Quantum Probability Distributions

The normal distribution is a probability distribution.
It is also called Gaussian distribution because it was discovered by Carl Friedrich Gauss.

x/n^2

Probabilities are the square of the Amplitude

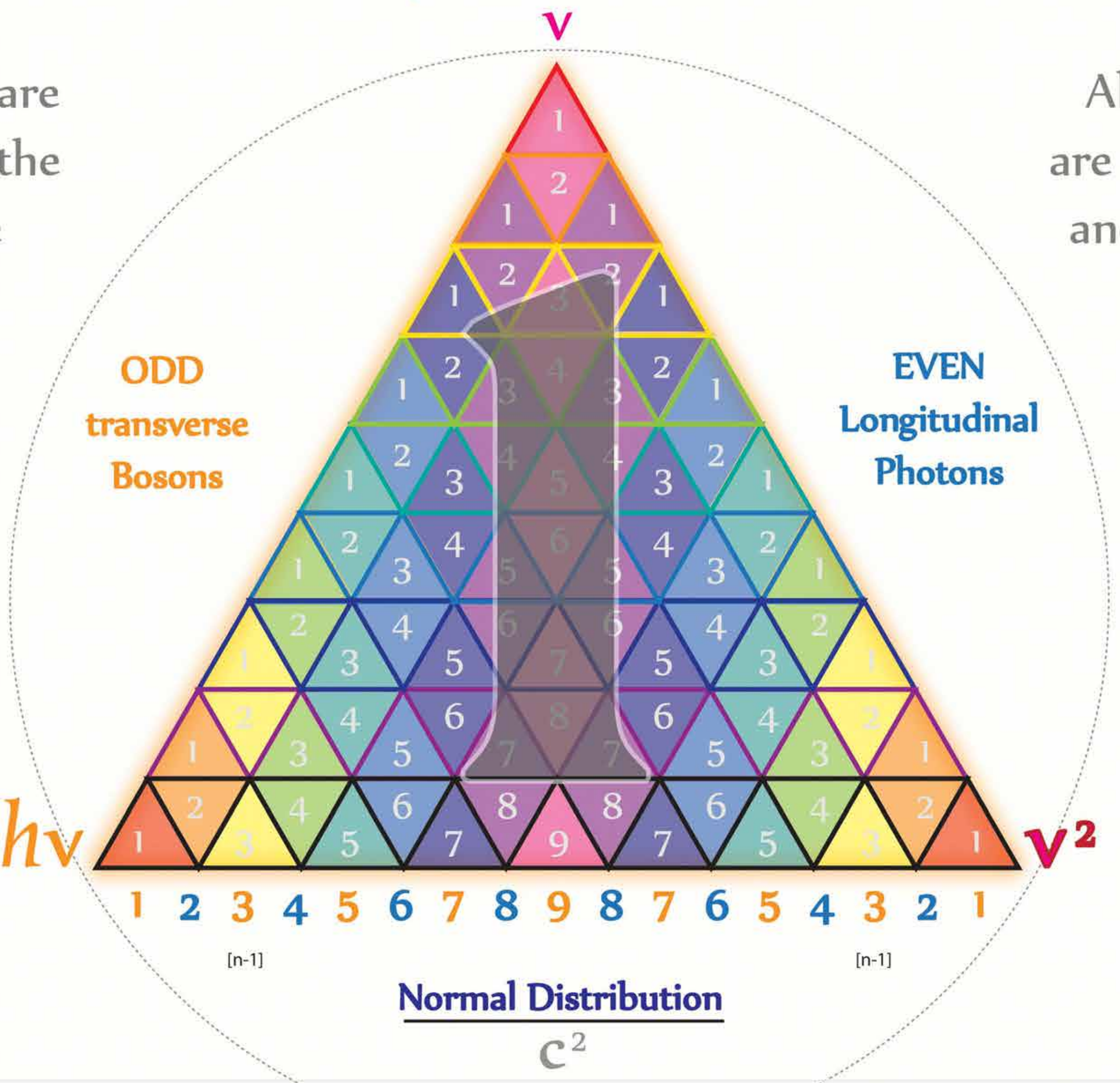
n

$\Sigma\ x/n^2$

All probabilities are re-normalisable and sum to Unity

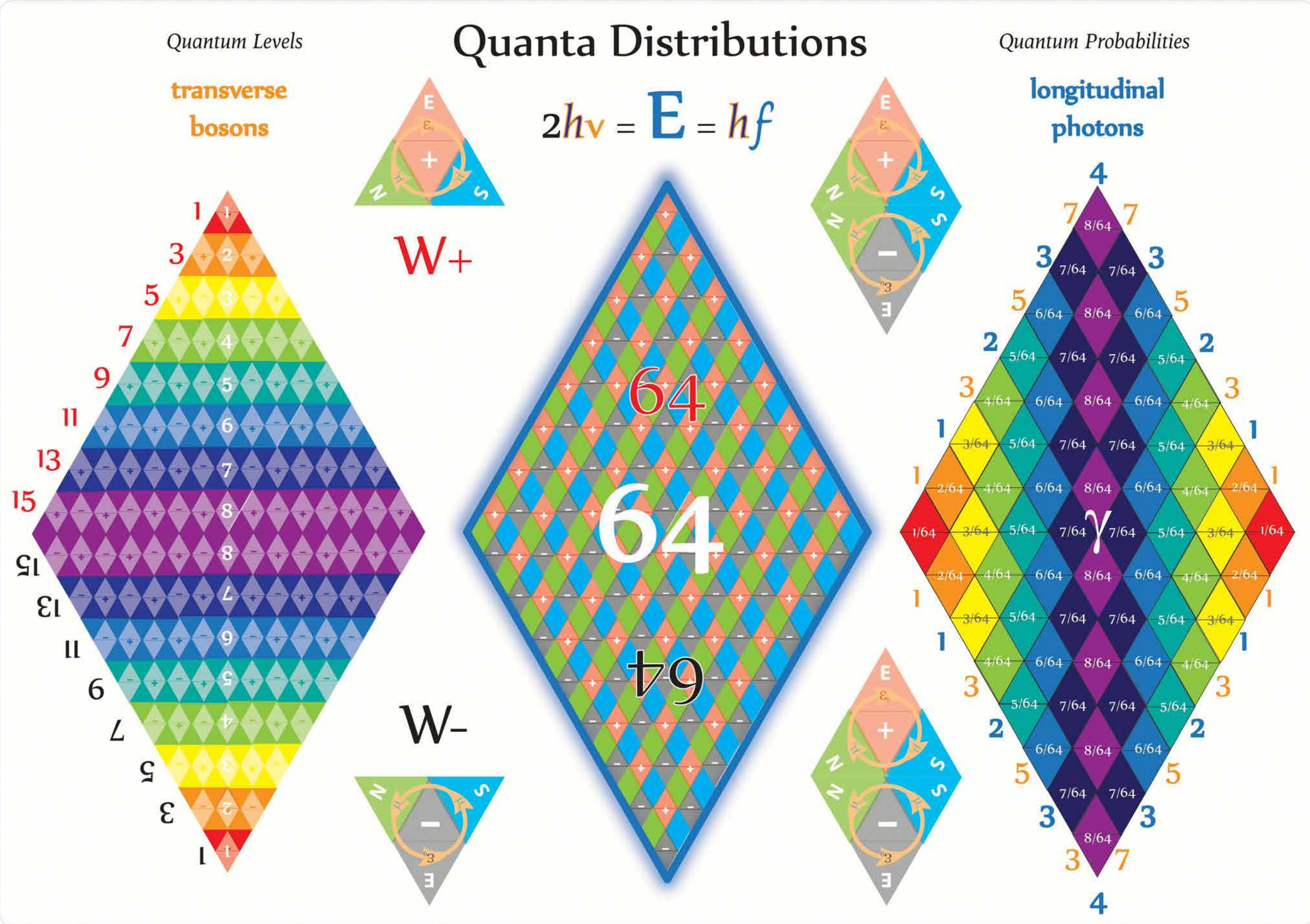
1

square root momenta

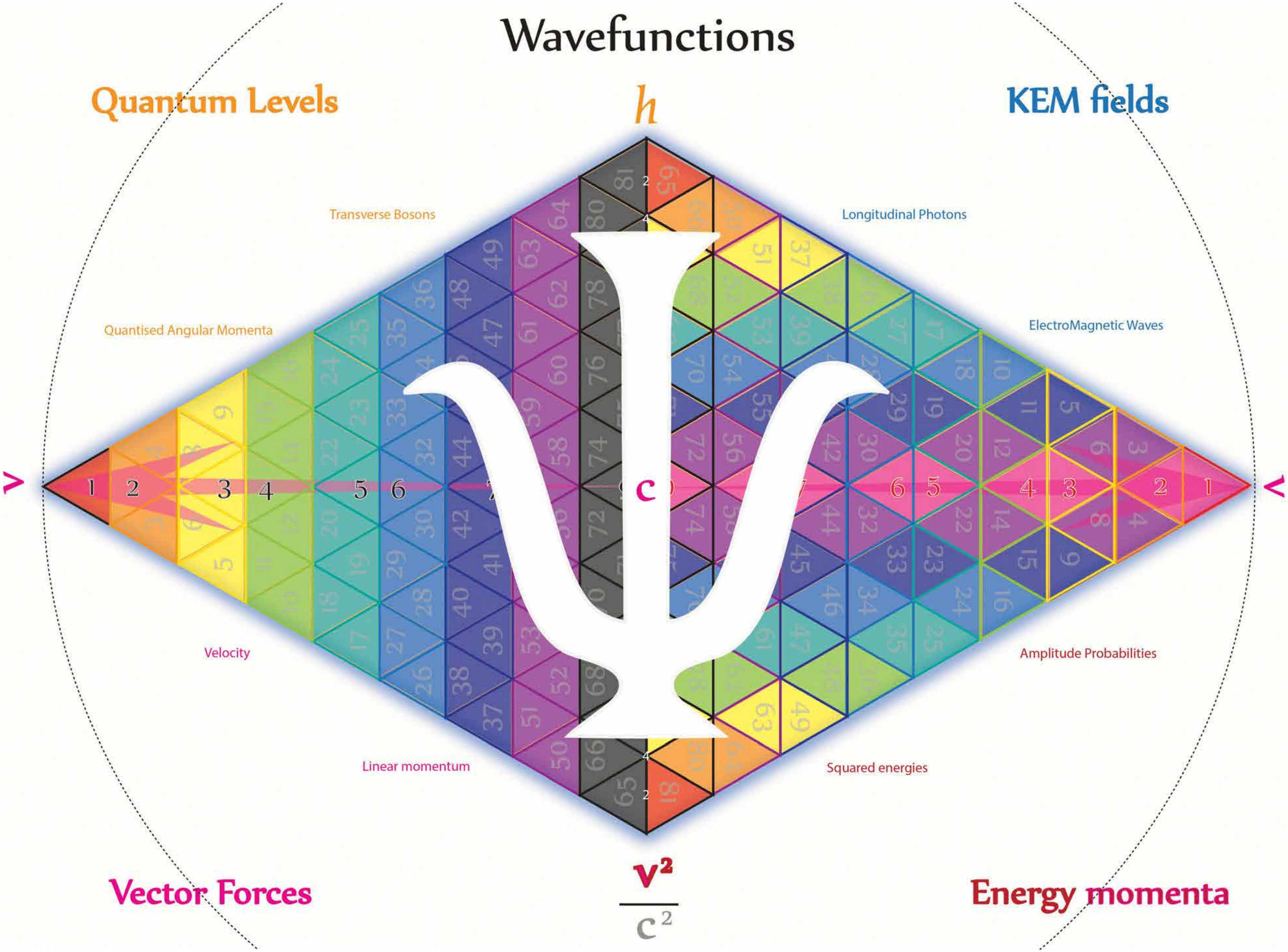


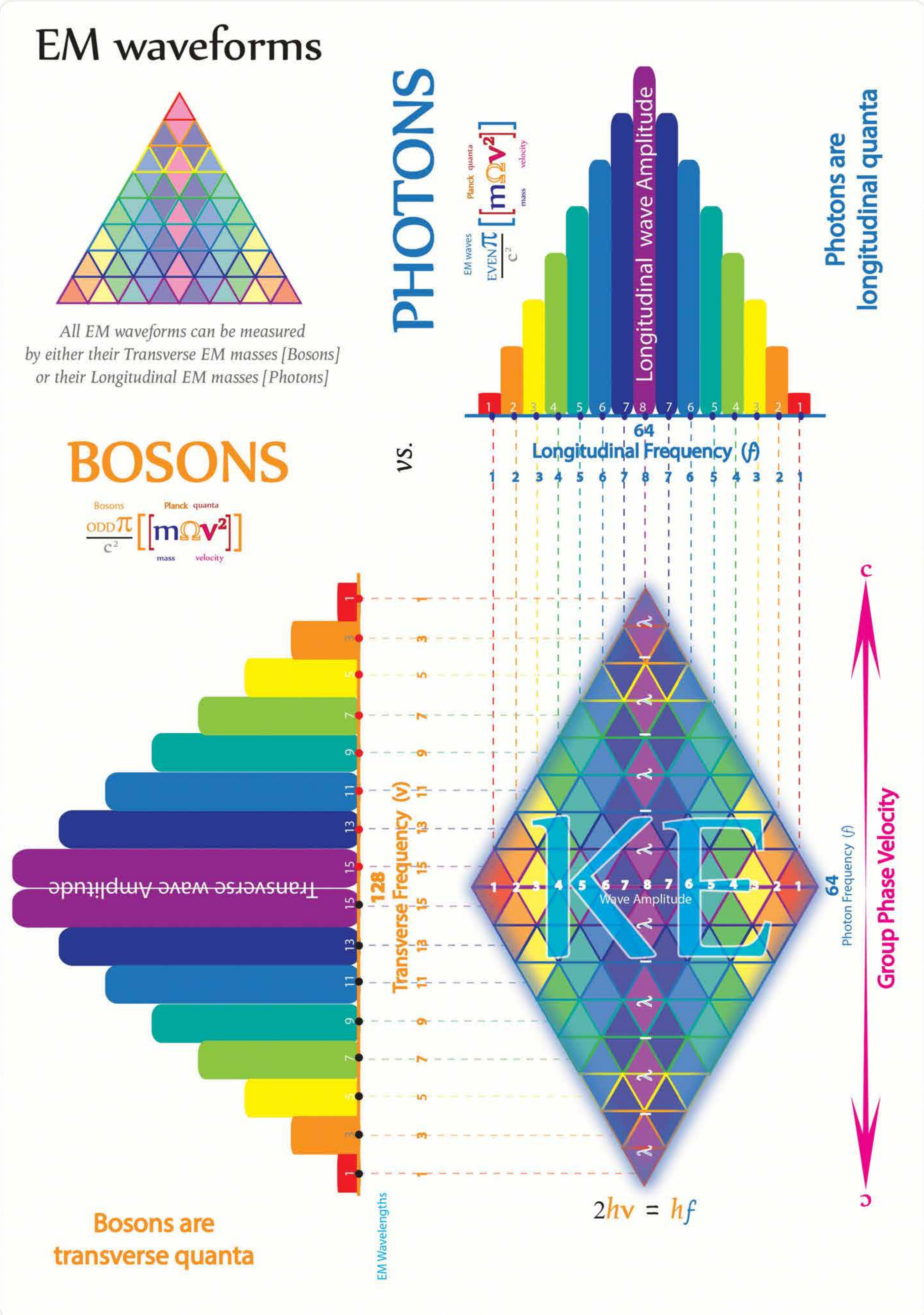
Planck quanta

Square energies

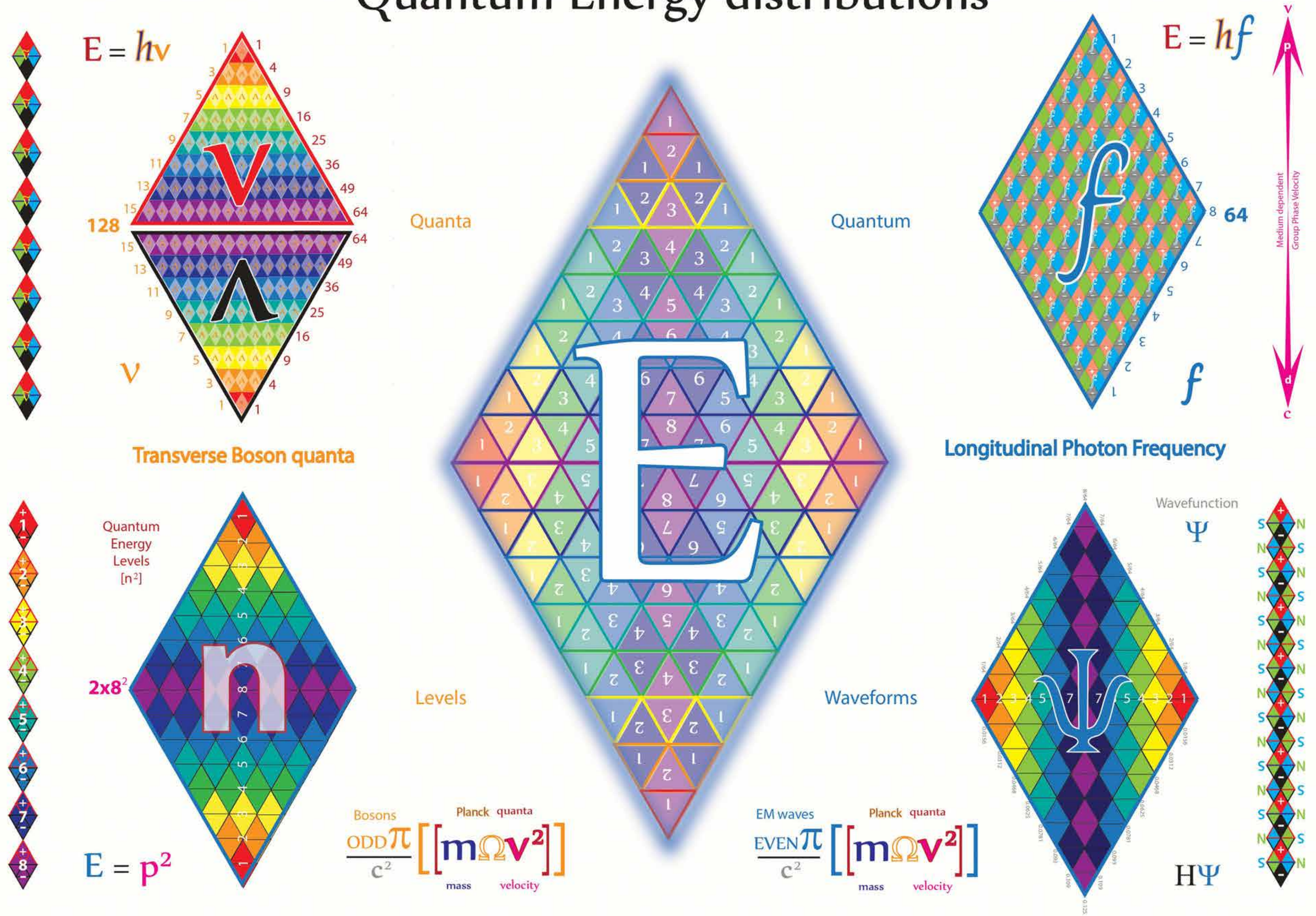

Quanta Distributions
Quantum Levels
transverse
bosons
Quantum Probabilities
longitudinal
photons
2hv = E = hf
W+
W-
64
64
64
γ
1/64
2/64
3/64
4/64
5/64
6/64
7/64
8/64

Wavefunctions




EM waveforms
All EM waveforms can be measured
by either their Transverse EM masses [Bosons]
or their Longitudinal EM masses [Photons]
PHOTONS
EM waves
Planck quanta
EVEN π / c² [[mΩv²]]
mass
velocity
Longitudinal wave Amplitude
Photons are longitudinal quanta
64
Longitudinal Frequency (f)
vs.
BOSONS
Bosons
Planck quanta
ODD π / c² [[mΩv²]]
mass
velocity
Transverse wave Amplitude
128
Transverse Frequency (v)
KE
Wave Amplitude
64
Photon Frequency (f)
Group Phase Velocity
c
c
2hv = hf
Bosons are transverse quanta
EM Wavelengths

Quantum Energy distributions



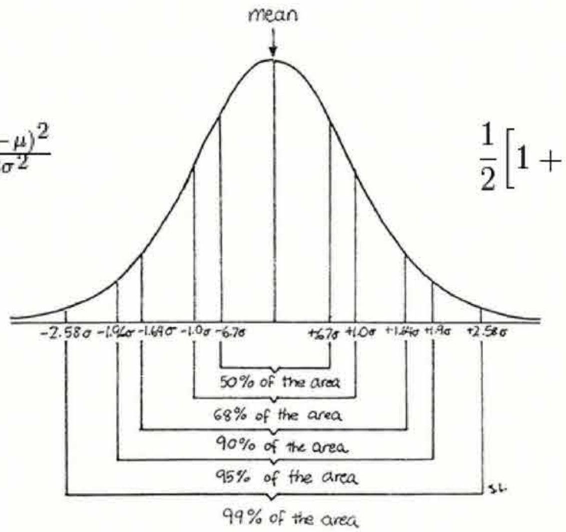
Normal Distributions

The Gaussian distribution sometimes informally called the bell curve.

Pierre de Fermat

Pierre de Fermat is given credit for early developments that led to infinitesimal calculus.

$$\frac{1}{\sqrt{2\pi\sigma^2}}\, e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$



$$\frac{1}{2}\left[1+\operatorname{erf}\left(\frac{x-\mu}{\sqrt{2\sigma^2}}\right)\right]$$

Leonhard Euler

Leonhard Euler developed a formula which links complex exponentiation with trigonometric functions

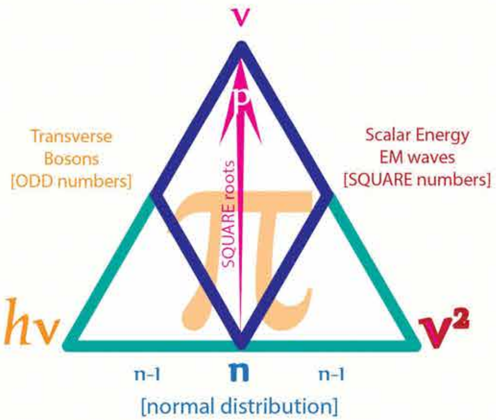
all ODD numbers are

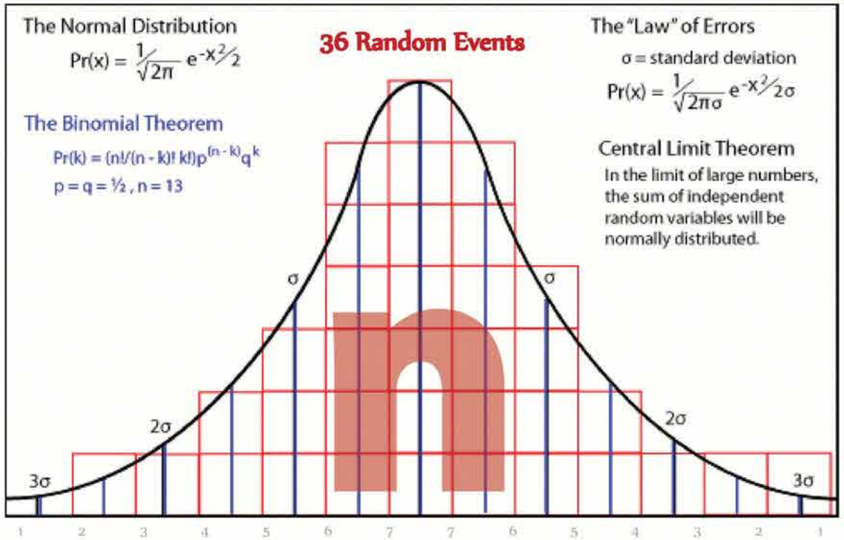
$$a^2 - b^2 = [a-b].[a+b]$$

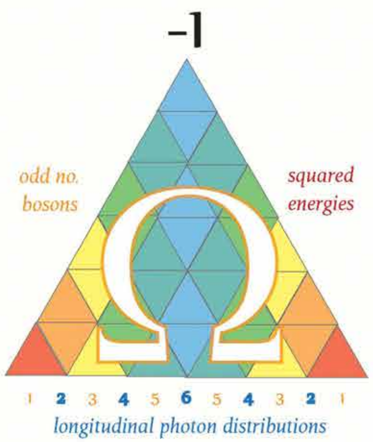
the difference of two squares

A bell shaped curve defines the standard normal distribution, in which the probability of observing a point is greatest near the average, and declines rapidly as one moves away from the mean.

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







In probability theory, the normal (or Gaussian) distribution is a continuous probability distribution that has a bell-shaped probability density function, known as the Gaussian function

Fundamental theorem of Energy momenta

A nth level scalar energy momenta waveform has exactly n linear momentum in unit circle co-ordinate systems
(with Longitudinal and Transverse equilateral Planck waveforms being orthogonal to each other)

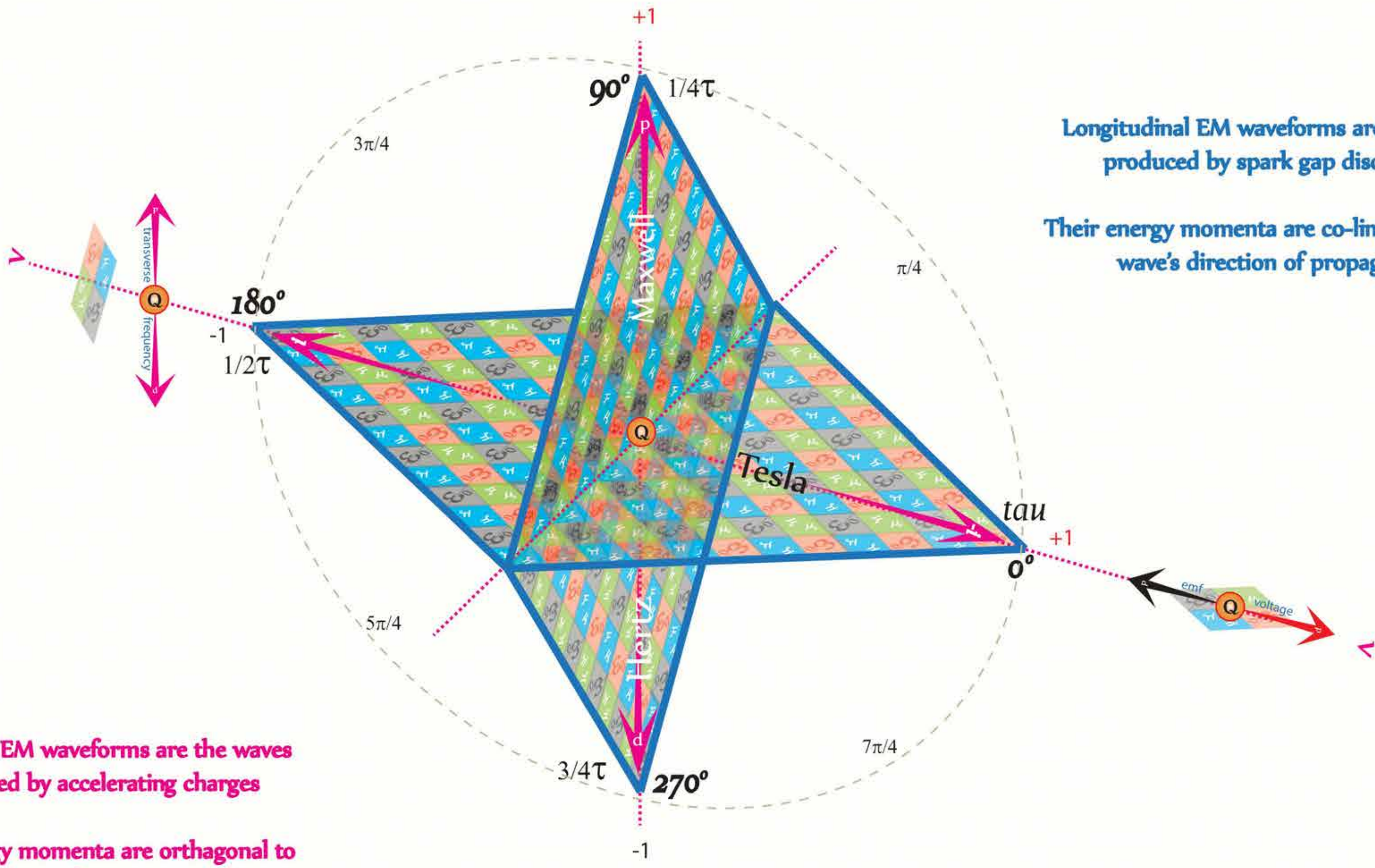
scalar energies

E

mv^2

Longitudinal EM waveforms are the waves produced by spark gap discharges

Their energy momenta are co-linear with the wave's direction of propagation



p

mv

linear momentum

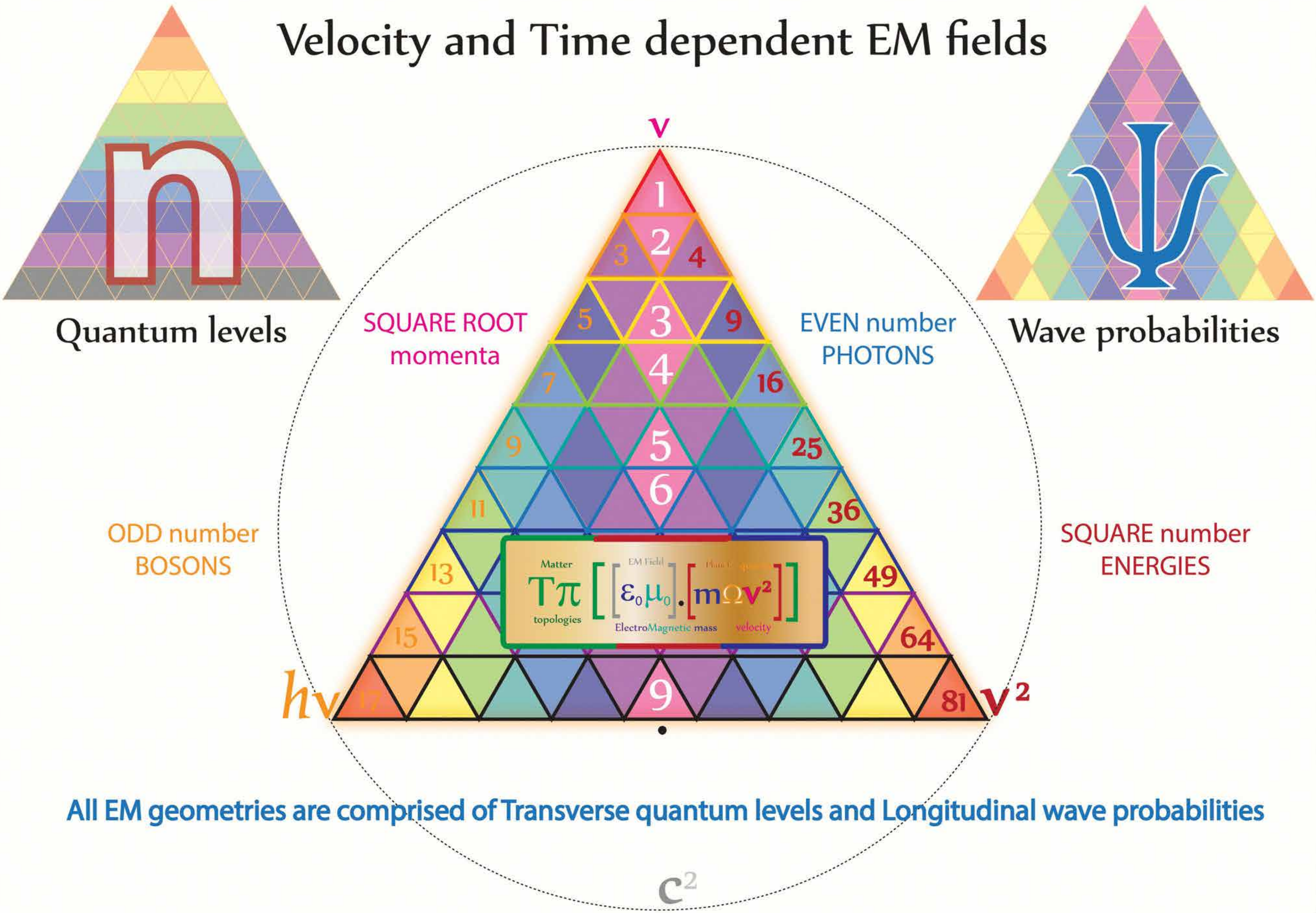
Transverse EM waveforms are the waves produced by accelerating charges

Their energy momenta are orthogonal to the direction of wave propagation

[Mathematics] *i* or *j* [Electrical theory]

square root of negative one

Velocity and Time dependent EM fields

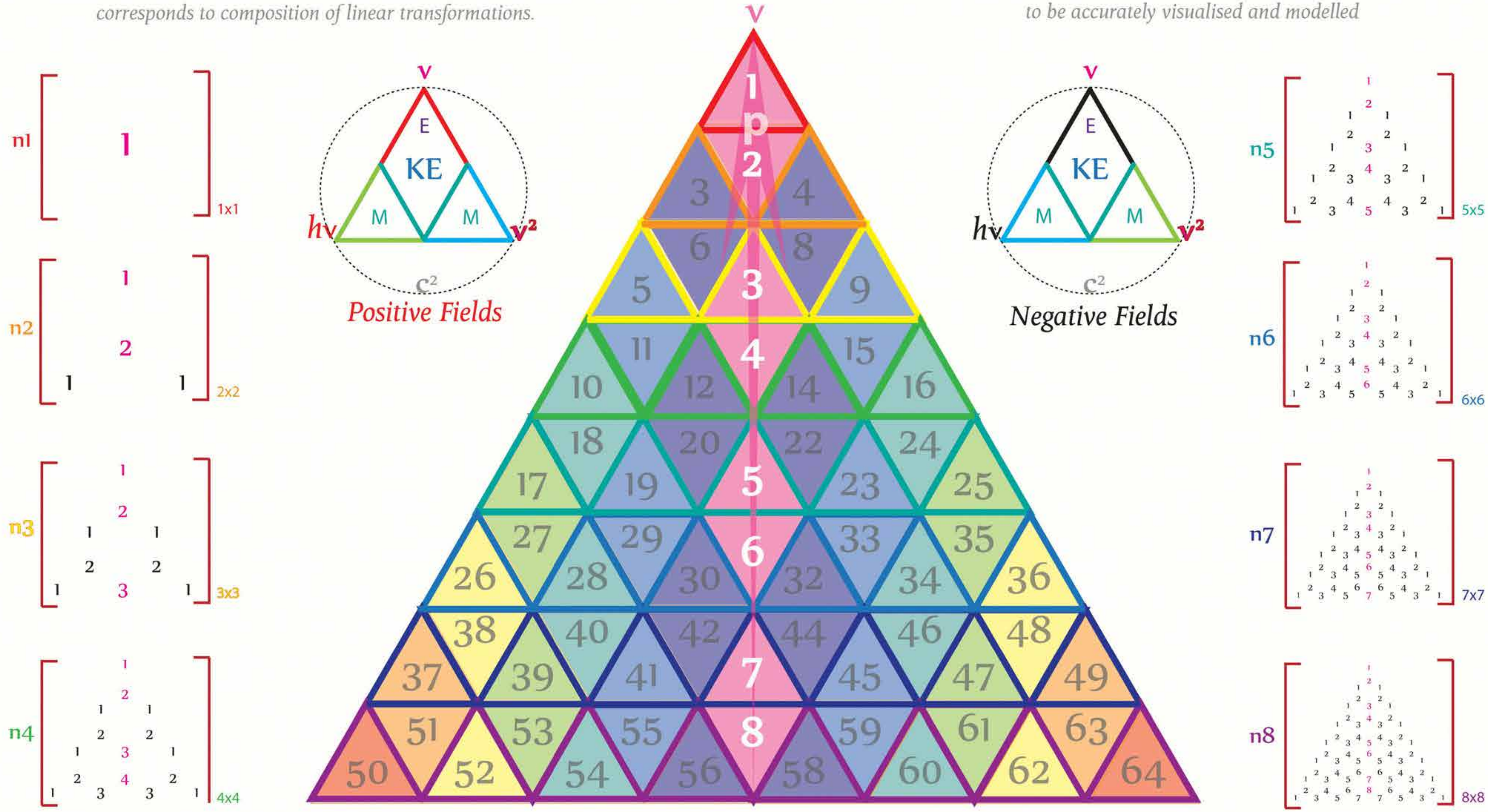


All EM geometries are comprised of Transverse quantum levels and Longitudinal wave probabilities

Matrices are a key tool in linear algebra.
One use of matrices is to represent linear transformations, which are higher-dimensional analogs of linear functions of the form f(x) = cx, where c is a constant; matrix multiplication corresponds to composition of linear transformations.

Matrices

Further developing equilateral Matrices and tensor mathematics to reflect the 2D geometry of EM , KEM and GEM quantum fields, along with the geometric quantisation of mass-energiy momenta and their energy distributions allows for field interactions to be accurately visualised and modelled

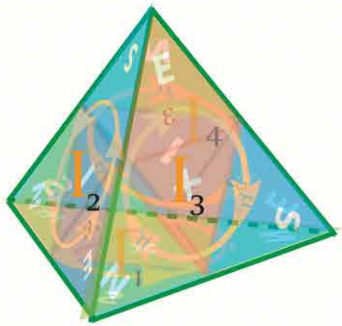


Tensors are geometric entities introduced into mathematics and physics to extend the notion of scalars, geometric vectors, and matrices to increasingly higher orders.

Modifying Square matrices to reflect the equialteral geometries of Tetryonic fields allows for the accurate geometric modelling of all Scalar & Vector fields along with their varied intrinsic quantum energies and physical properties

Energy momenta Tensors

momenta
(a property of Energy)
is converative



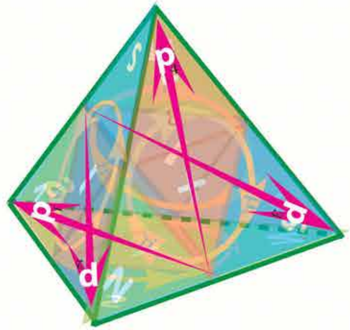
$p_M \longrightarrow (E, p1, p2, p3, p4).$

All standing-wave Matter topologies can be modelled using its Tetryonic charge energy momenta Tensors

with an additional Kinetic EM energy-momenta tensor required for Matter in motion

$p_{KEM} \longrightarrow (E, p5).$

Matter
(a geometric property)
is NOT conservative

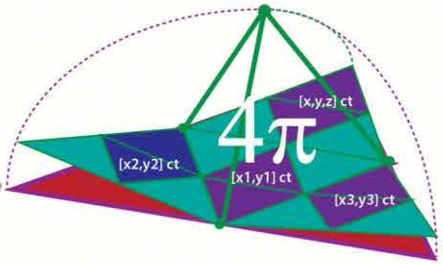


2D+1 [SR] mass-energy momenta can be folded into 3D+1 [GR] Matter that can be modelled using 4 Energy-momenta tensors

Positive standing-wave Matter

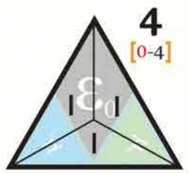
$E = \sum_{\text{all fascia}} E$

Energy of a massive particle is the total of all Planck quanta (compton frequency) in a 3D geometry



$\vec{p} = \sum_{\text{all fascia}} \vec{p}$

Total Momentum is the total of all quanta linear Momenta in a 3D particle



Negative standing-wave Matter

Relativistic Matter in motion

$I = \sum_{\text{all fascia}} I$

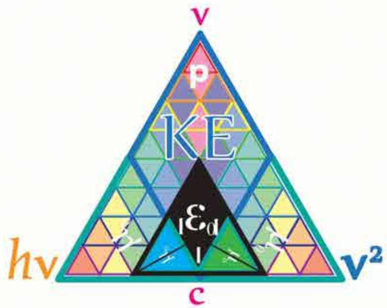
Inertial mass is the total of all inertia in a 3D particle

Photons have null energy-momentum tensors

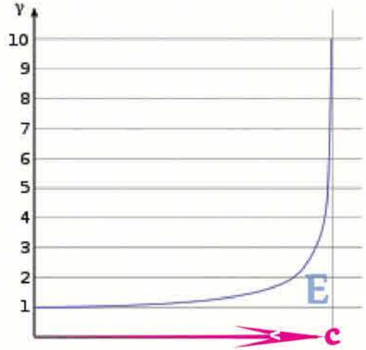
Note that both 2D mass-energies [Special Relativity] and 3D Matter [General Relativity] have distinct Energy momenta

It is the 3D Tetrahedral topologies that provides a definative basis for Matter

Relativistic Matter in motion



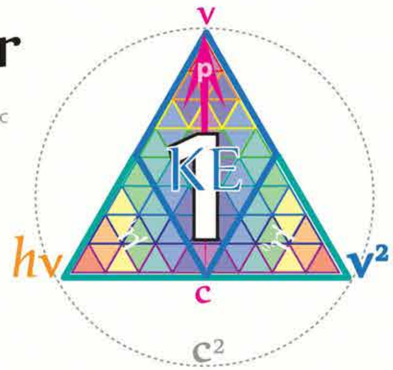
Tetryonic Energy momenta tensors should not be confused with Four vector tensors which map energy-momenta vectors in 3D spatial[cartesian] co-ordinate systems

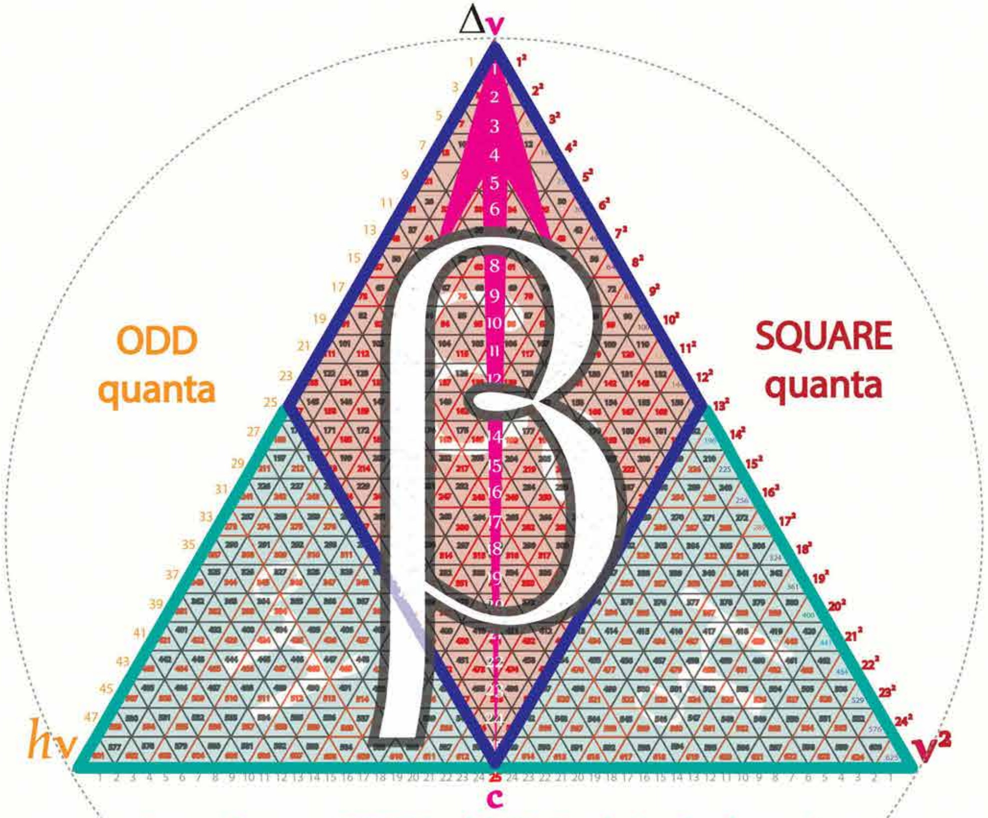


Relativistic Lorentz correction factor

The Lorentz factor or Lorentz term is an expression which appears in several equations in special relativity
It is often incorrectly graphed [as pictured to the right] as an increasing function of velocity approaching but never reaching c

'c' is the maximum velocity acheivable through the electrical acceleration of particles is NOT the maximum velocity possible for Matter in motion





Linear correction factor

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

Scalar correction factor

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

Lorentz factors are LINEAR and SCALAR velocity related corrections to the relativistic mass-energy momenta content of any physical system accelerated by EM Forces

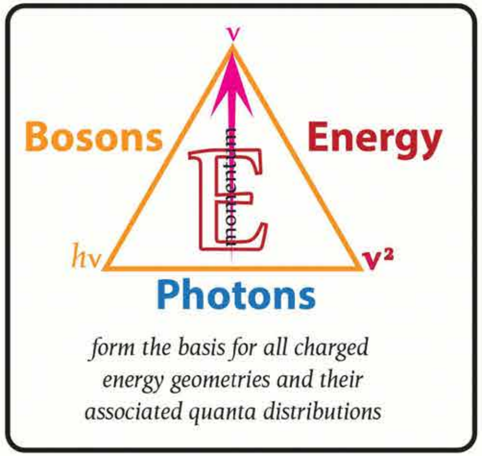
$\frac{\Delta\gamma}{c^2}$ Wavelength contraction

Time Dilation $\frac{\Delta\Omega}{c^2}$

$\frac{\Delta mv}{c^2}$ Relativistic momentum

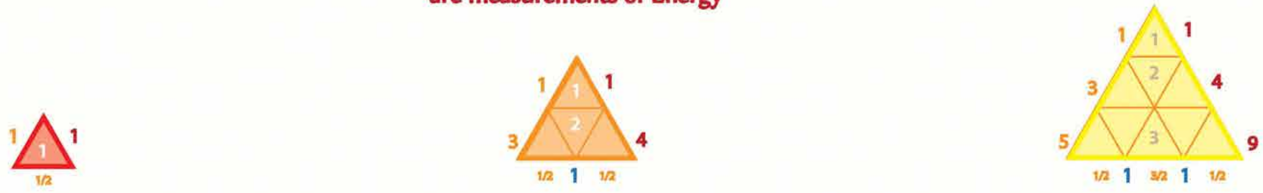
$\frac{\Gamma}{c^2}$ Lorentz corrections

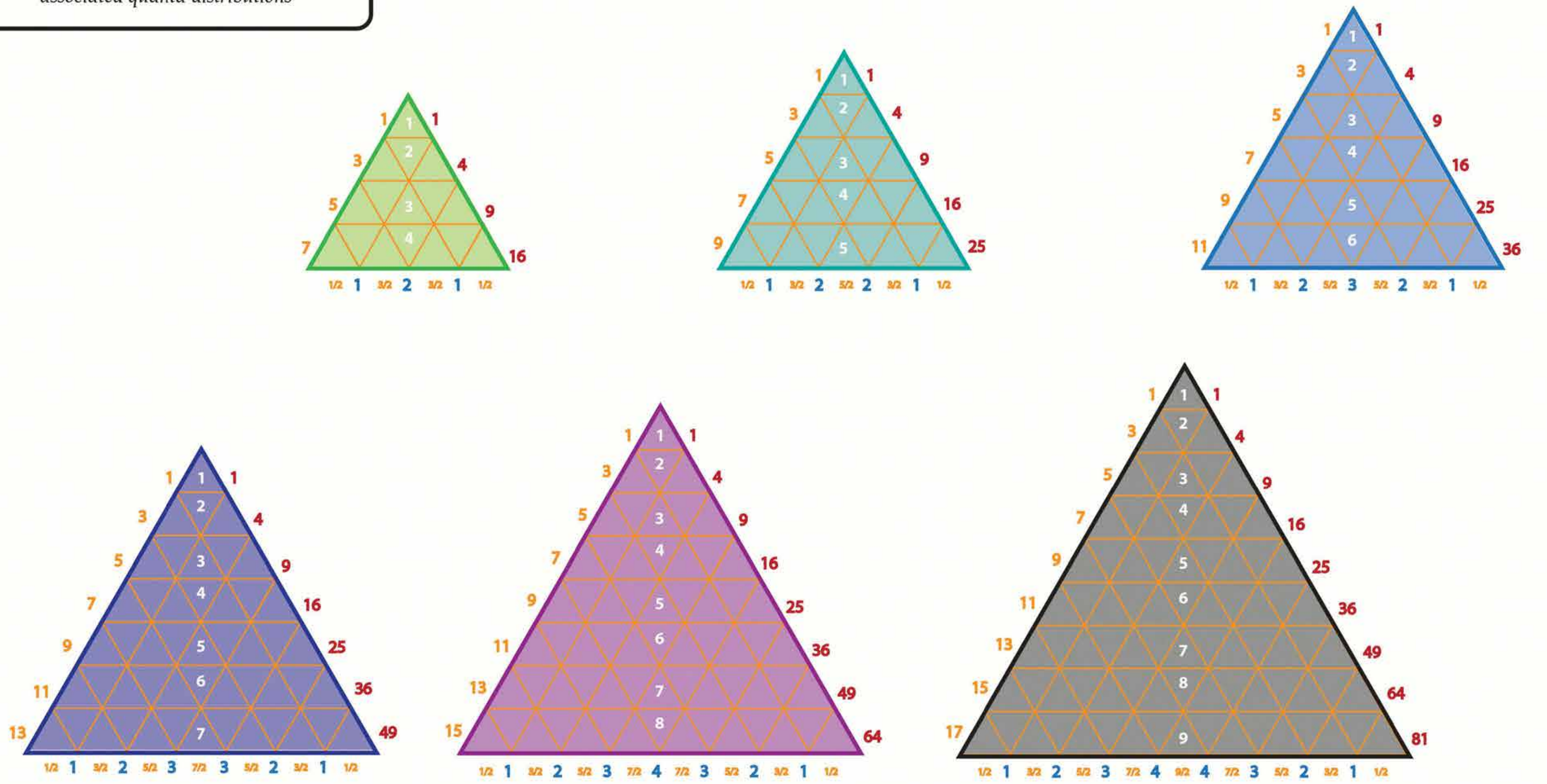
Relativistic mass-energy $\frac{\Delta hv}{c^2}$



Equilateral energies

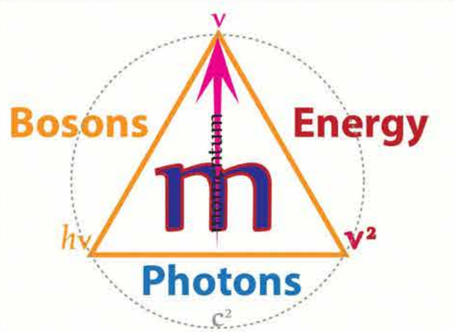
Any measurements of mass without a Space-Time co-ordinate system are measurements of Energy



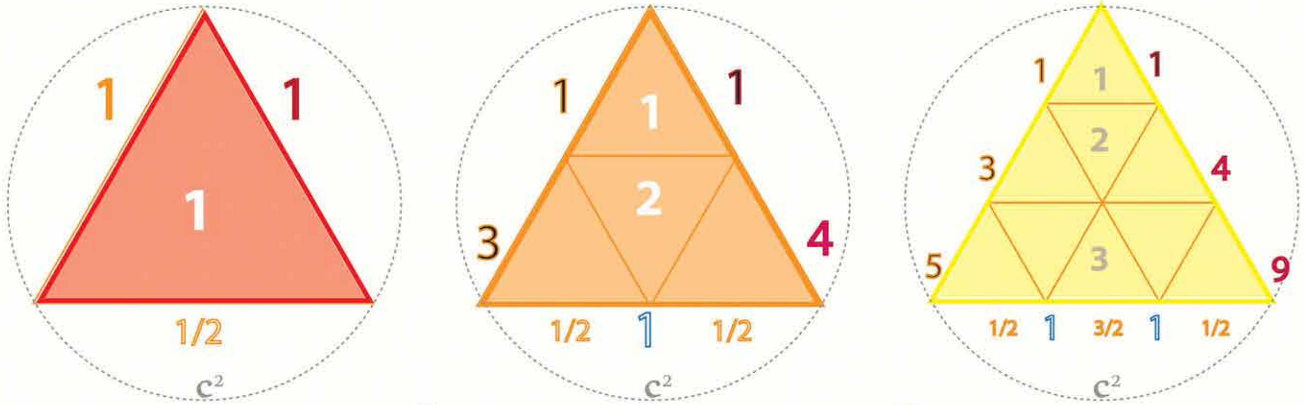


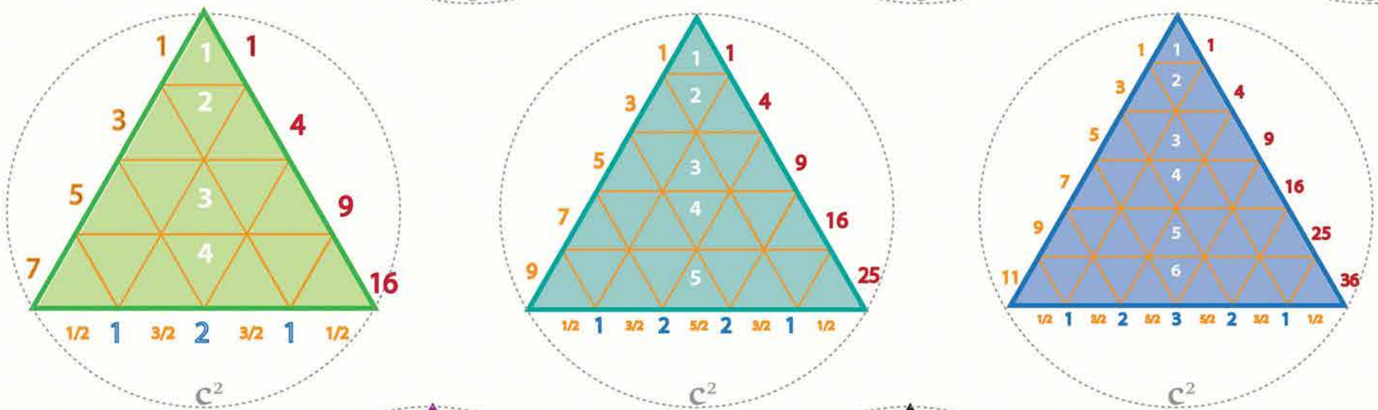
Electromagnetic mass

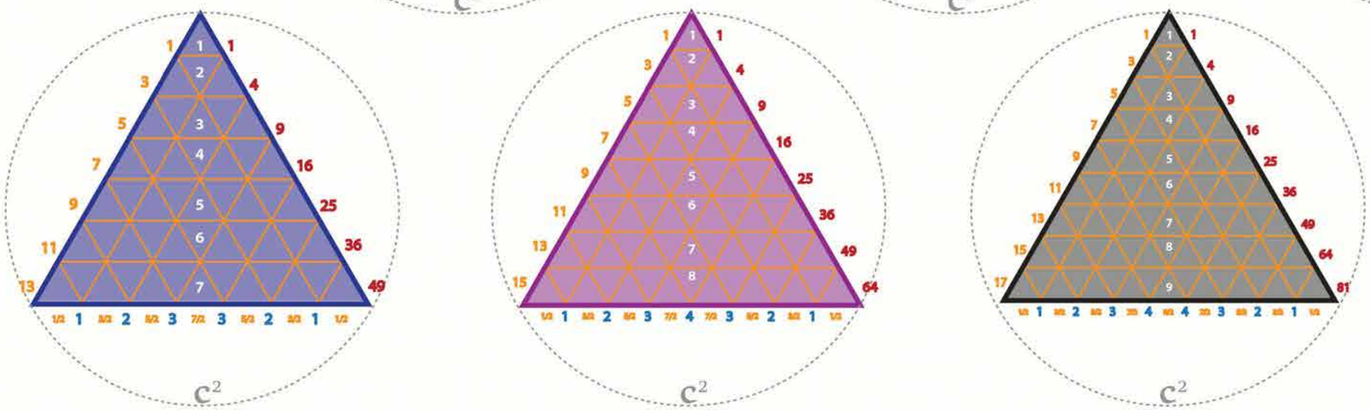
2D mass-energy is the surface integral of 3D Matter



Time specific measurements of equilateral ENERGY momenta geometries forms the basis for EM mass







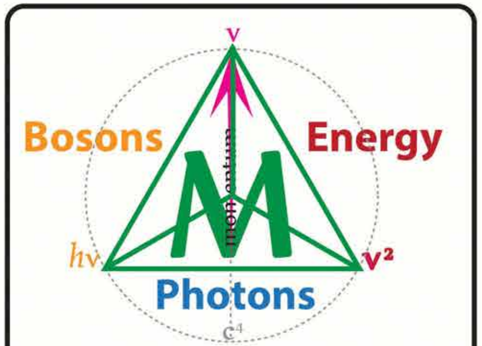
mass-less particles is a physical misnomer

All measurements of energy in spatial co-ordinate systems are measurements of mass

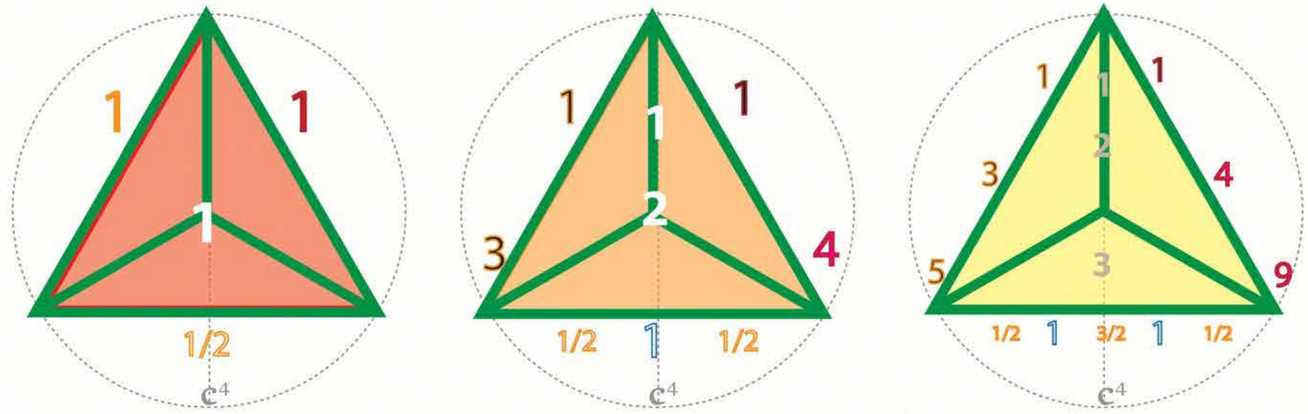
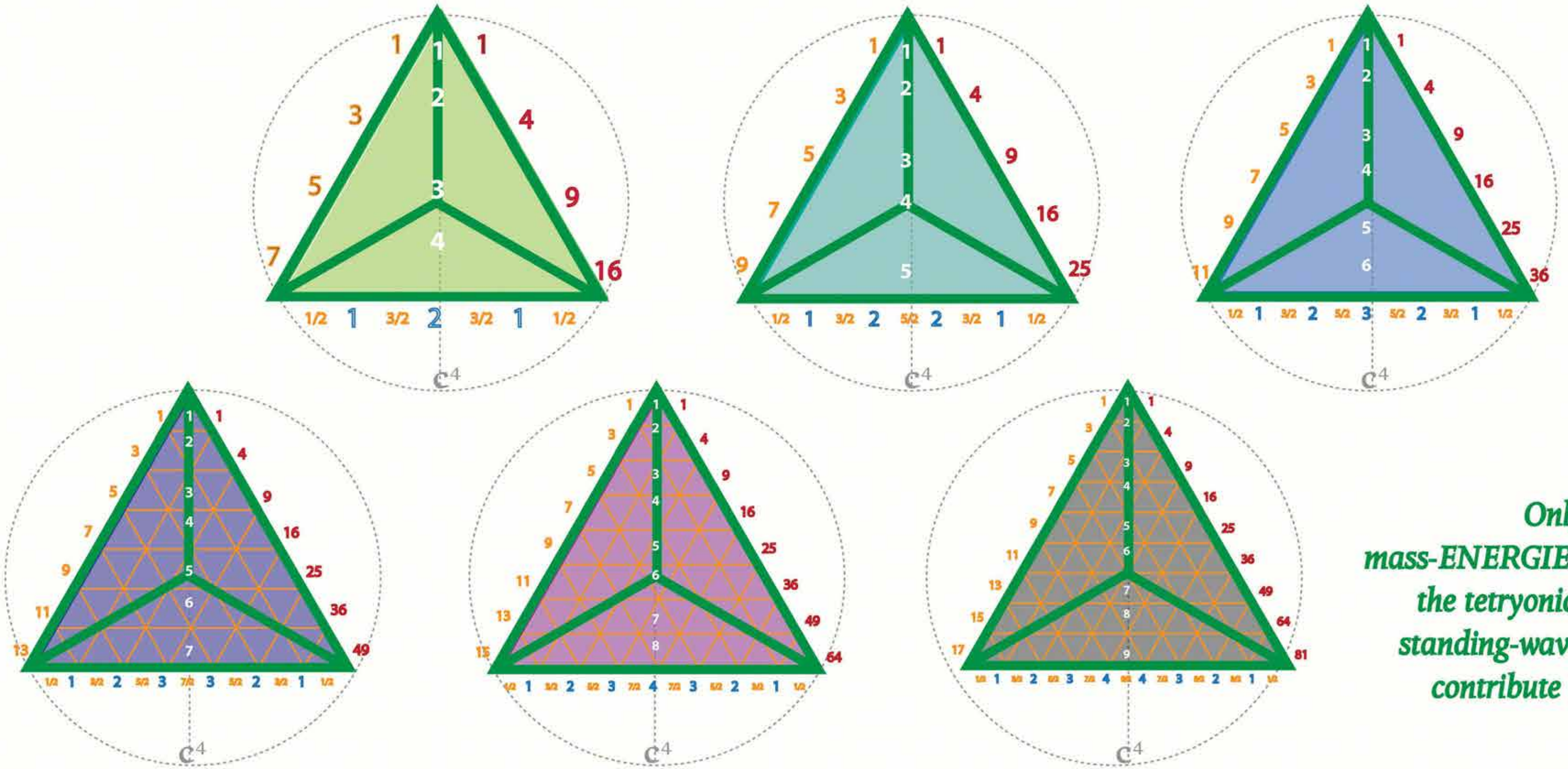
Matter-less is the appropriate terminology

Standing-wave Matter

Matter is a higher order 3D topology created by standing wave mass-energies

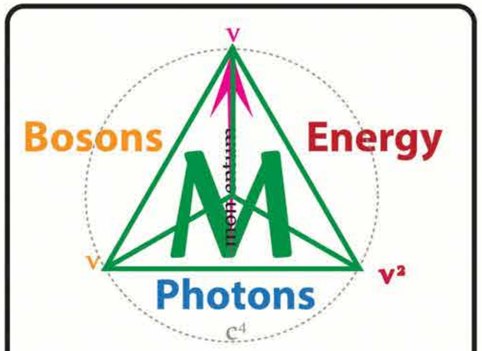


The equilateral mass-ENERGY content of 4nπ Tetrahedral standing-wave topologies forms the basis of Matter

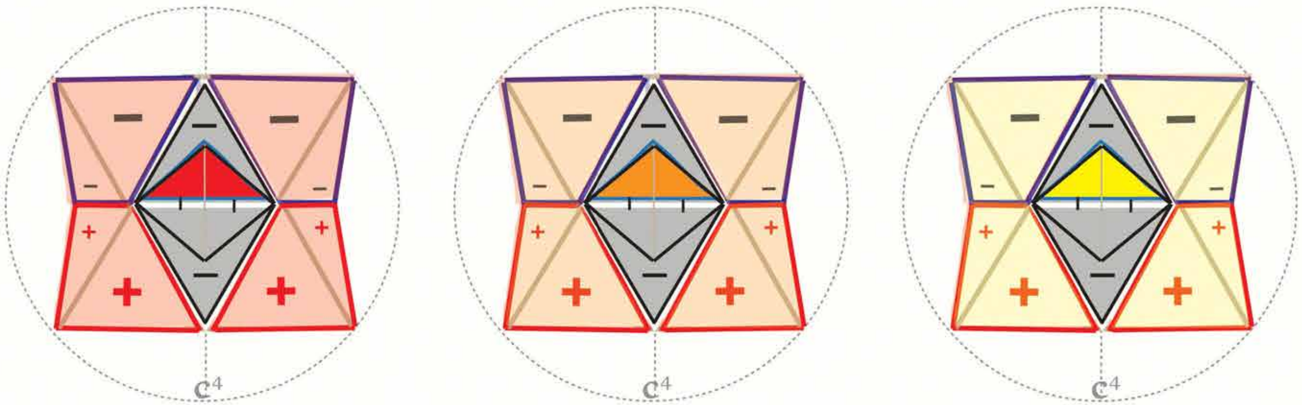



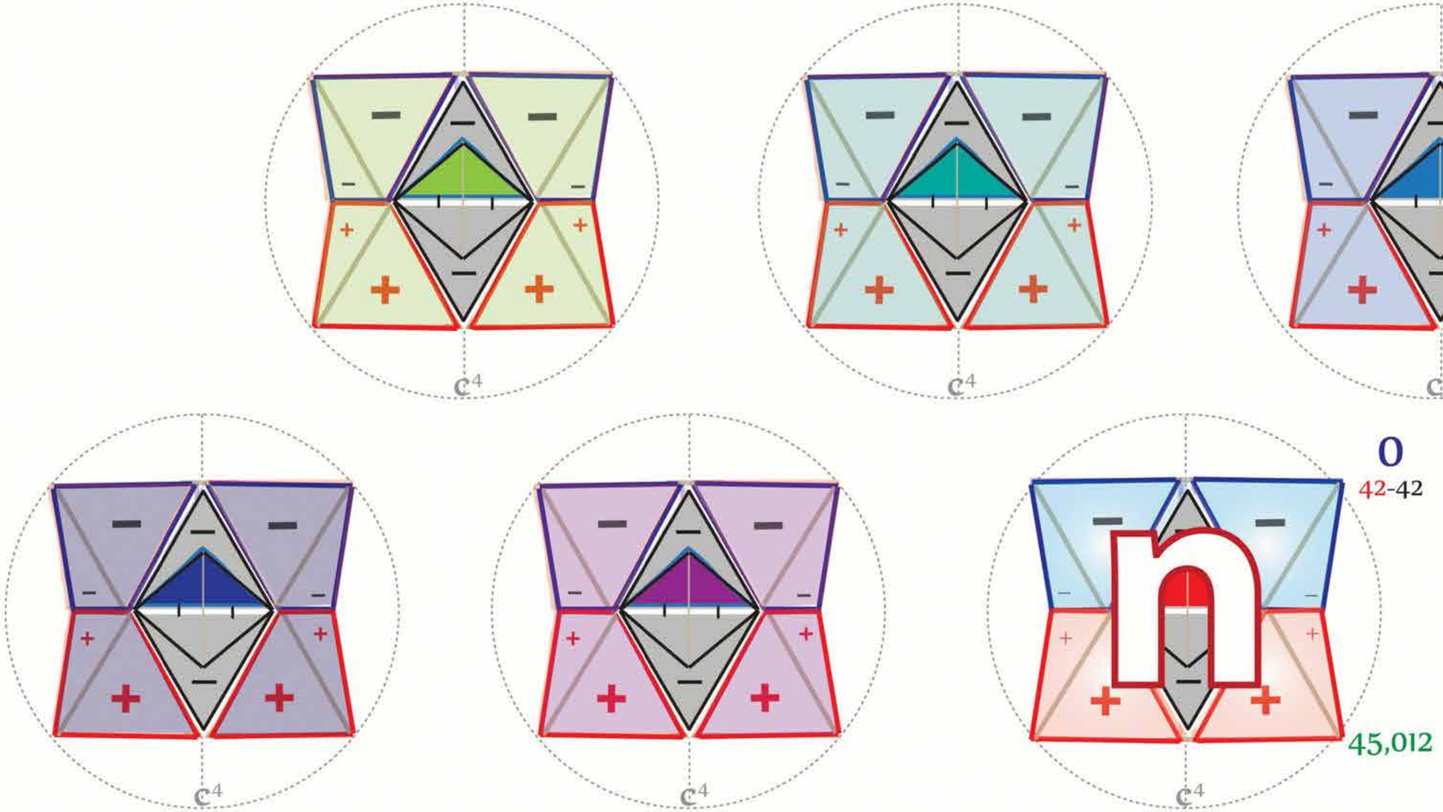
Only mass-ENERGIES contained in the tetryonic fascia of standing-wave topologies contribute to weight

Periodic element nuclei

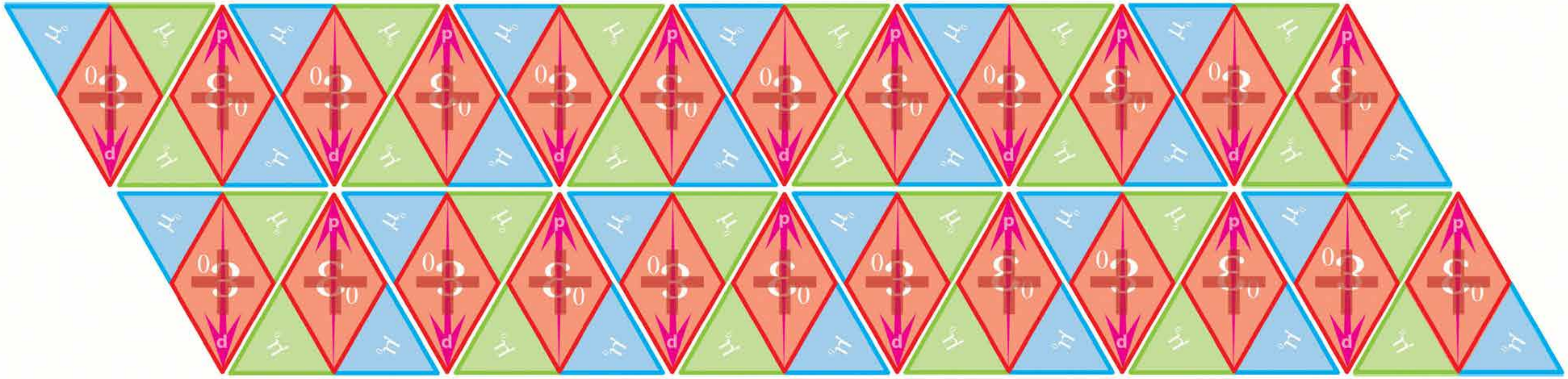


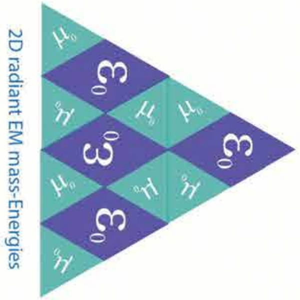
The mass-ENERGY content of
4nπ Tetrahedral standing-wave topologies
forms the basis of all periodic elements



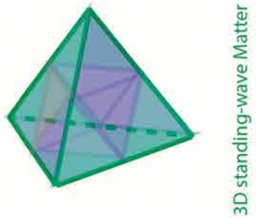


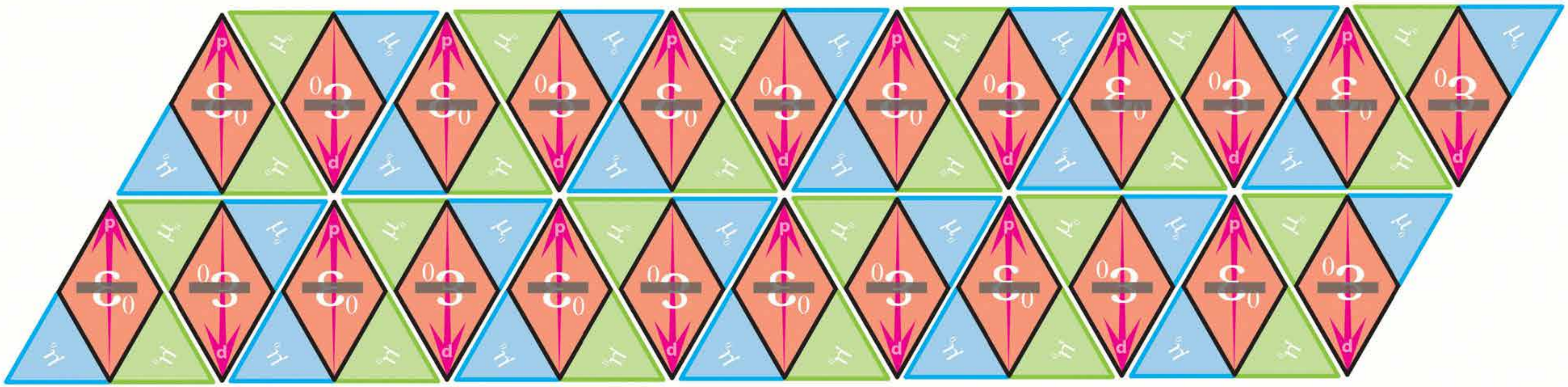
ALL periodic elements are comprised of n level deuterium nuclei

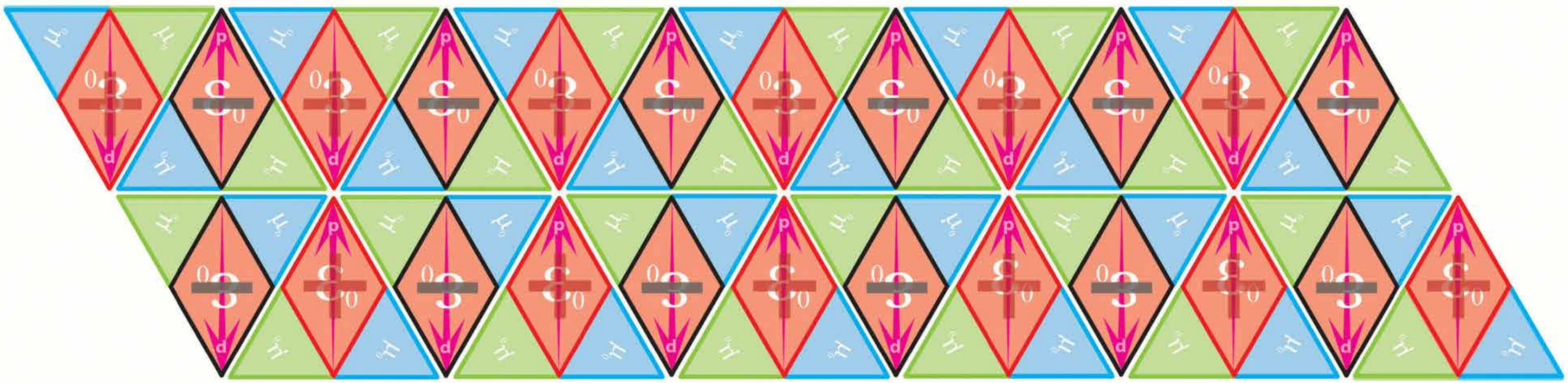


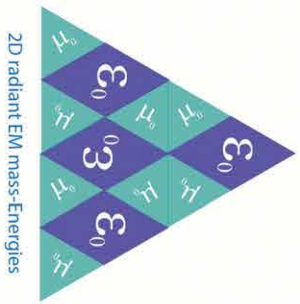


n1 - Charged Tetryon Templates

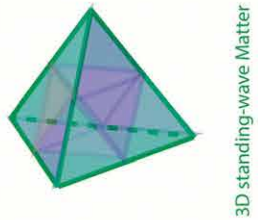


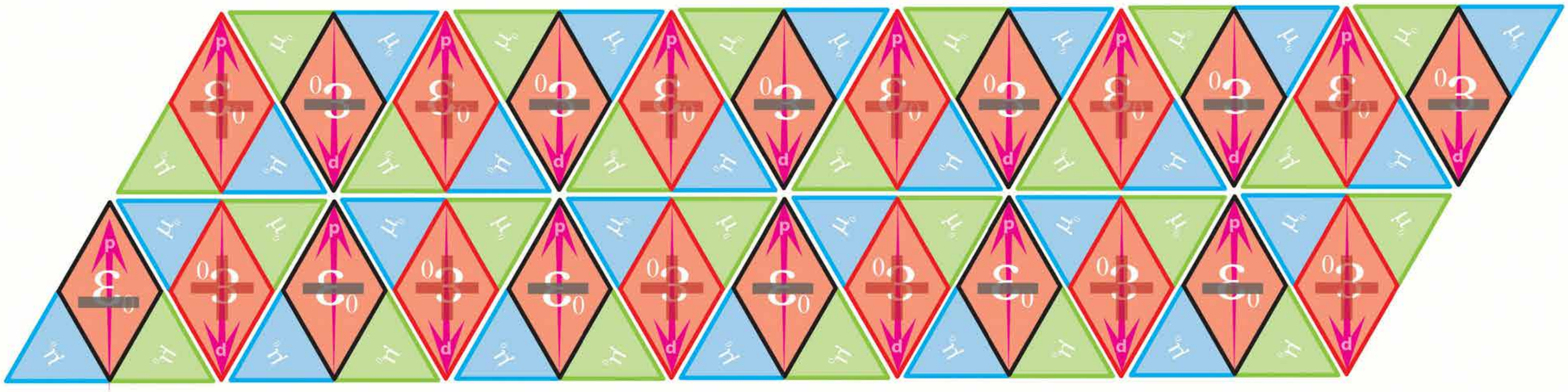


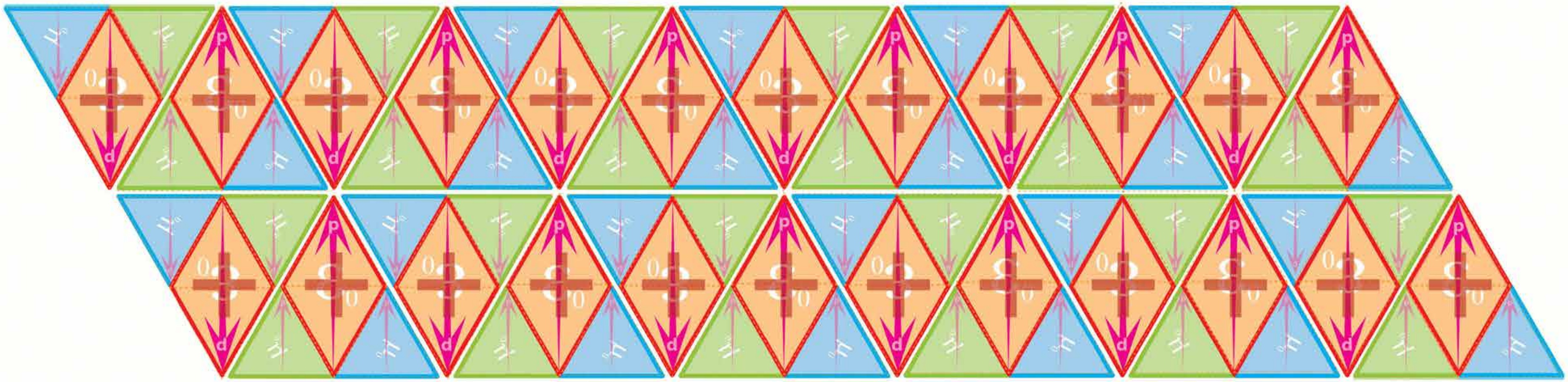


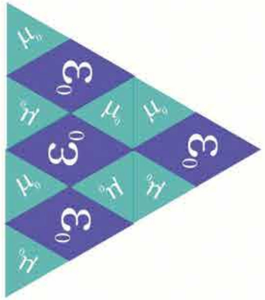


n1 - Neutral Tetryon Templates



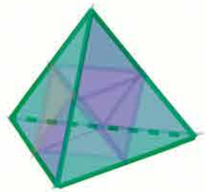




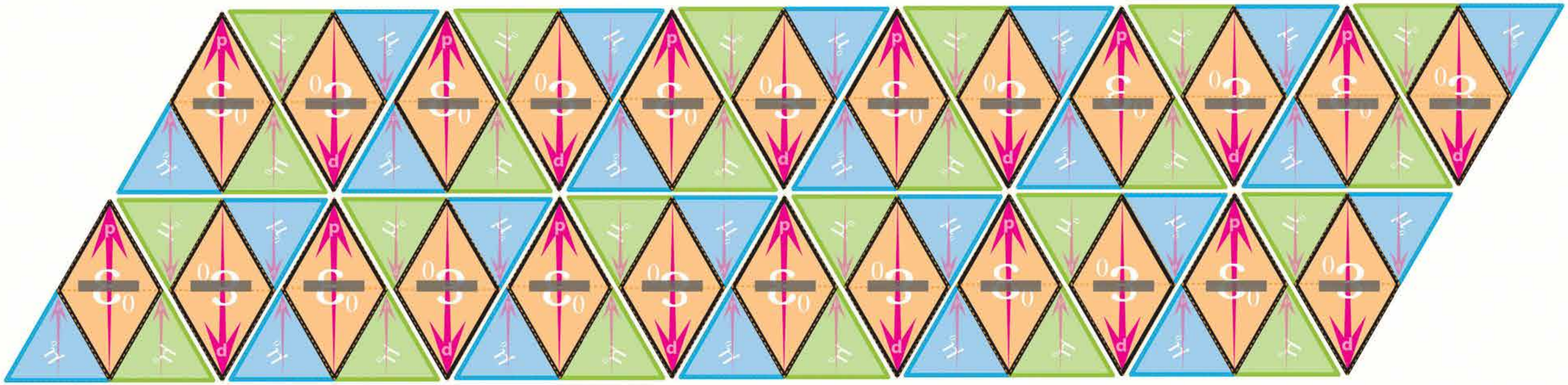


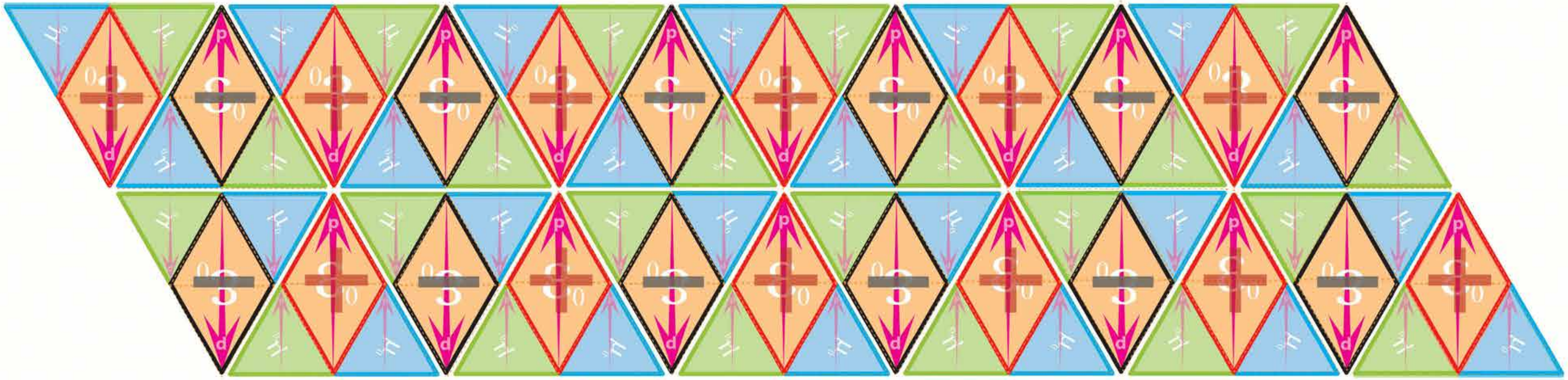
2D radiant EM mass-Energies

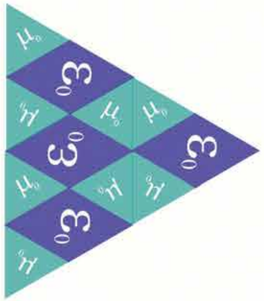
n2 - Charged Tetryon Templates



3D standing-wave Matter

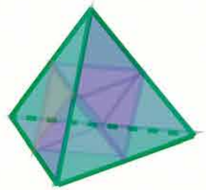




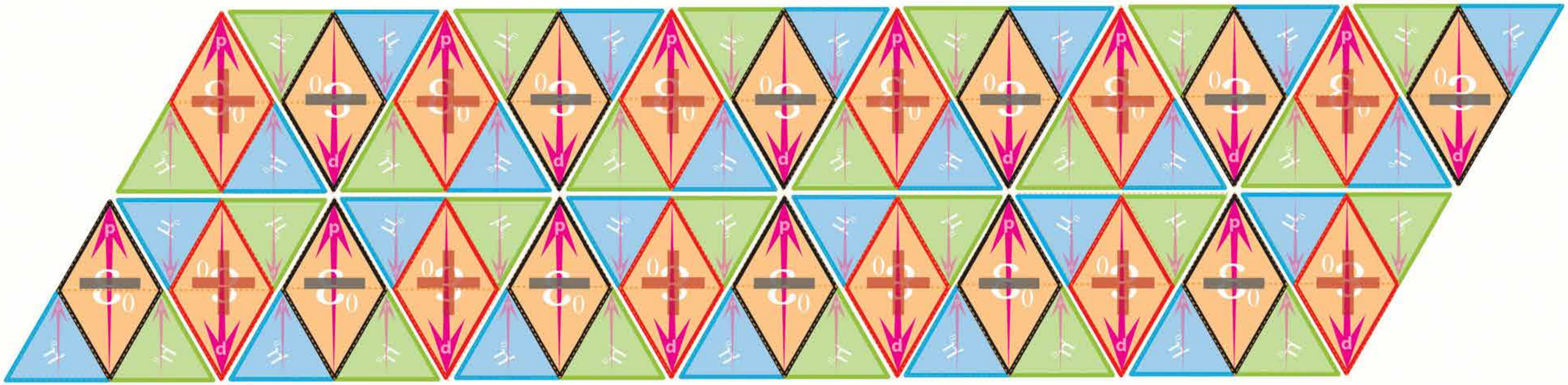


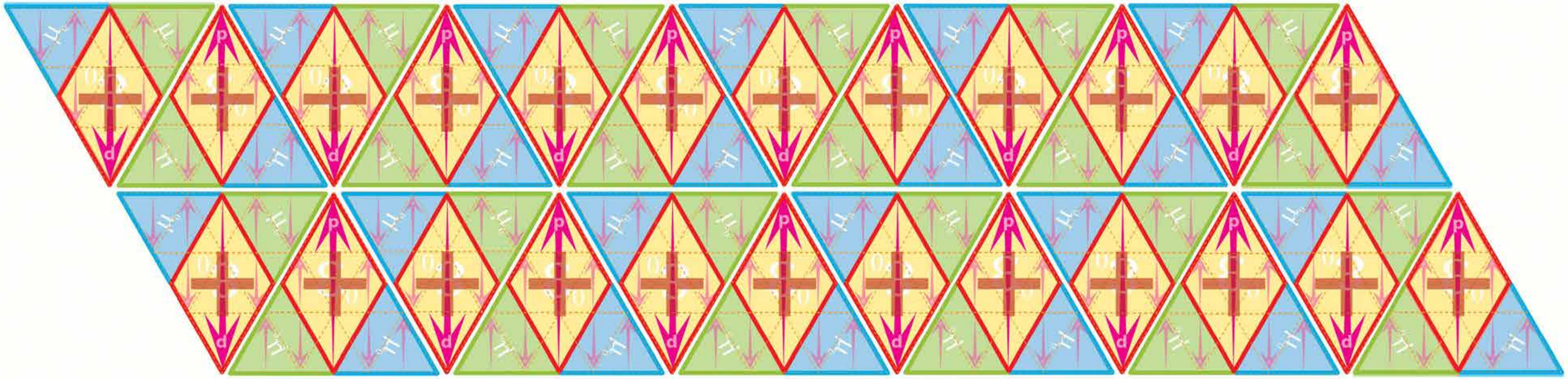
2D radiant EM mass-Energies

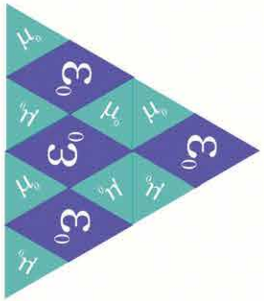
n2 - Neutral Tetryon Templates



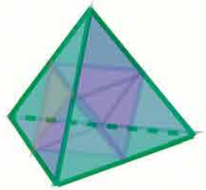
3D standing-wave Matter

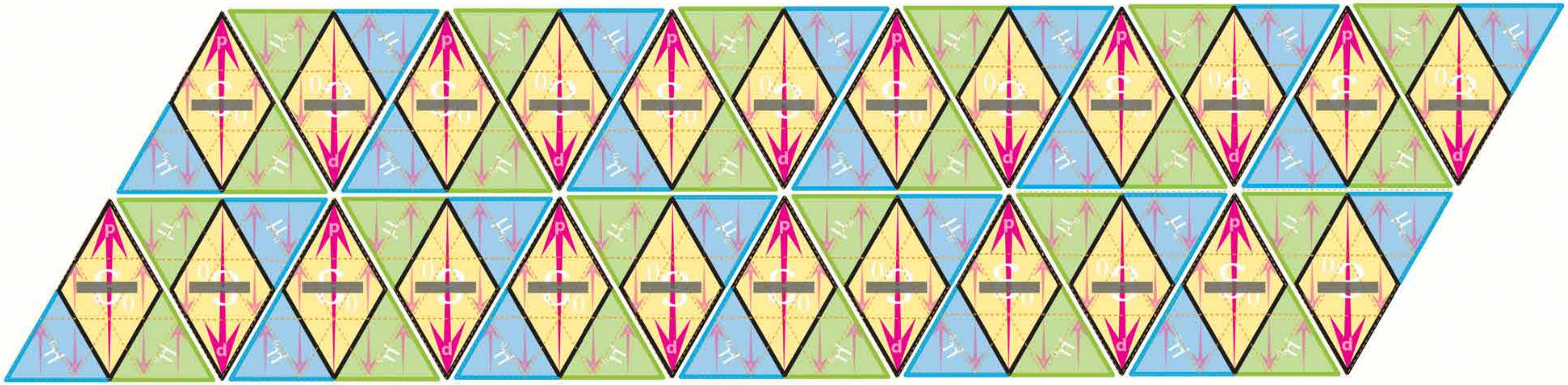


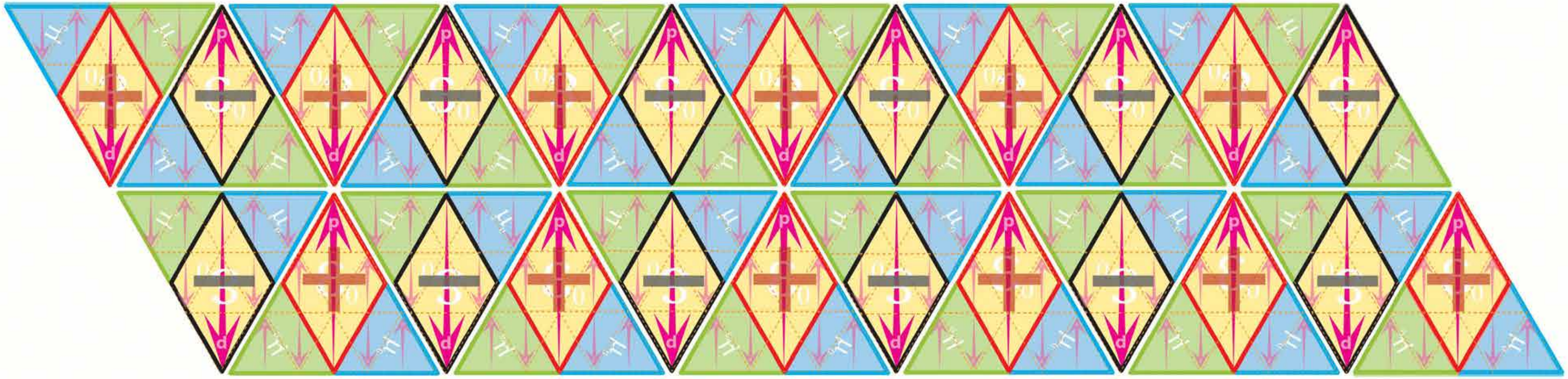




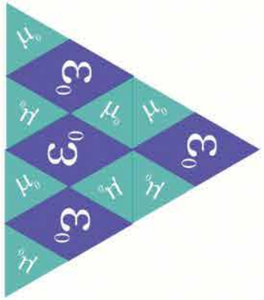
n3 - Charged Tetryon Templates



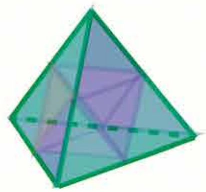




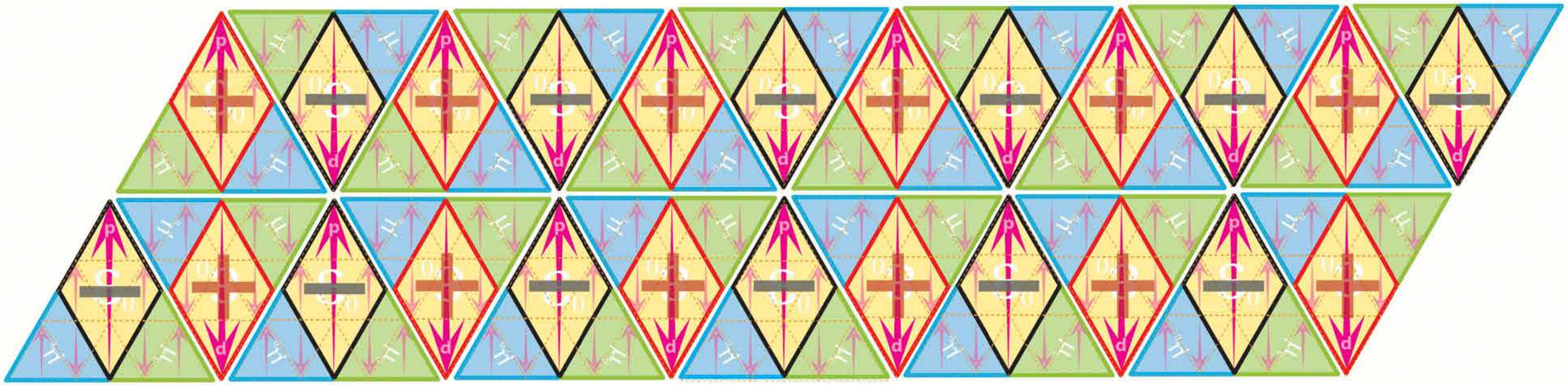
2D radiant EM mass-Energies

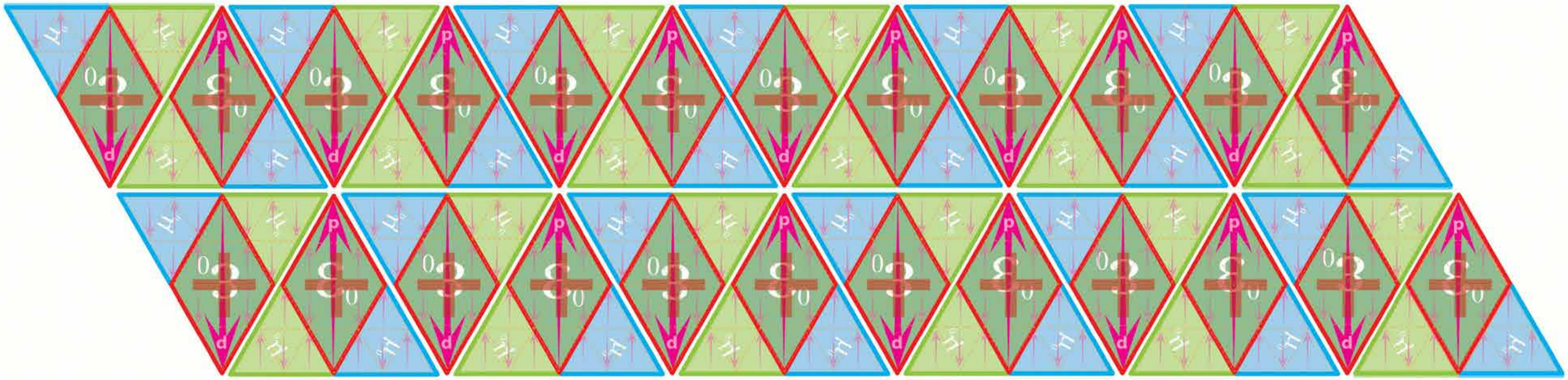


n3 - Neutral Tetryon Templates

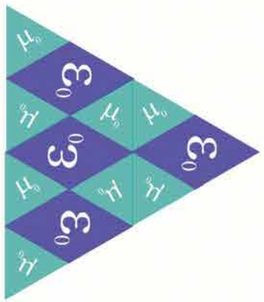


3D standing-wave Matter

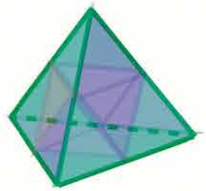




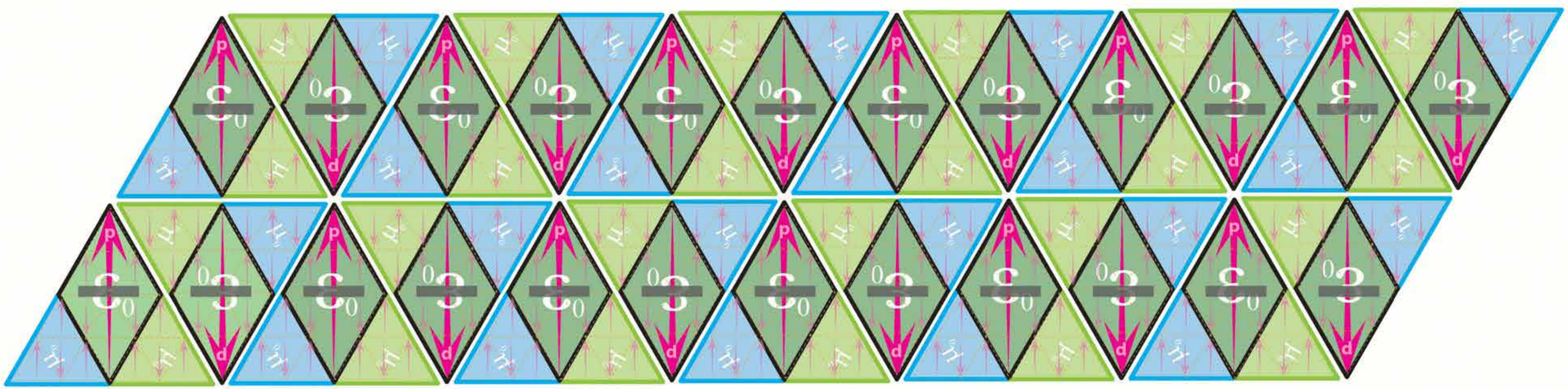
2D radiant EM mass-Energies

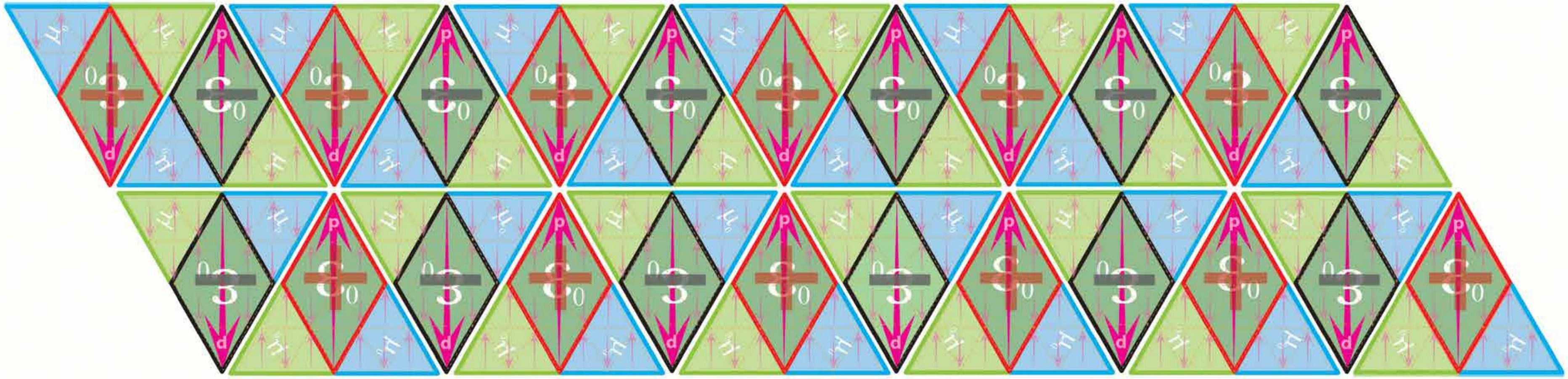


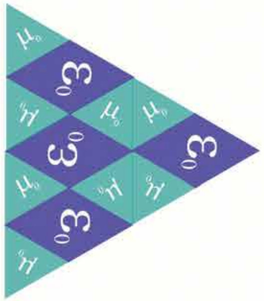
n4 - Charged Tetryon Templates



3D standing-wave Matter

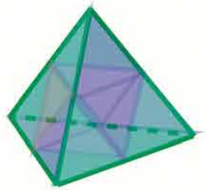




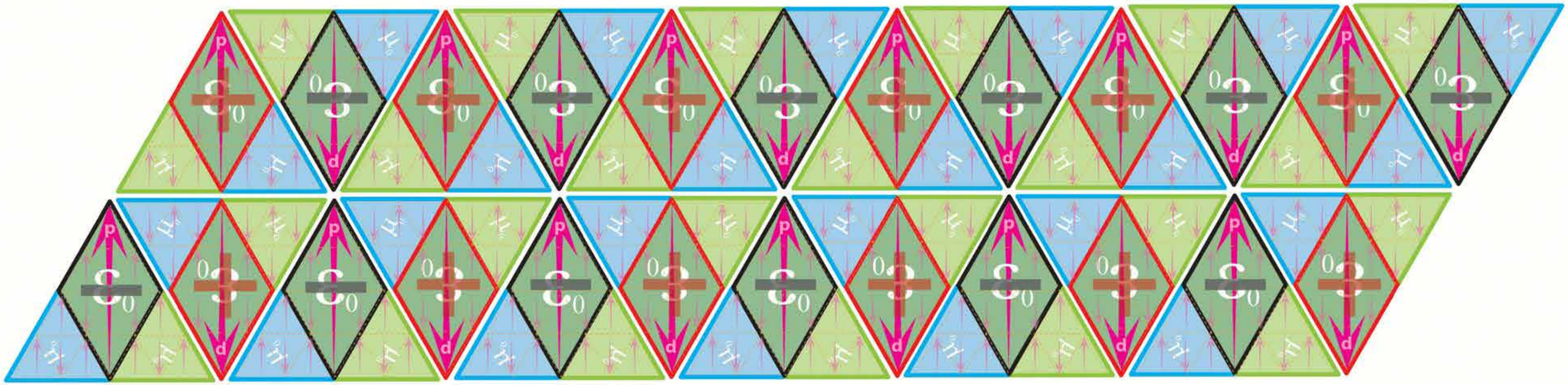


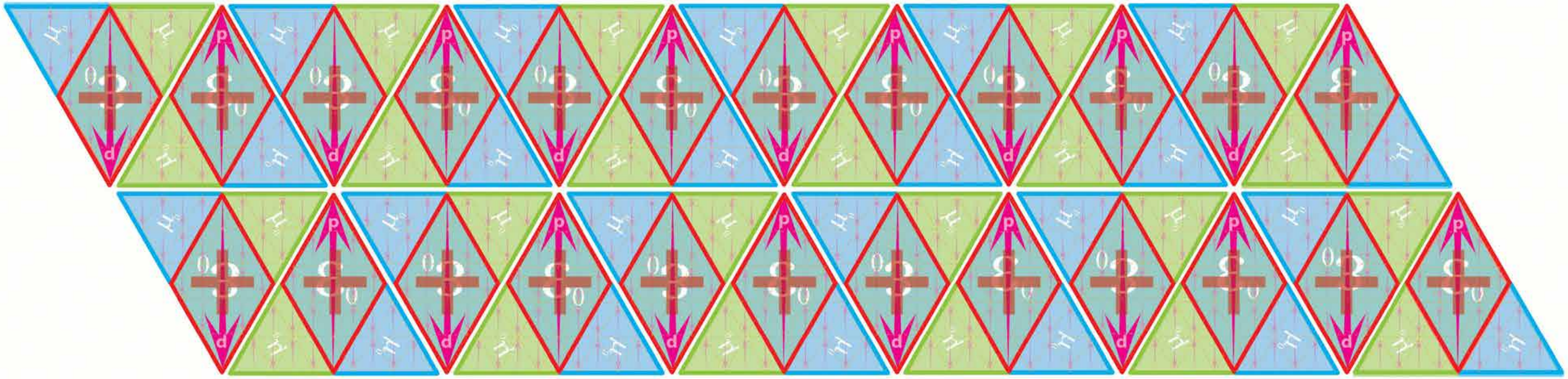
2D radiant EM mass-Energies

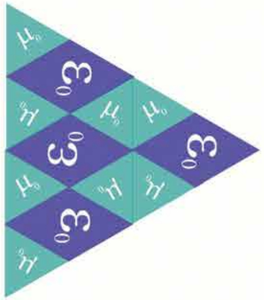
n4 - Neutral Tetryon Templates



3D standing-wave Matter

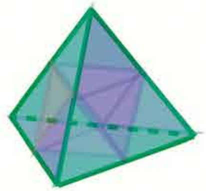




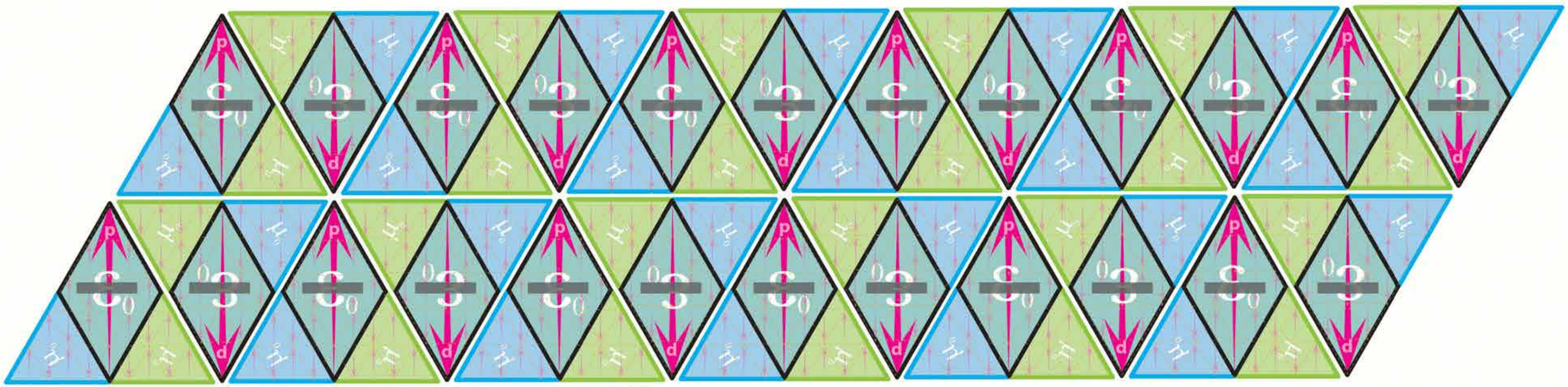


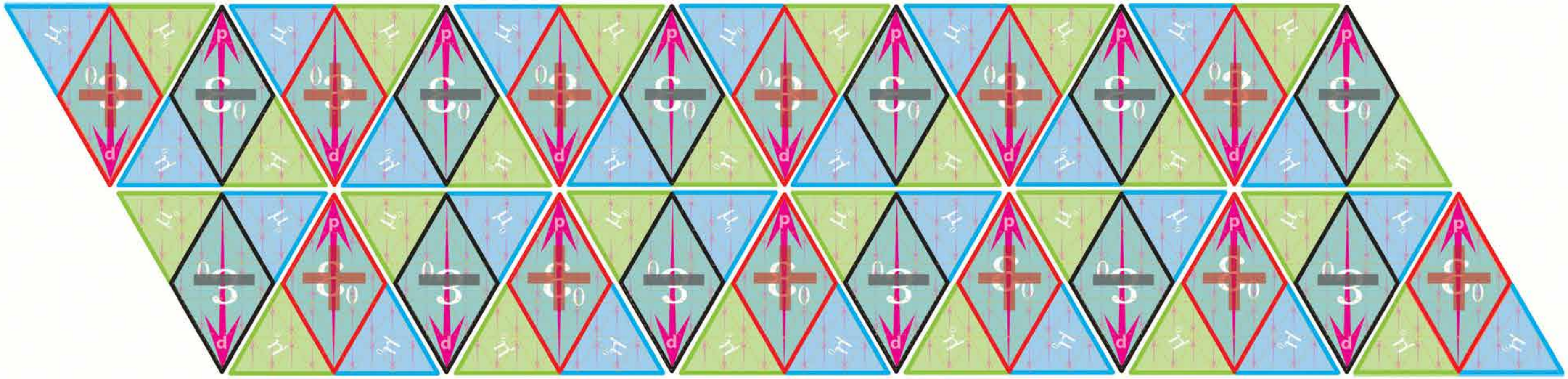
2D radiant EM mass-Energies

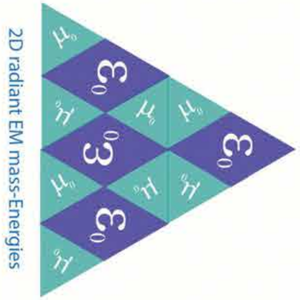
n5 - Charged Tetryon Templates



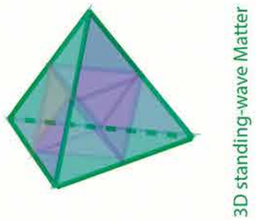
3D standing-wave Matter

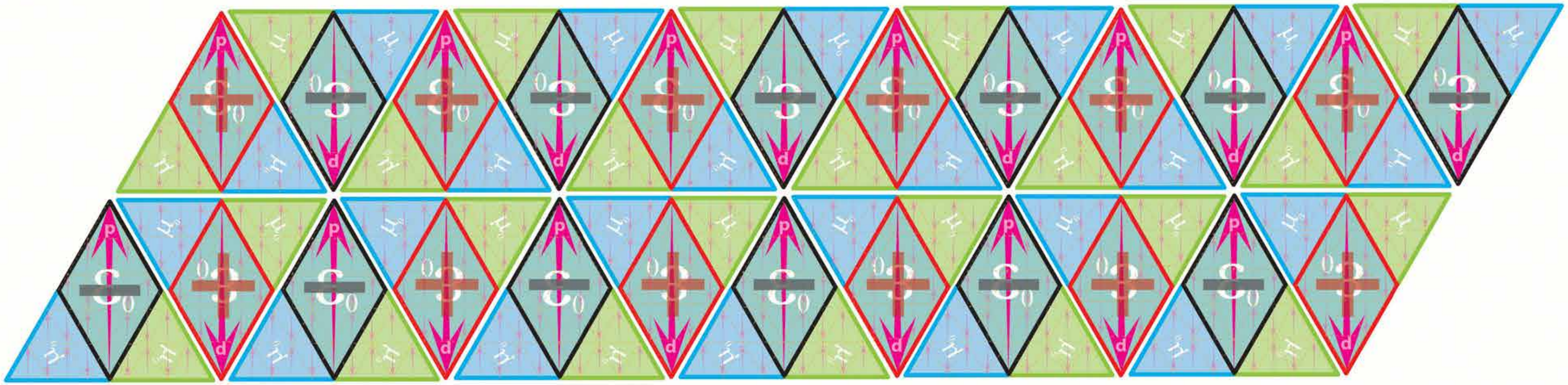


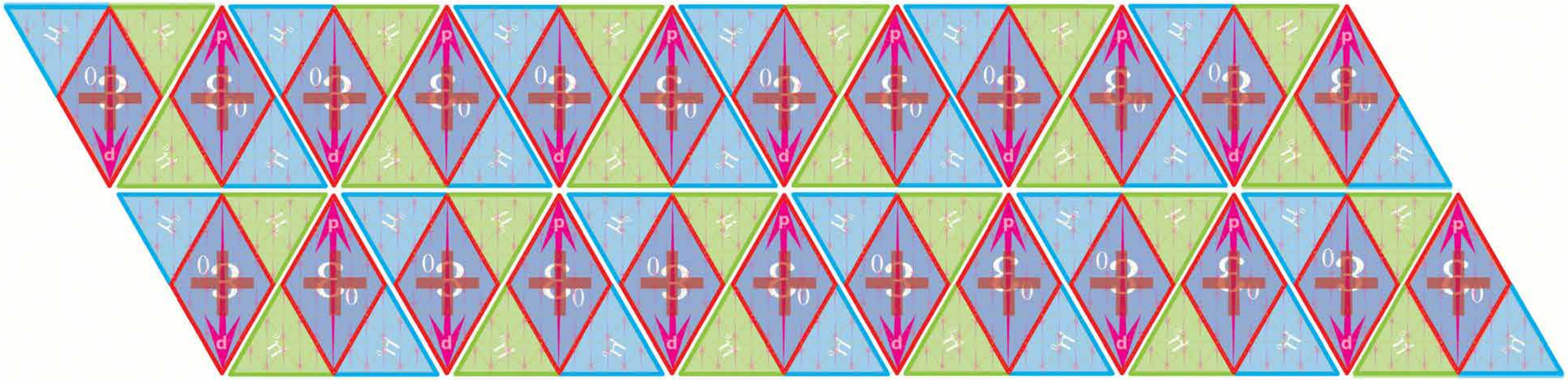




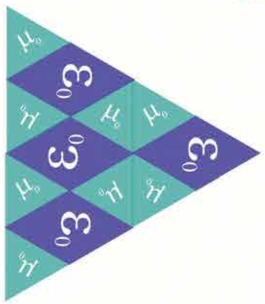
n5 - Neutral Tetryon Templates



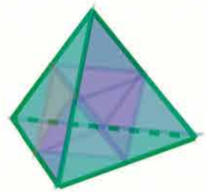




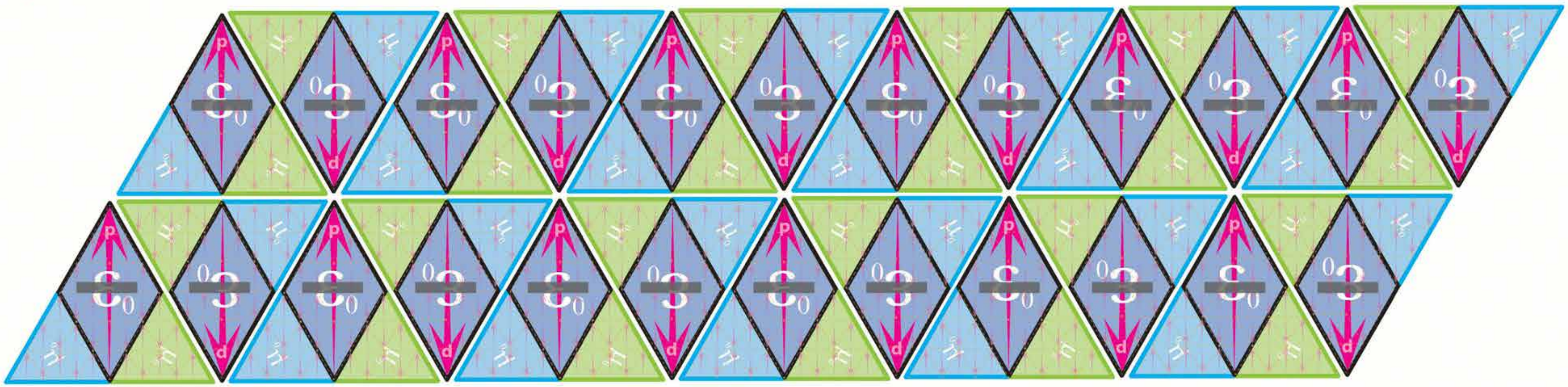
2D radiant EM mass-Energies

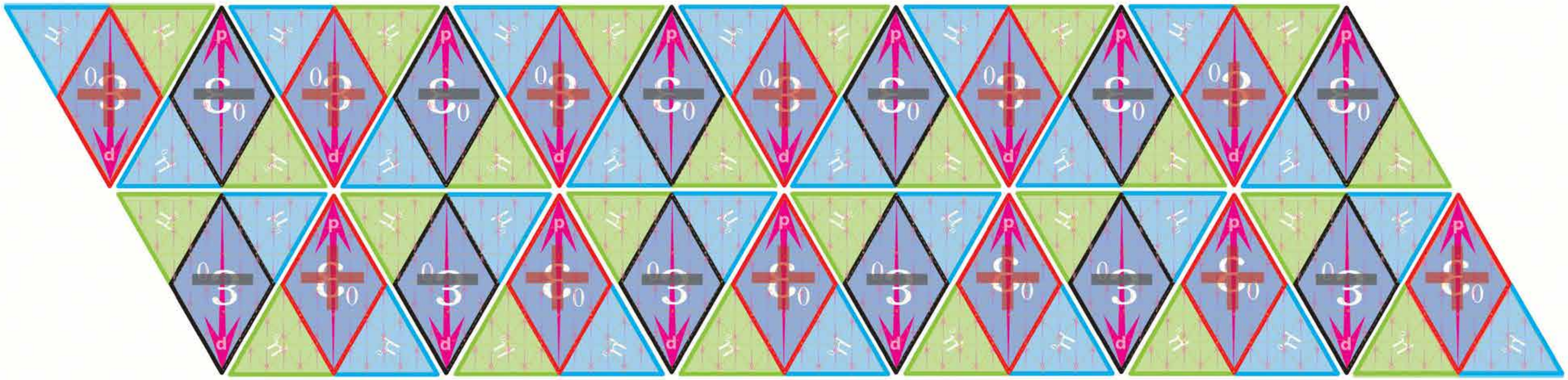


n6 - Charged Tetryon Templates

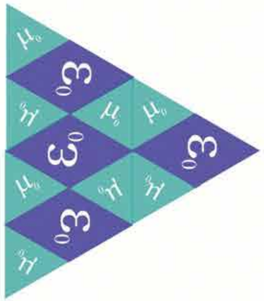


3D standing-wave Matter

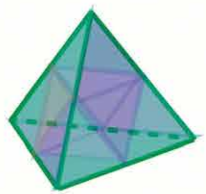




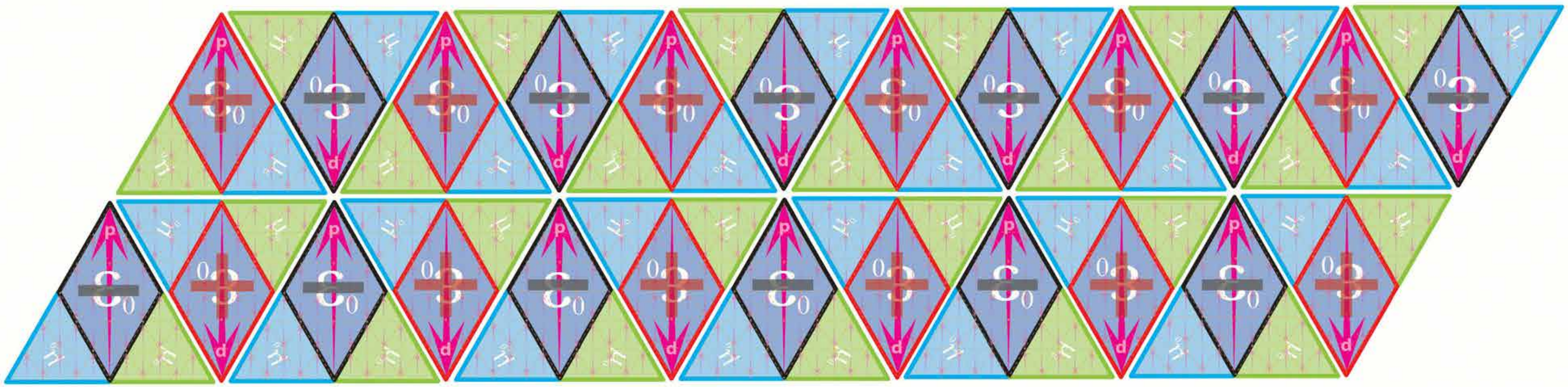
2D radiant EM mass-Energies

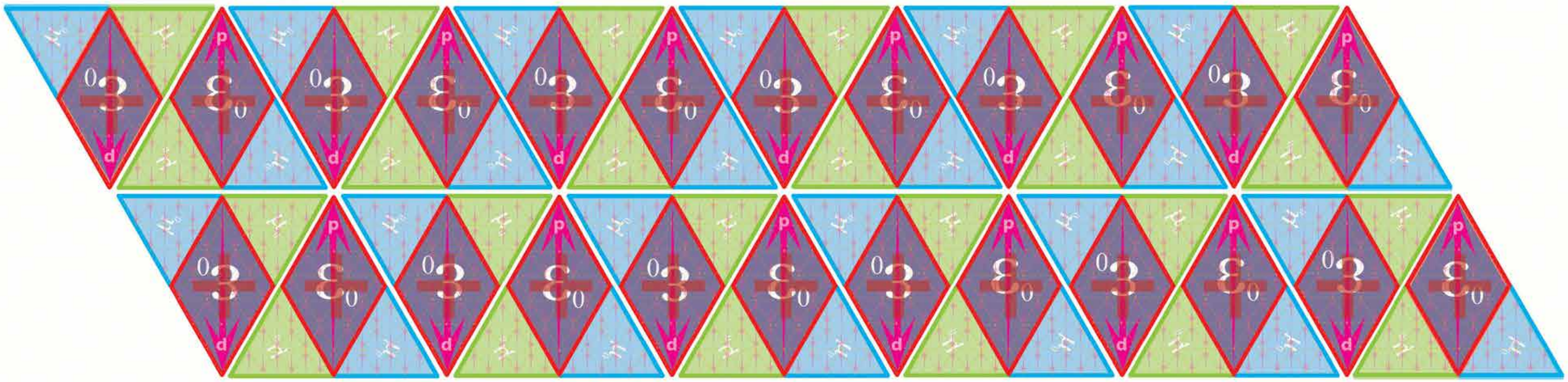


n6 - Neutral Tetryon Templates

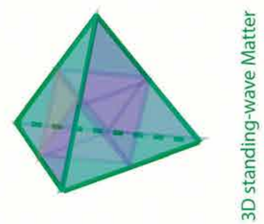


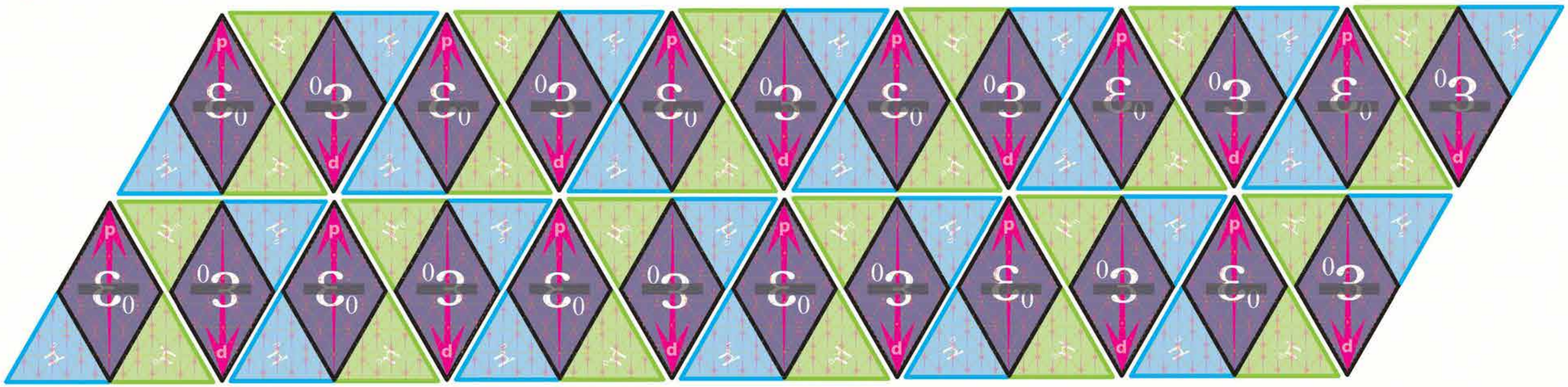
3D standing-wave Matter

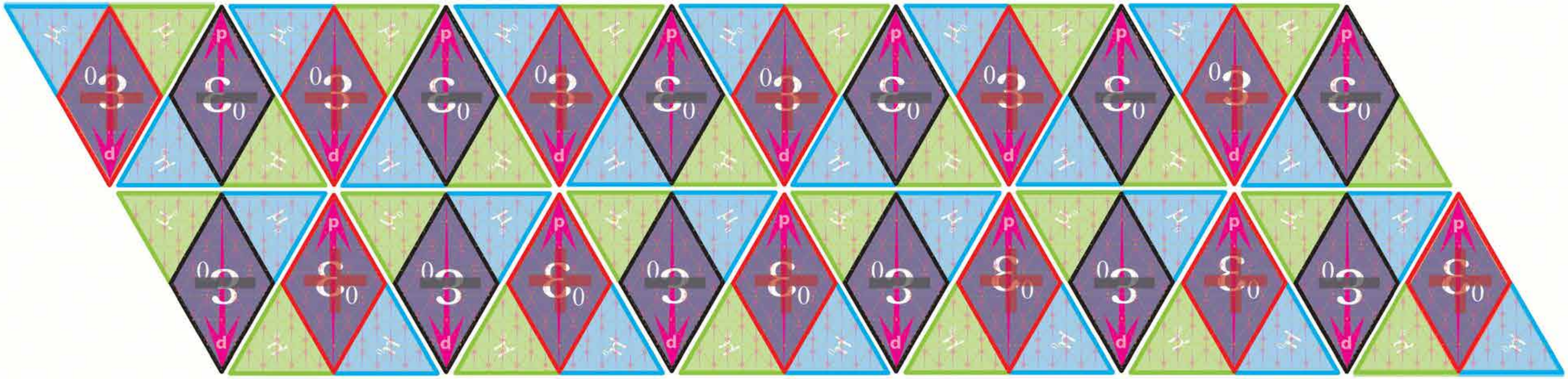




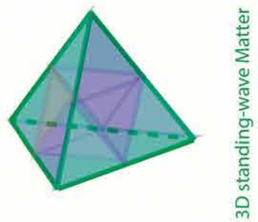
n7 - Charged Tetryon Templates

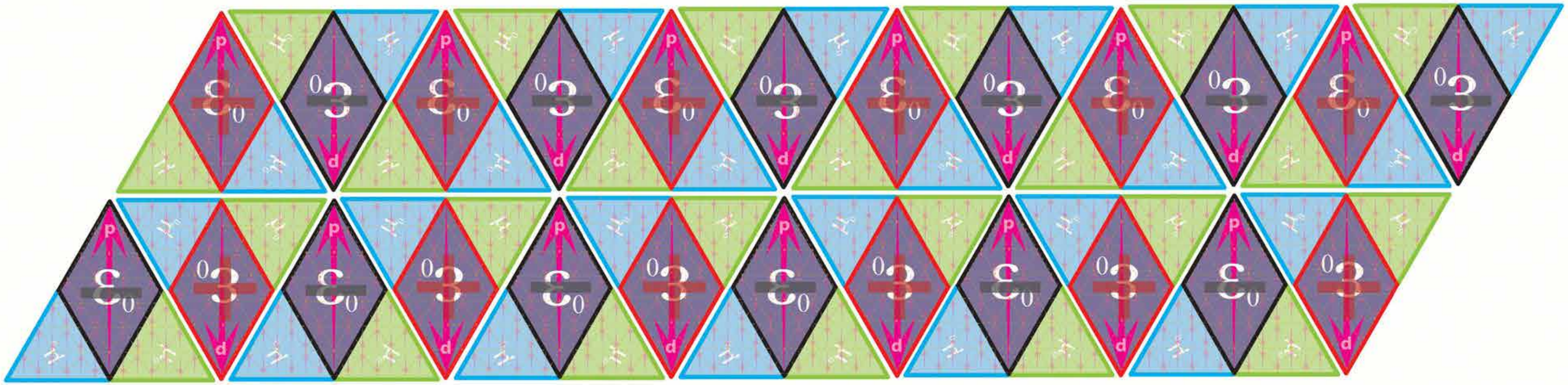


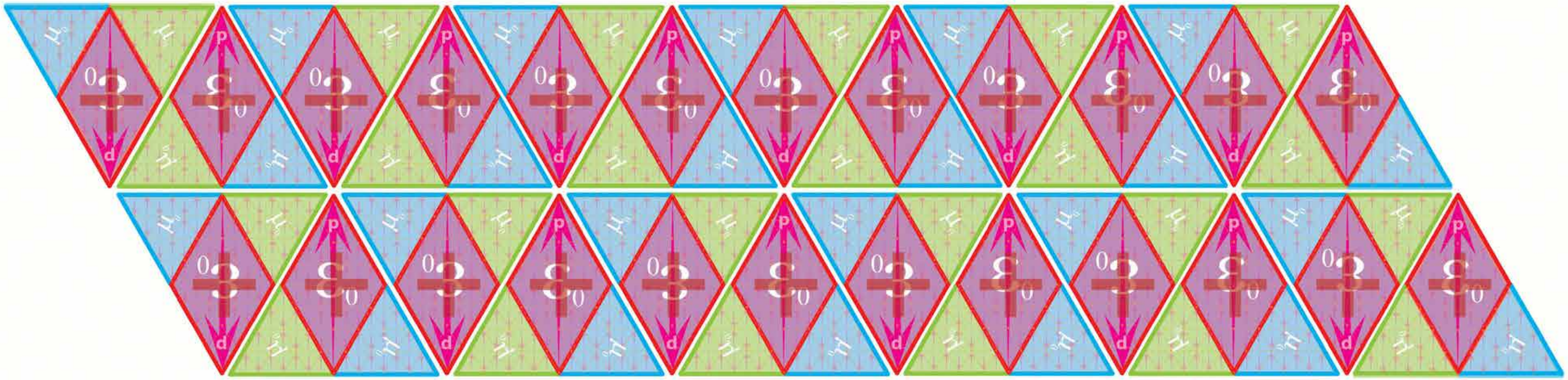


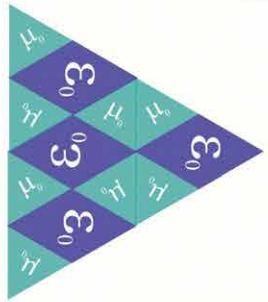


n7 - Neutral Tetryon Templates



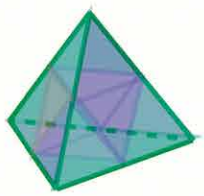




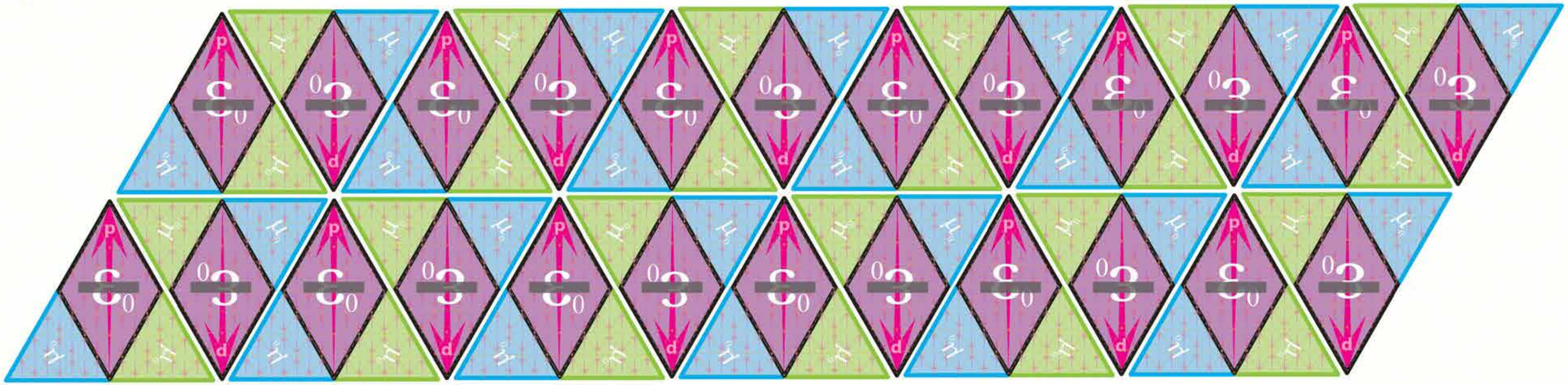


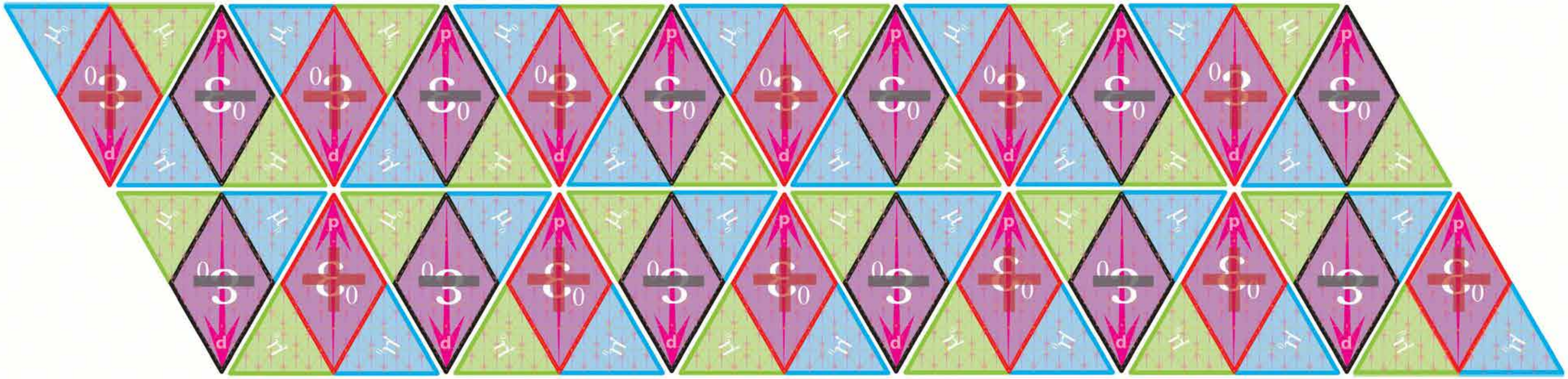
2D radiant EM mass-Energies

n8 - Charged Tetryon Templates

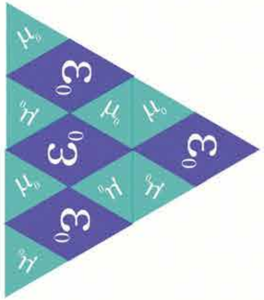


3D standing-wave Matter

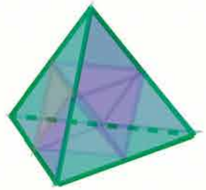




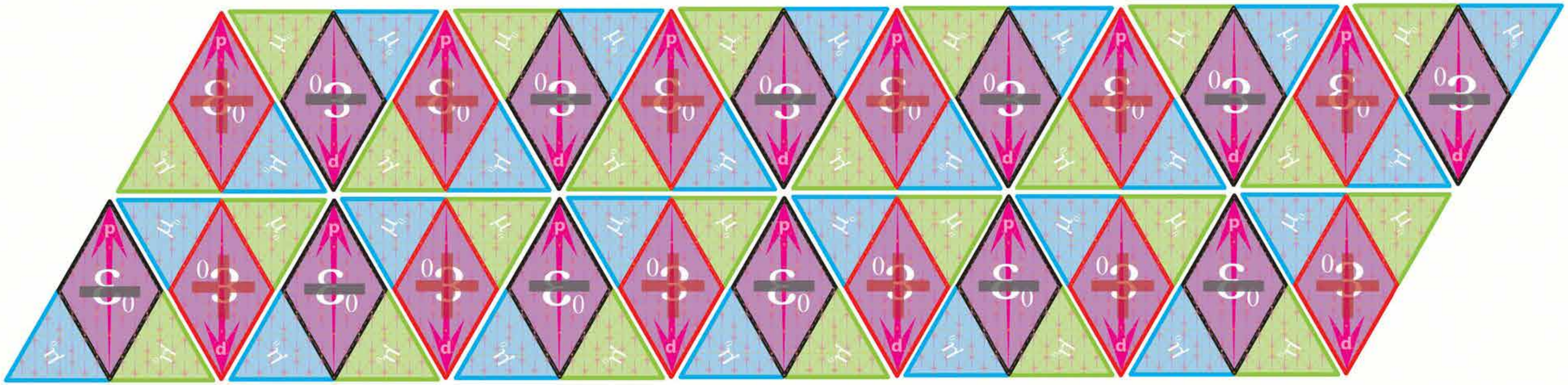
2D radiant EM mass-Energies

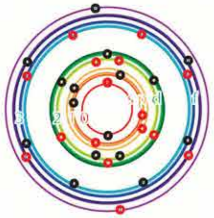


n8 - Neutral Tetryon Templates



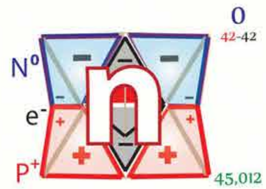
3D standing-wave Matter





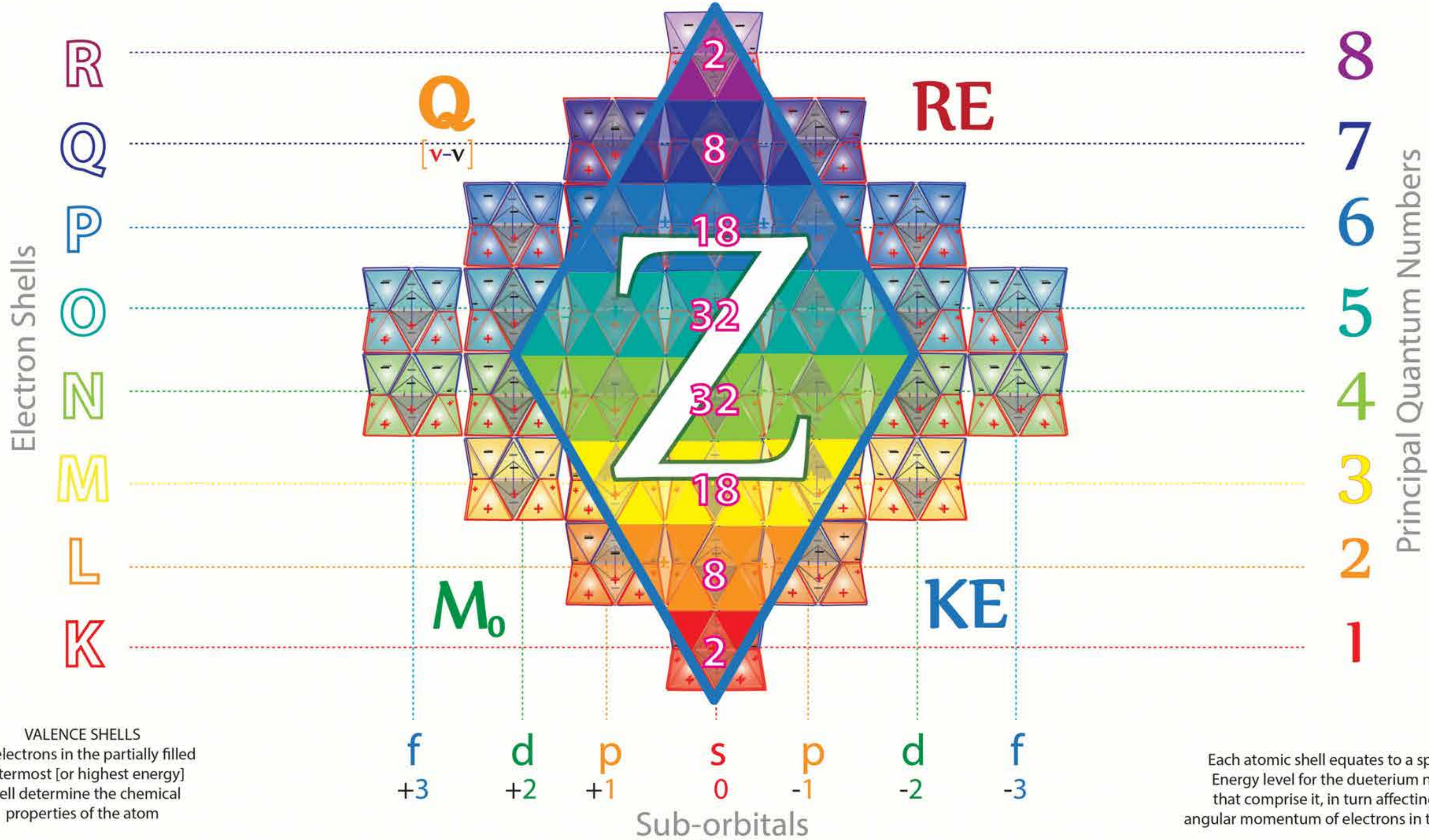
Periodic element geometries

An electron shell may be thought of as an orbit followed by electrons around an atom's nucleus.
The closest shell to the nucleus is called the "1 shell" (also called "K shell"), followed by the
"2 shell" (or "L shell"), then the "3 shell" (or "M shell"), and so on further and further from the nucleus.
The shell letters K, L, M, ... are alphabetical



Each shell consists of one or more subshells, and each subshell consists of one or more atomic orbitals.

Each shell can contain only an integer number of whole deuterium nuclei [Proton, Neutron & electron]



VALENCE SHELLS
The electrons in the partially filled outermost [or highest energy] shell determine the chemical properties of the atom

Each atomic shell equates to a specific Energy level for the dueterium nuclei that comprise it, in turn affecting the angular momentum of electrons in that shell

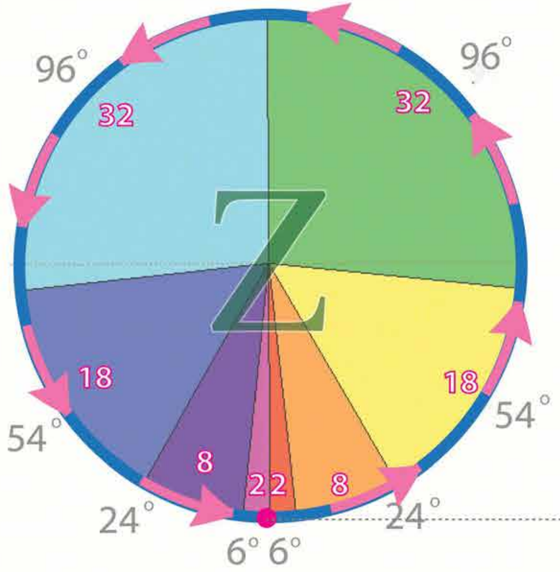
Periodic Harmonic motions

$x = A\cos(\omega t + \varphi)$

Much of the math in of modern physics
is predicated on the assumption that
π [where it appears] is related to
the properties of a circle

$F = -kx$

Circular motion

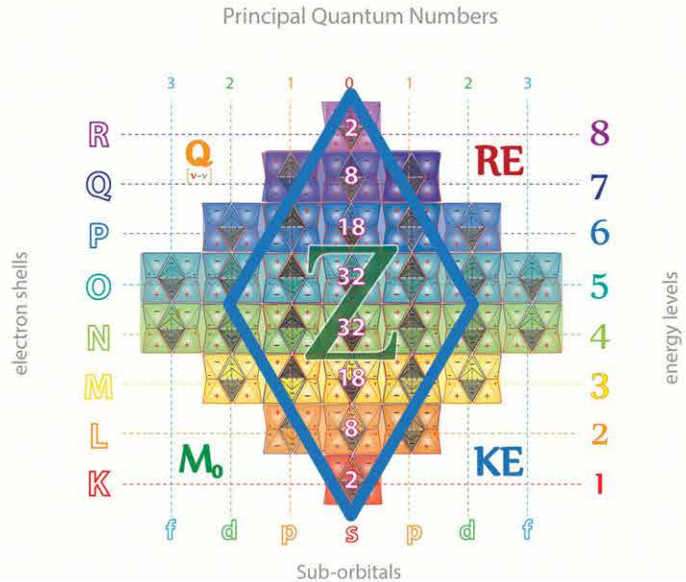


Linear motion

Simple harmonic motion can be visualized as the projection of uniform circular motion onto one axis

circular harmonic motion

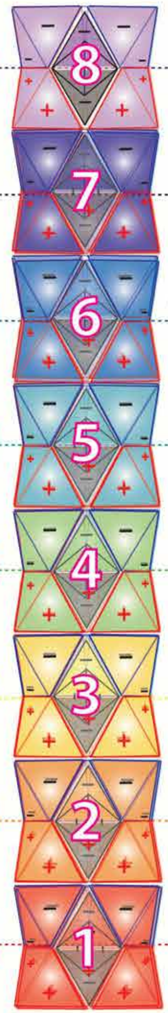
simple harmonic motion



**Circular motions describe
the motion of a body
with a changing velocity vector
[the result of an acceleration force].**

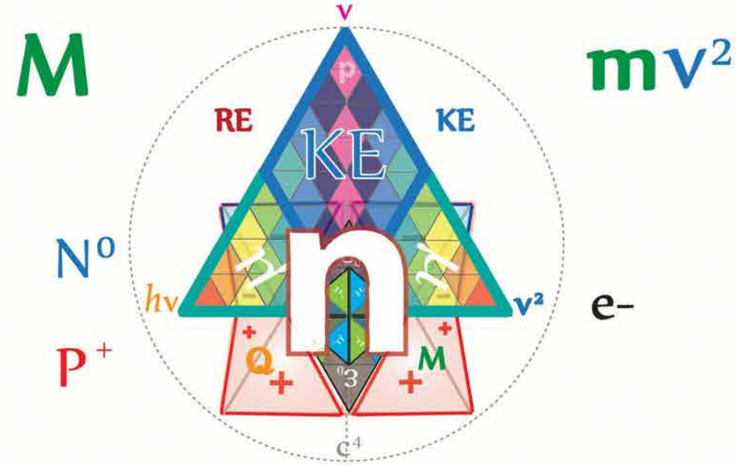
**Nuclei per shell in elements follows
a 'periodic summation rule'
that is reflective of
photonic energies**

Baryon mass-energies	E — The quantum level mass-energies of Baryons determines the kinetic energies of electrons		electron KEM field
n	1n - 1 e19v		hv^2
73,728	n32	v8	3.268969693 e15
69,192	n31	v7	2.502804921 e15
64,800	n30	v6	1.838795452 e15
60,552	n29	v5	1.276941286 e15
56,448	n28	v4	8.172424232 e14
52,488	n27	v3	4.596988631 e14
48,672	n26	v2	2.043106058 e14
45,000	n25	v1	5.107765145 e13
Compton frequencies	1.2 e20 electron rest Matter is velocity invariant		spectral frequencies
930 MeV	496 keV		13.6 eV



Atomic nuclei mass-energies

Each element's weight [mass-Matter in a gravitational field] is the result of the total quanta comprising that element



The nuclei forming each atomic shell have specific mass-energy quanta

Baryon rest masses — lepton rest mass — KEM

$$\sum_{n=1}^{8} \left[[72(n)^2] + [12e19] + [m_e v^2] \right]$$

Deuterium mass-energy per shell

Despite having differing mass-energies each Deuterium nuclei has the same velocity invariant Matter geometry [84π]

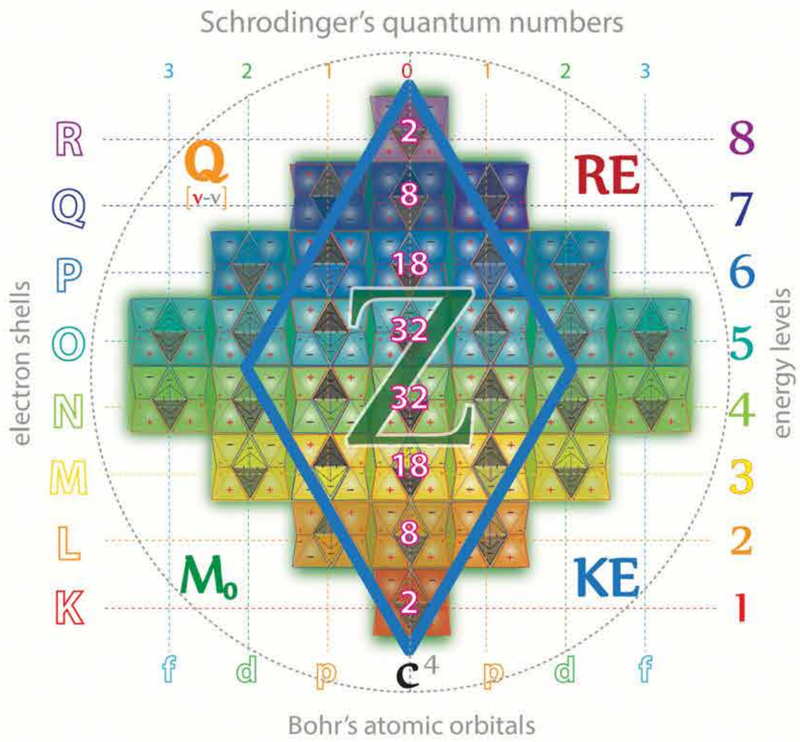
spin orbital coupling in synchronous quantum convertors

Electrons act as quantum scale rotating armatures in atomic nuclei and can only have specific energies reflective of the electron orbital energy level of the Baryons in which they are found

They acheive these energy levels by absorbing or emitting photons to acheive the specific angular momentum required

Baryons **930.947 MeV** + **KEM fields** **13.525 ev** + **electrons** **496.519 keV**

Mapping Planck mass-energy contributions to elementary Matter and isotopes



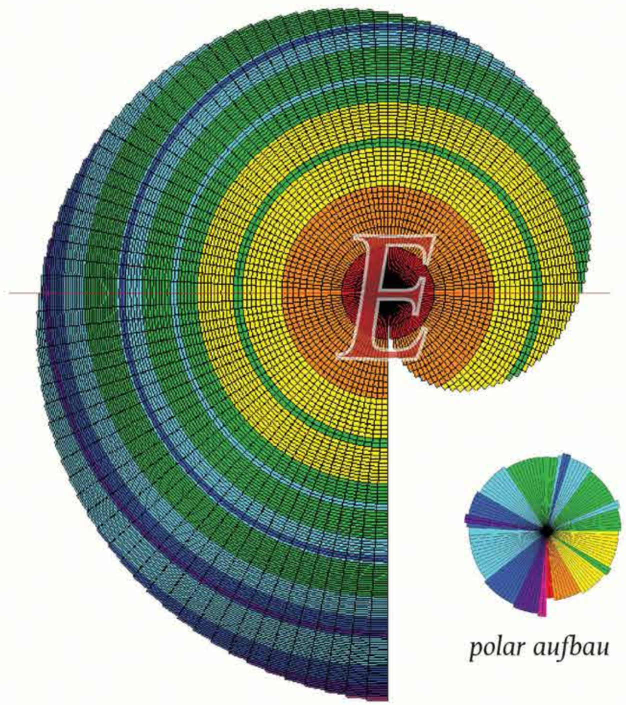
$$E = hv^2$$

$$n^2 + v^2 + e = Z$$

general form quatratic equation

$$ax^2 + bx + c = Z$$

$$E = nhv$$



polar energy spirals courtesy of Rene Cormier

Identifying electron rest Matter topologies as velocity invariant we can re-arrange the component Planck mass-energy geometry formulation of periodic elements to

h[**72[v²]** (Deuteron rest mass) + **v** (Spectral lines) + **1.20 e20 v** (electron rest mass)]

reveal a quadratic formulation for all Z numbers

$$\sum_{K}^{R} \quad \text{nuclei per shell}$$

$${}^{P}\sum_{K}^{R} Z$$

Periodic Summation

Periodic summation is a notation developed for Tetryonic theory to model the geometric series addtion of Z[n²] energy level Deuterium nuclei that form the periodic elements

$$\sum_{1}^{120} Z \quad \text{element number}$$

STEP ONE

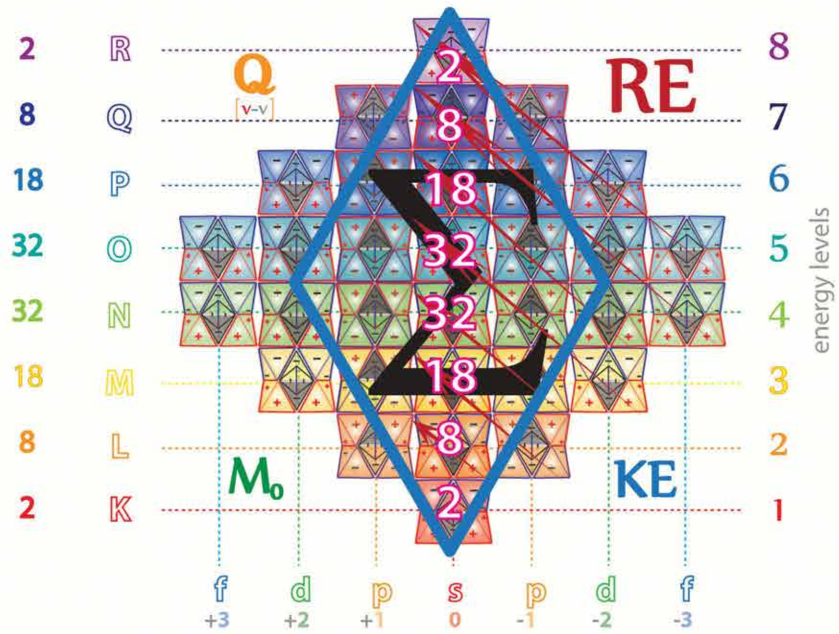
Periodic summation follows the atomic shell electron config

STEP TWO

Periodic elements build up following the aufbau sequence

$$ {}^{P}\sum_{K}^{R} 2(x^2) = $$

1	R
2	
3	
4	
4	
3	
2	
1	K



$^{P}\sum R = 2$	2 nuclei [74,496 ea]	120	Unbinilium
+			
$^{P}\sum Q = 8$	8 nuclei [69,780 ea]	118	Ununoctium
+			
$^{P}\sum P = 18$	18 nuclei [65,232 ea]	110	Darmstadtium
+			
$^{P}\sum O = 32$	32 nuclei [60,852 ea]	92	Uranium
+			
$^{P}\sum N = 32$	32 nuclei [56,640 ea]	60	Neodymuim
+			
$^{P}\sum M = 18$	18 nuclei [52,596 ea]	28	Argon
+			
$^{P}\sum L = 8$	8 nuclei [48,720 ea]	10	Neon
+			
$^{P}\sum K = 2$	2 nuclei [45,012 ea]	2	Helium
		0	Hydrogen

Each atomic shell can hold only a fixed number of deuterium nuclei

THe LHS of the notation determine the number of nuclei in each atomic shell, from the periodic mass-energy levels for atoms, and the RHS follows the aufbau building principle to determine the rest mass-Matter of any specific element

Aufbau

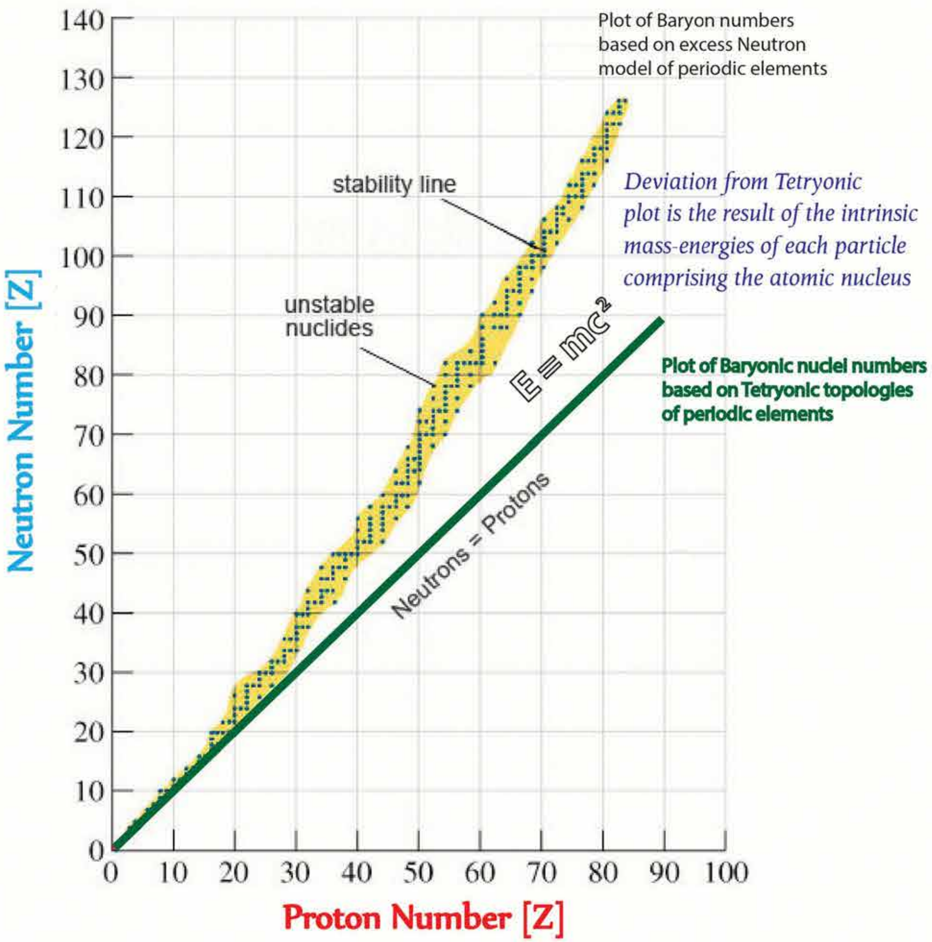
Each periodic element is made of Z [n² energy] deuterium nuclei

Z# [z Protons [24-12] ; z Neutrons [18-18] ; z electrons [0-12]] n1-8

Planck mass-energies form the surface integral of rest Matter topologies for each periodic element

Proton - Neutron Curve

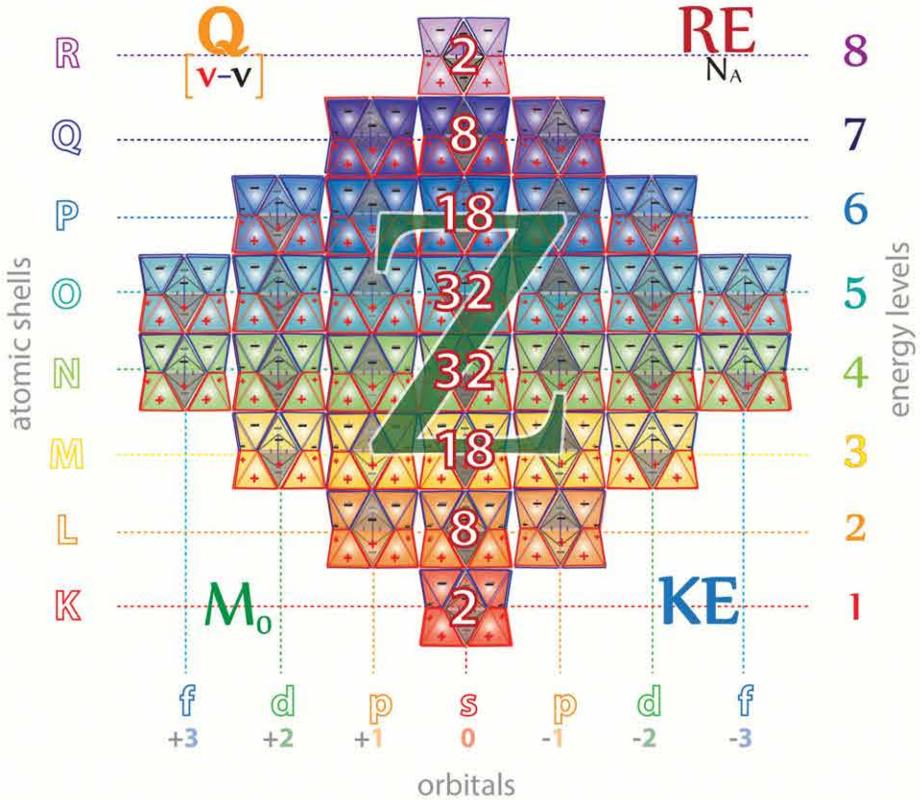
The graph below is a plot of neutron number against proton number.
It is used as rule to determine which nuclei are stable or unstable.



Historically, Proton-electron numbers are viewed as being equivalent in neutral elementary matter with the excess molar mass measured being the result of 'excess or extra' Neutrons in the atom

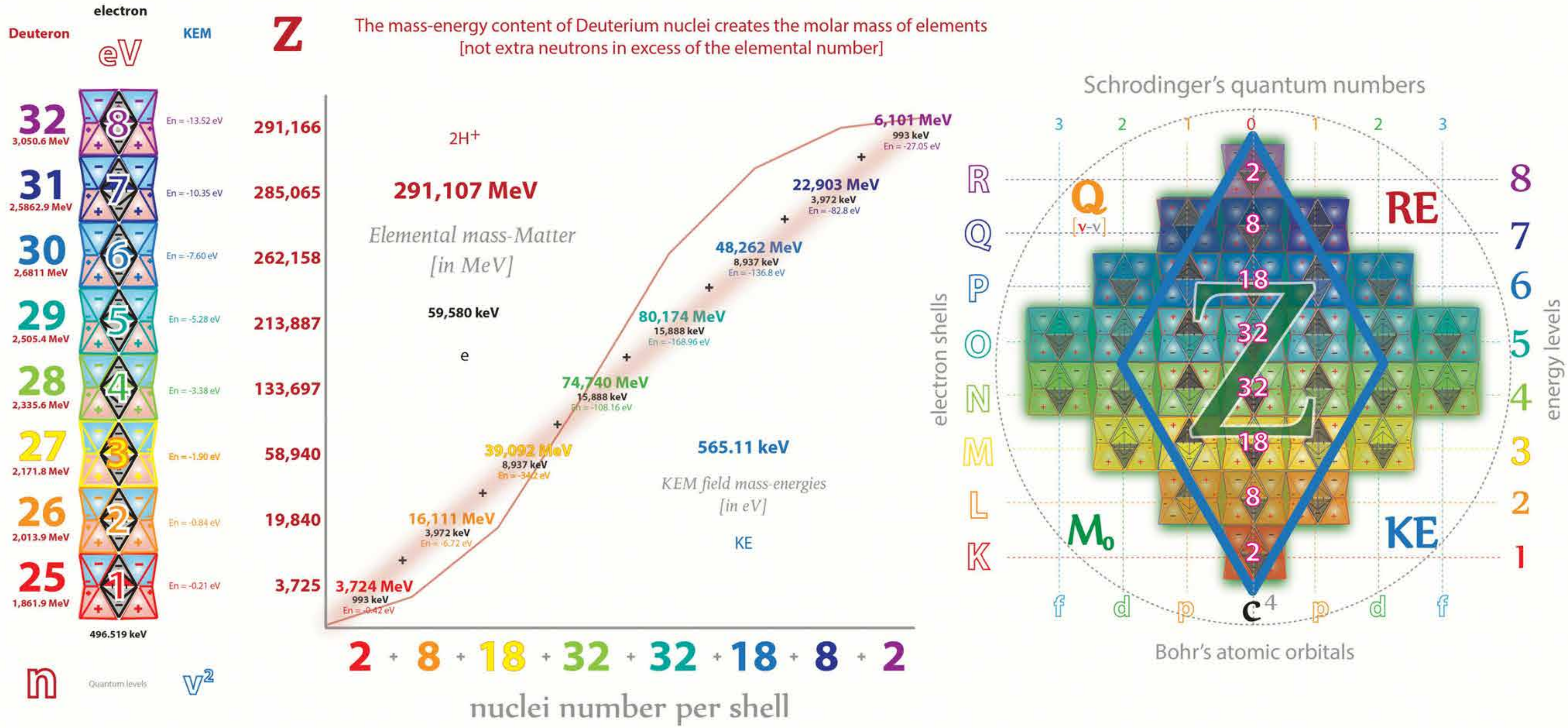
Atomic Nuclei Numbers

All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies



Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

Planck mass-energy contributions to elementary Matter and isotopes



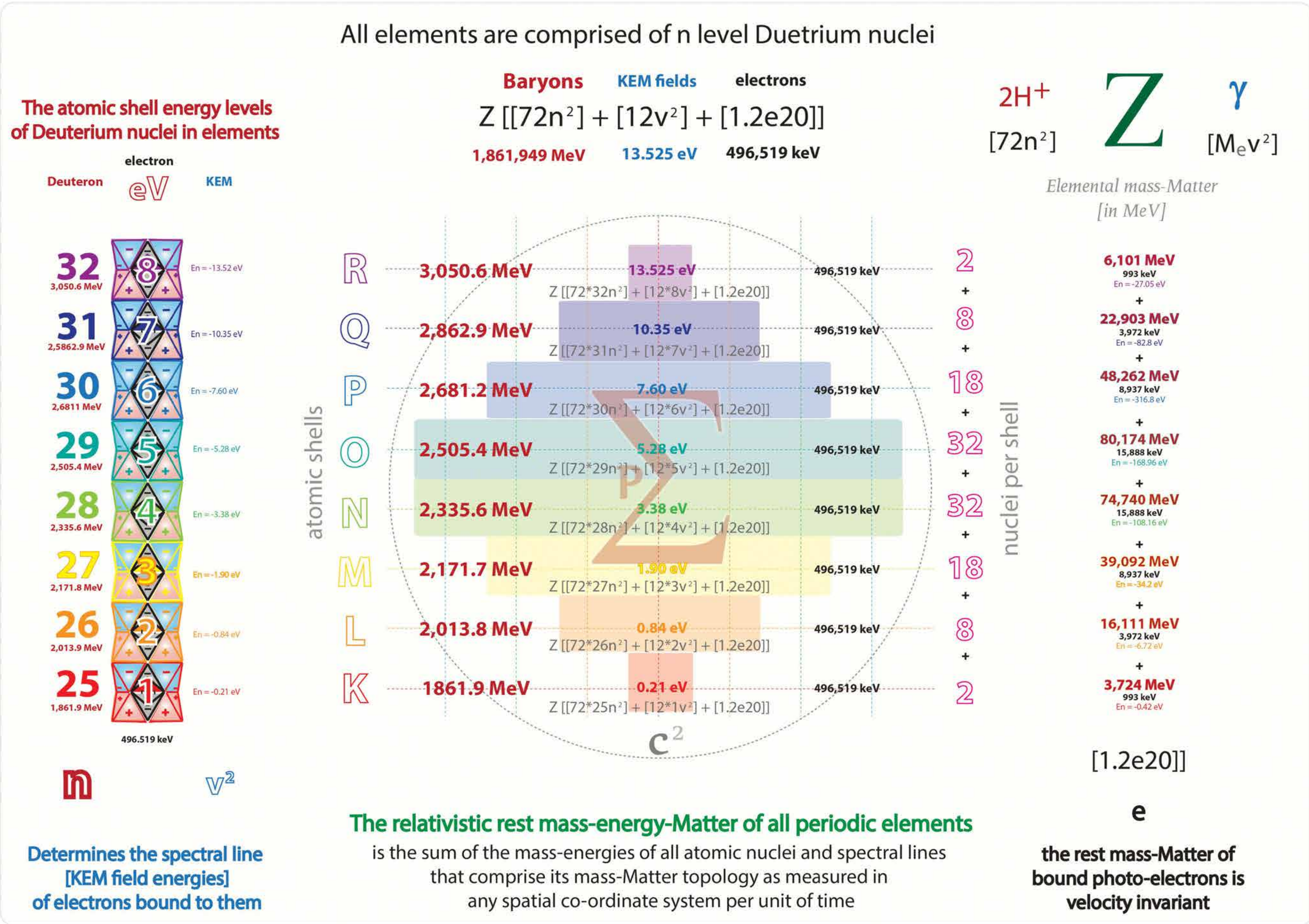
n1 Elementary nuclei

are comprised of equal numbers of Protons, Neutrons & electrons with varying energy levels

Baryons		electrons		KEM fields
930.947 MeV	+	**496.519 keV**	+	**13.525 ev**

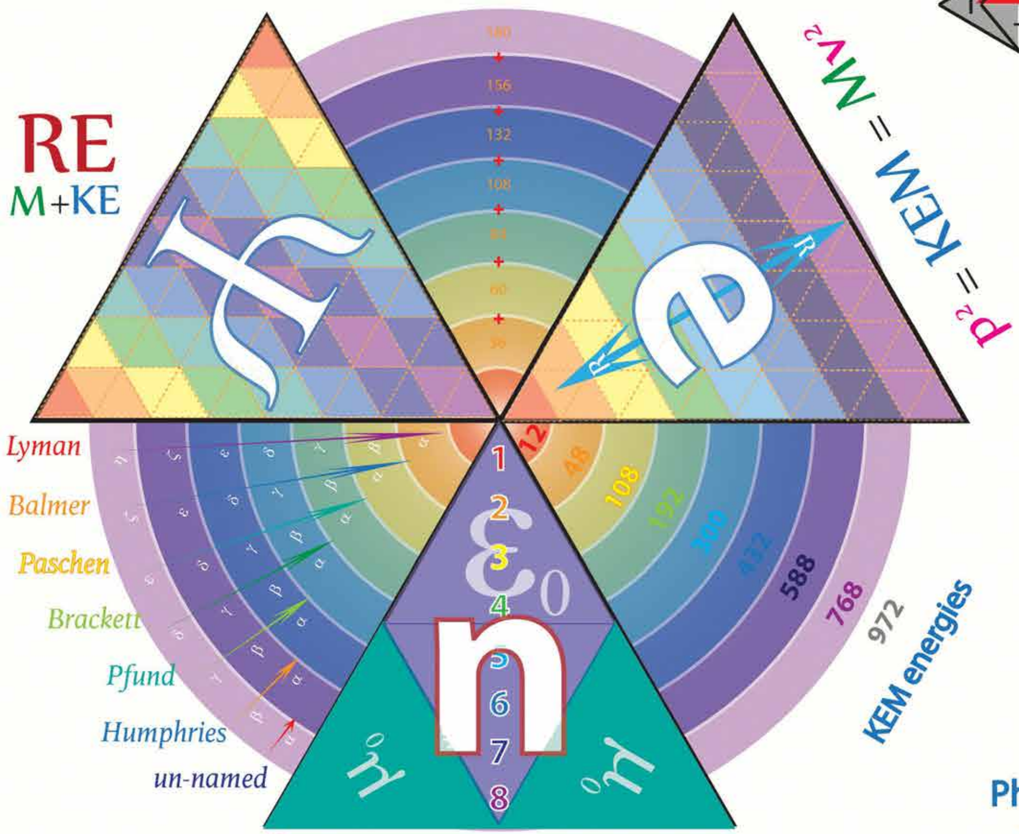
The mass-energy content of Matter topologies is velocity invariant

The mass-energy content of Baryons determines the KEM field of electrons


All elements are comprised of n level Duetrium nuclei
Baryons KEM fields electrons
Z [[72n²] + [12v²] + [1.2e20]]
1,861,949 MeV 13.525 eV 496,519 keV
2H+ [72n²]
Z
γ [Mev²]
Elemental mass-Matter [in MeV]
The atomic shell energy levels of Deuterium nuclei in elements
Deuteron
electron eV
KEM
32 3,050.6 MeV En = -13.52 eV
31 2,5862.9 MeV En = -10.35 eV
30 2,6811 MeV En = -7.60 eV
29 2,505.4 MeV En = -5.28 eV
28 2,335.6 MeV En = -3.38 eV
27 2,171.8 MeV En = -1.90 eV
26 2,013.9 MeV En = -0.84 eV
25 1,861.9 MeV En = -0.21 eV
496.519 keV
n
v²
atomic shells
R 3,050.6 MeV 13.525 eV 496,519 keV Z [[72*32n²] + [12*8v²] + [1.2e20]] 2
Q 2,862.9 MeV 10.35 eV 496,519 keV Z [[72*31n²] + [12*7v²] + [1.2e20]] 8
P 2,681.2 MeV 7.60 eV 496,519 keV Z [[72*30n²] + [12*6v²] + [1.2e20]] 18
O 2,505.4 MeV 5.28 eV 496,519 keV Z [[72*29n²] + [12*5v²] + [1.2e20]] 32
N 2,335.6 MeV 3.38 eV 496,519 keV Z [[72*28n²] + [12*4v²] + [1.2e20]] 32
M 2,171.7 MeV 1.90 eV 496,519 keV Z [[72*27n²] + [12*3v²] + [1.2e20]] 18
L 2,013.8 MeV 0.84 eV 496,519 keV Z [[72*26n²] + [12*2v²] + [1.2e20]] 8
K 1861.9 MeV 0.21 eV 496,519 keV Z [[72*25n²] + [12*1v²] + [1.2e20]] 2
c²
nuclei per shell
6,101 MeV 993 keV En = -27.05 eV
22,903 MeV 3,972 keV En = -82.8 eV
48,262 MeV 8,937 keV En = -316.8 eV
80,174 MeV 15,888 keV En = -168.96 eV
74,740 MeV 15,888 keV En = -108.16 eV
39,092 MeV 8,937 keV En = -34.2 eV
16,111 MeV 3,972 keV En = -6.72 eV
3,724 MeV 993 keV En = -0.42 eV
[1.2e20]]
e
Determines the spectral line [KEM field energies] of electrons bound to them
The relativistic rest mass-energy-Matter of all periodic elements
is the sum of the mass-energies of all atomic nuclei and spectral lines that comprise its mass-Matter topology as measured in any spatial co-ordinate system per unit of time
the rest mass-Matter of bound photo-electrons is velocity invariant

Ionisation energies

Fractional quantum differentials



$$hf = \Delta Mv = \Delta p$$

spectral lines are produced by accelerating electrons

Note: this is an Illustrative schema for modelling KEM field energies
All KEM fields possess the same physical spatial geometry
in radial-time defined spatial co-ordinate systems

c^2 c^4

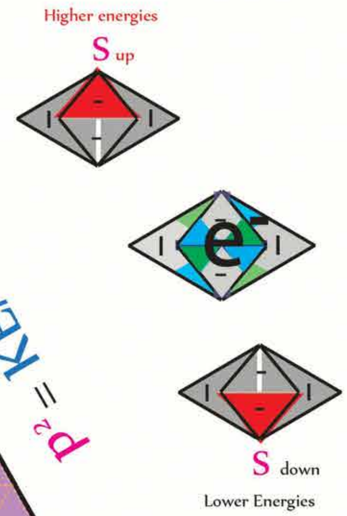


Photo-electrons absorb/emit spectral energies

$$E = eV = \frac{1}{4\pi\epsilon_0}\frac{ne^2}{a}$$

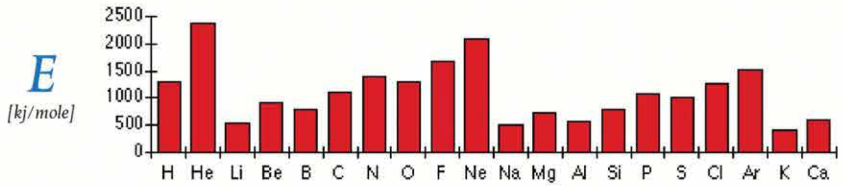
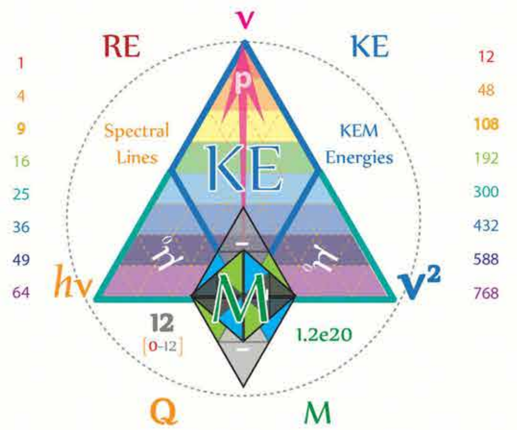


photo-electronic energy momenta

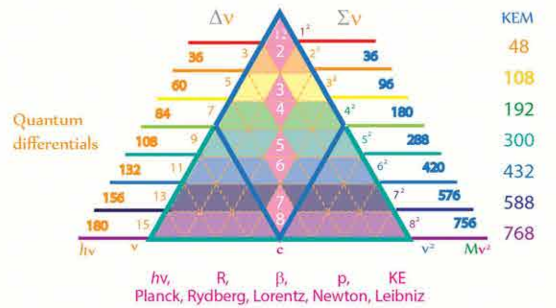


Mapping photo-electron transition energies to Tetryonic energy momenta geometries reveals many key facts about the ionisation energies of nuclei

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

The differing fractional KEM field energy momenta of electrons that results from their transitions to specific energy nuclei in elements results in differing QAM quanta and produces spectral lines and fine line splitting

Spectral line transitions



hv, R, β, p, KE
Planck, Rydberg, Lorentz, Newton, Leibniz

uniting classical physics and relativity through equilateral geometry

Element numbers

Nuclei per shell in elements follow a 'periodic summation rule' that is reflective of photonic energies

$$P\sum_{K}^{R} 2(x^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

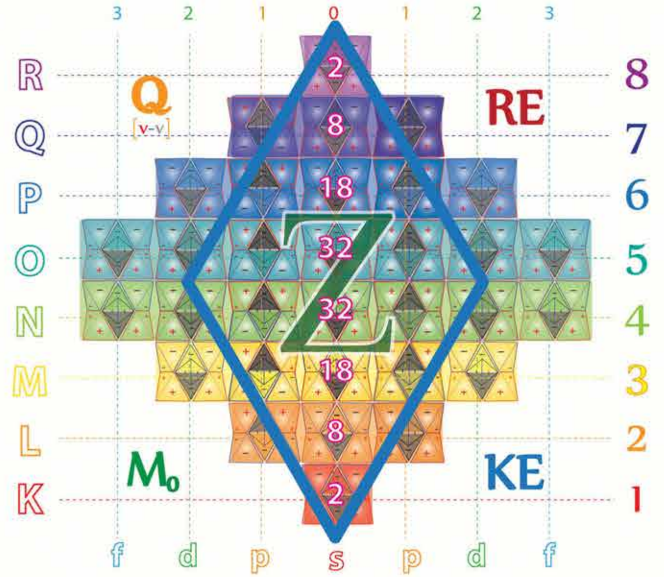
(R 1, Q 2, P 3, O 4, N 4, M 3, L 2, K 1)

Z

120 Unbinilium 119 Ununennium	n8	
118 Ununoctium 87 Francium	n7	
112 Copernicium 55 Caesium	n6	
102 Nobelium 37 Rubidium	n5	
70 Ytterbuim 19 Potassium	n4	
30 Zinc 11 Sodium	n3	
10 Neon 3 Lithium	n2	
2 Helium 1 Deuterium	n1	

Hydrogen 0

Principal Quantum Numbers



Sub-orbitals

Periodic mass-ENERGY-Matter

Following periodic summation rules for shell filling n[1-8] quantum energy deuterium nuclei combine to form elementary Matter

$$_{K}^{R}P\sum_{25}^{32}\Big[[72(n)^2]+[12e19]+[m_e v^2]\Big]_1^8$$

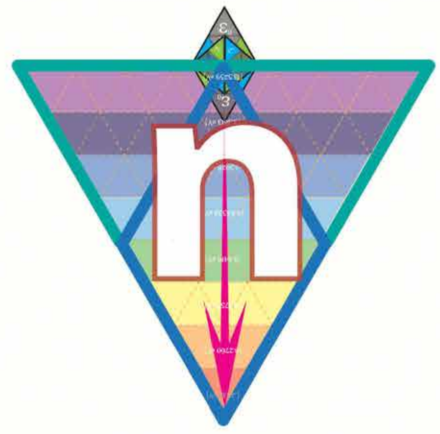
Baryon rest masses — lepton rest mass — KEM

Deuterium mass-energy per shell

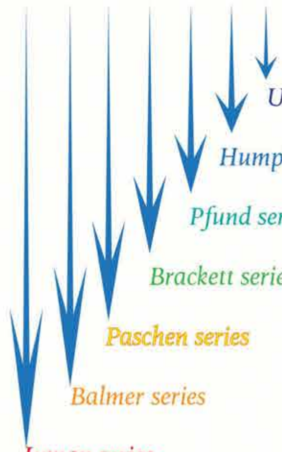
The measured weight of Matter in gravitational fields is the result of planar mass-energies in tetryonic standing-wave geometries

The periodicity of all the elements, along with their exact molar rest mass-energies and quantum wavefunctions can be described with Tetryonic geometries

Ionisation energies

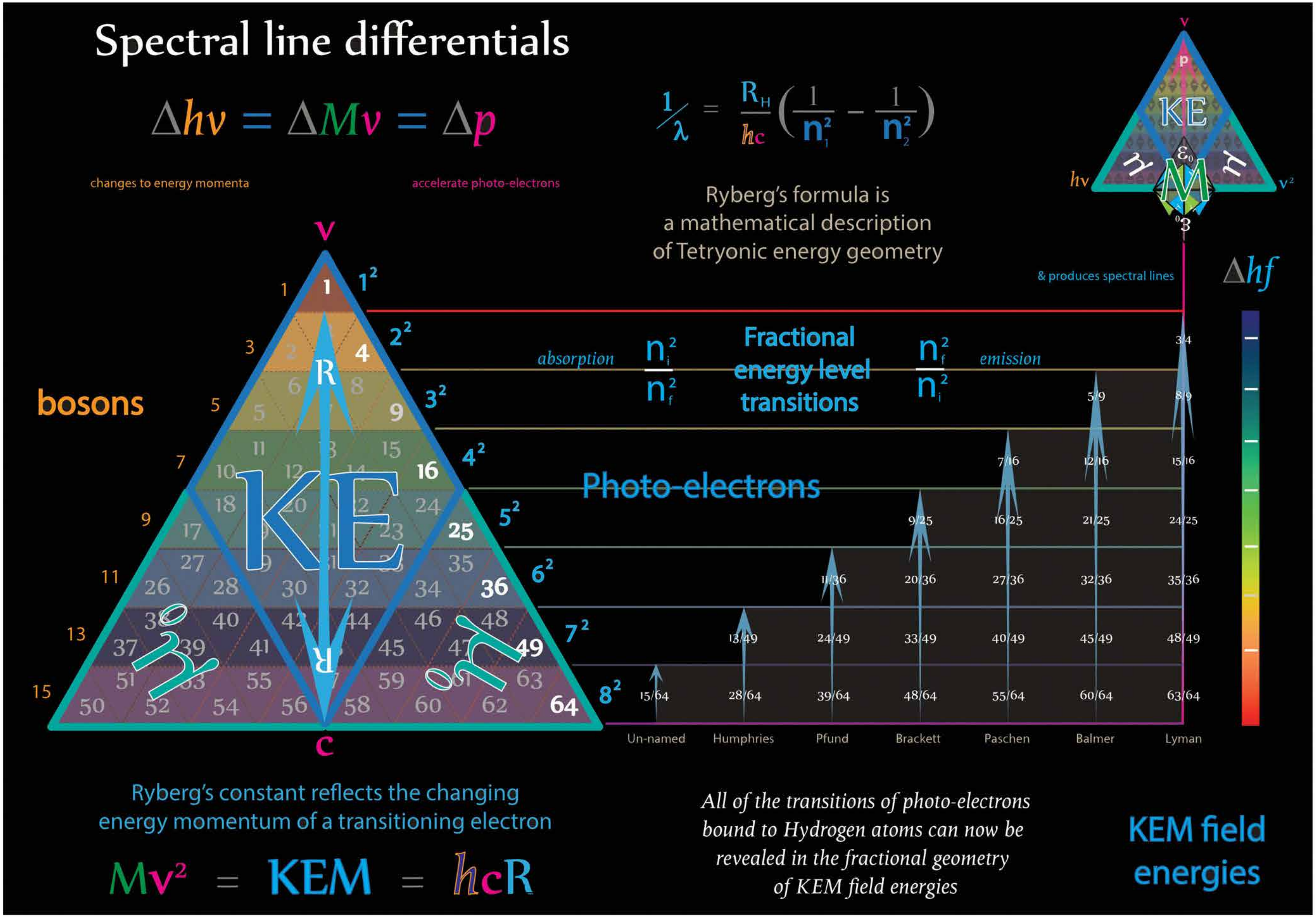


γ



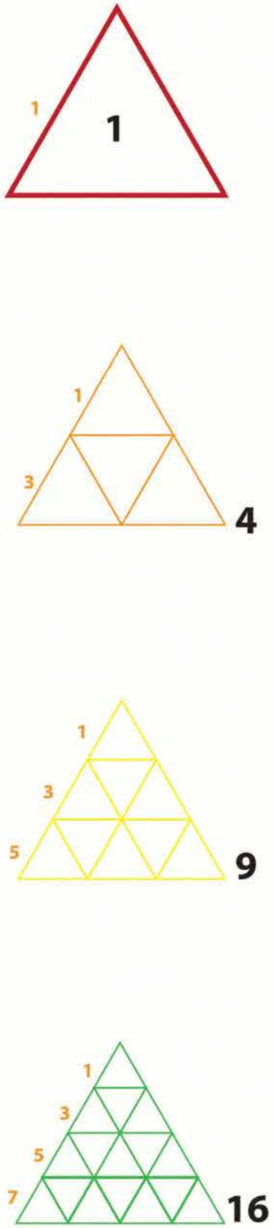
$$Mv^2 = KEM = hcR_H$$

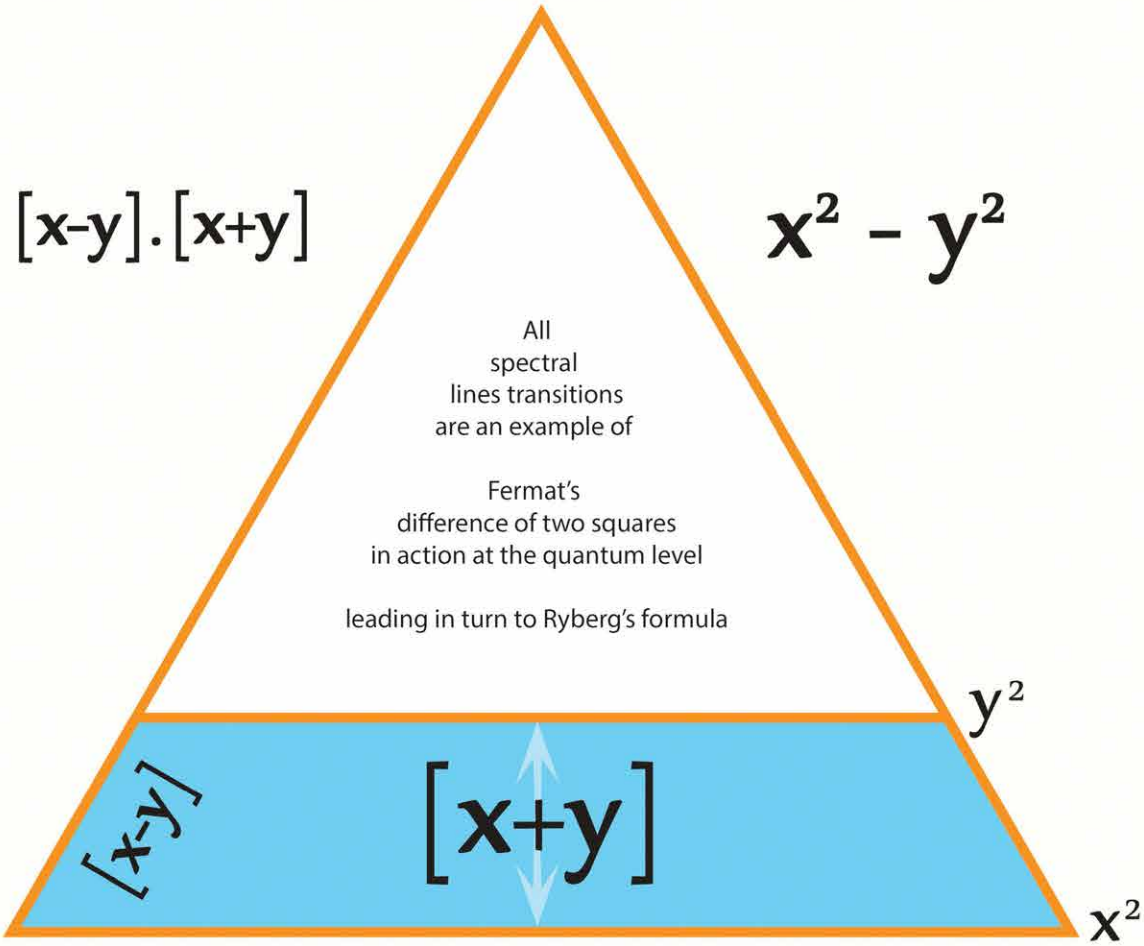
Photon emission/absorption

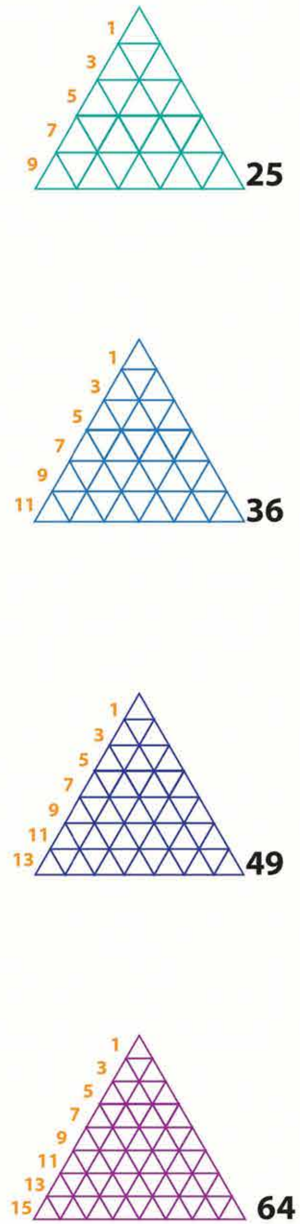

Spectral line differentials
Δhv = ΔMv = Δp
changes to energy momenta
accelerate photo-electrons
1/λ = R_H/hc (1/n₁² − 1/n₂²)
Ryberg's formula is
a mathematical description
of Tetryonic energy geometry
& produces spectral lines
Δhf
bosons
KE
absorption
emission
Fractional
energy level
transitions
Photo-electrons
Un-named
Humphries
Pfund
Brackett
Paschen
Balmer
Lyman
Ryberg's constant reflects the changing
energy momentum of a transitioning electron
Mv² = KEM = hcR
All of the transitions of photo-electrons
bound to Hydrogen atoms can now be
revealed in the fractional geometry
of KEM field energies
KEM field
energies

Fermat’s method of Factoring

also known as ‘the difference of two squares’ is used to factorise large numbers







Fermat knew that every odd number could be written as the difference of two squares
or as revealed geometrically through Tetryonic theory’s equilateral geometry,
every ‘SQUARE’ number is the sequential sum of ODD numbers

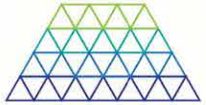
Fractions

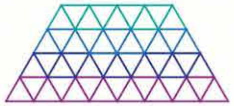
A fraction is a number that shows how many equal parts there are

In quantum mechanics fractions appear in quantum steps
as a result of the equilateral geometry of Planck energy momenta

3/4 

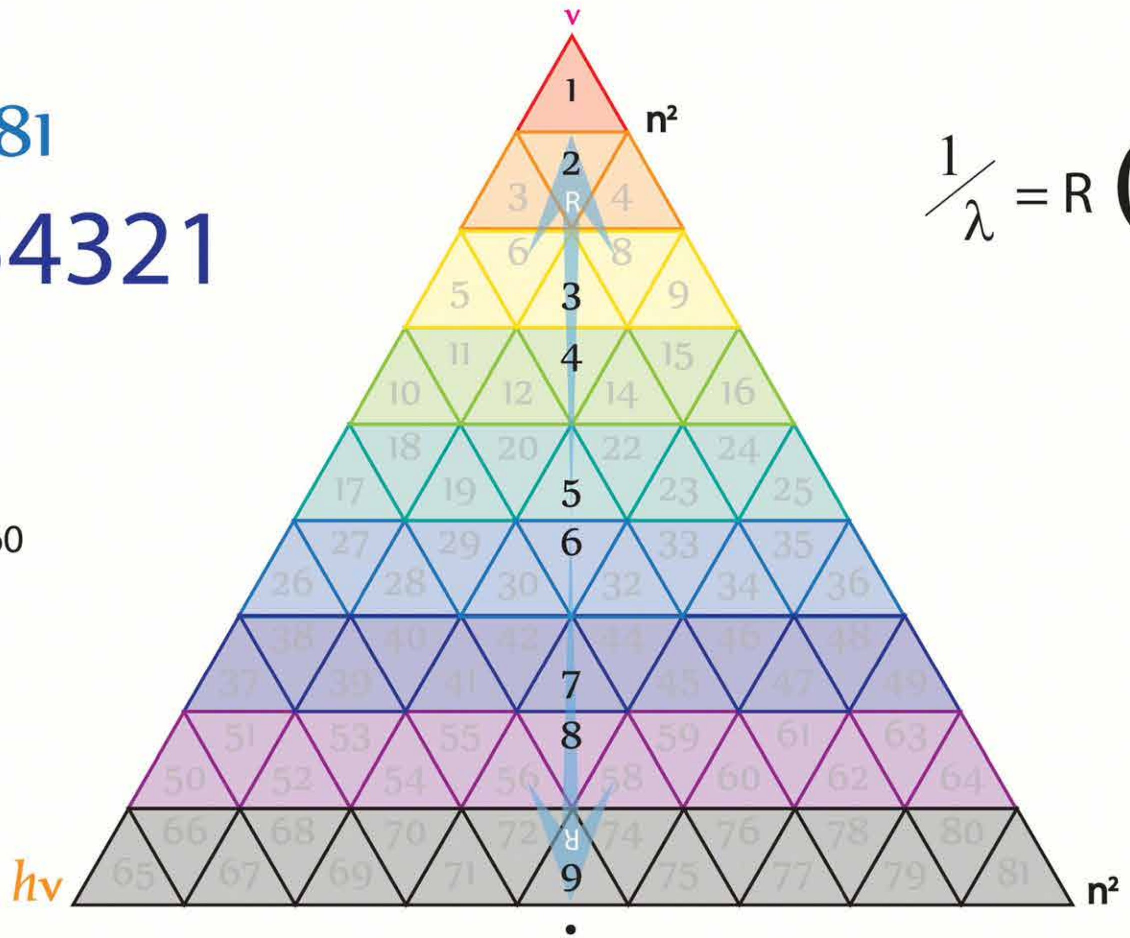
24/25 

 40/49

 48/64

80/81

.987654321



$$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{81}\right)$$

.987654321

Cos 60

.5

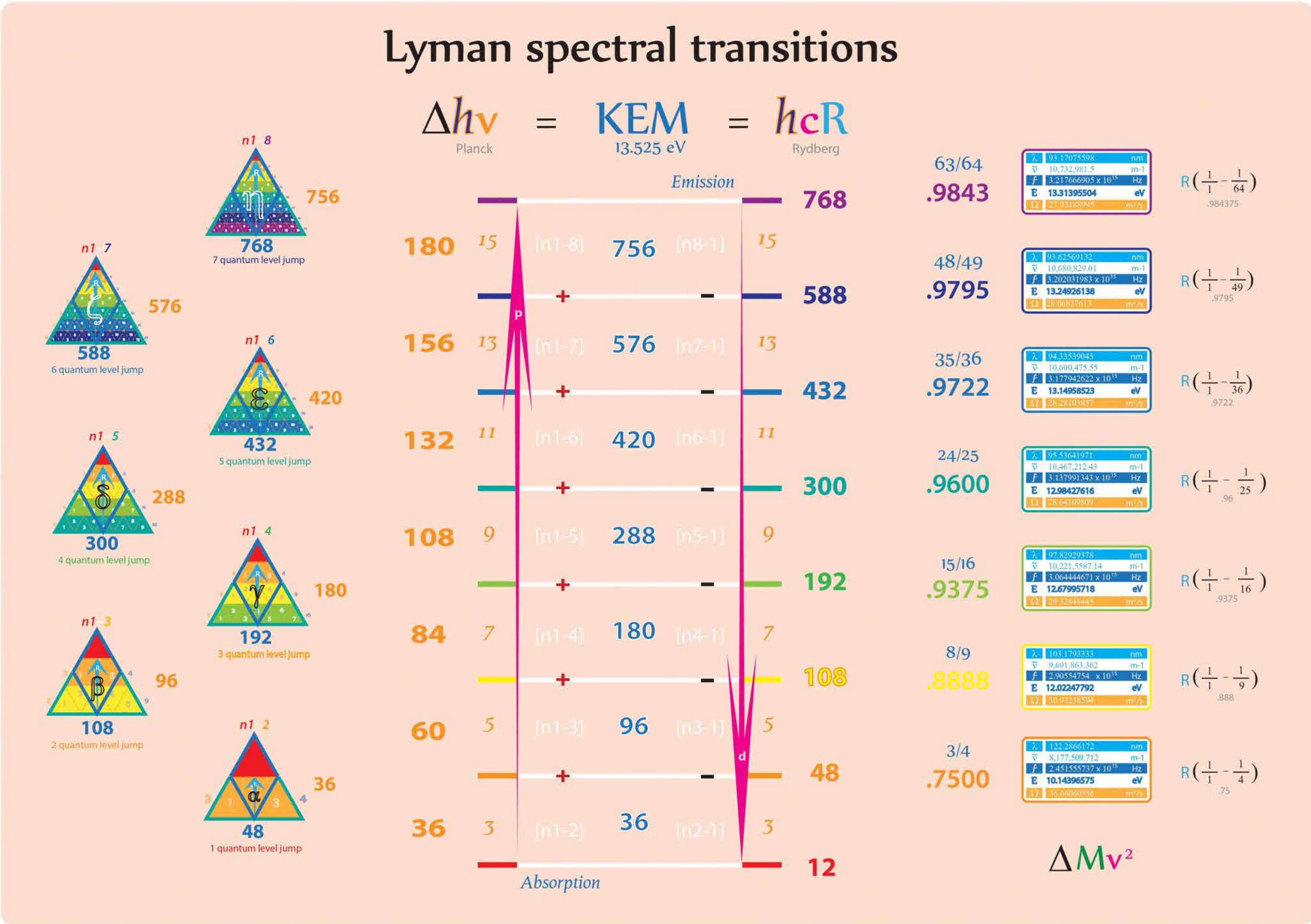
1/2

Sin 60

.866025403

$\sqrt{3}/2$

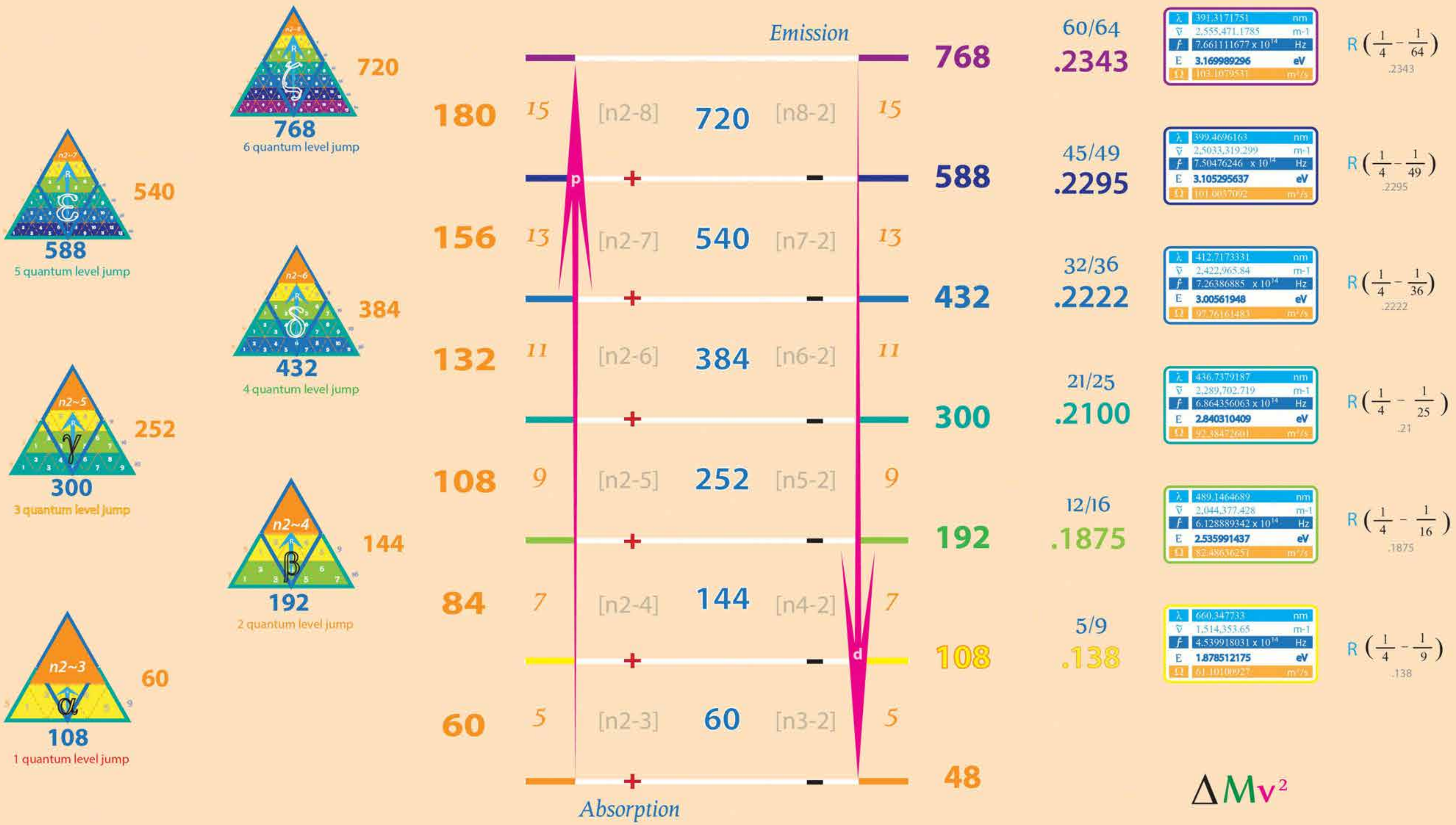
Tetryonic geometry explains the fractional mathematics of Rydberg's formula


Lyman spectral transitions
Δhv = KEM = hcR
Planck
13.525 eV
Rydberg
Emission
Absorption
n1 8
756
768
7 quantum level jump
n1 7
576
588
6 quantum level jump
n1 6
420
432
5 quantum level jump
n1 5
288
300
4 quantum level jump
n1 4
180
192
3 quantum level jump
n1 3
96
108
2 quantum level jump
n1 2
36
48
1 quantum level jump
180 15 [n1-8] 756 [n8-1] 15
156 13 [n1-7] 576 [n7-1] 13
132 11 [n1-6] 420 [n6-1] 11
108 9 [n1-5] 288 [n5-1] 9
84 7 [n1-4] 180 [n4-1] 7
60 5 [n1-3] 96 [n3-1] 5
36 3 [n1-2] 36 [n2-1] 3
768
588
432
300
192
108
48
12
63/64 .9843
48/49 .9795
35/36 .9722
24/25 .9600
15/16 .9375
8/9 .8888
3/4 .7500
ΔMv²

Balmer spectral transitions

$\Delta h\nu$ = KEM = hcR

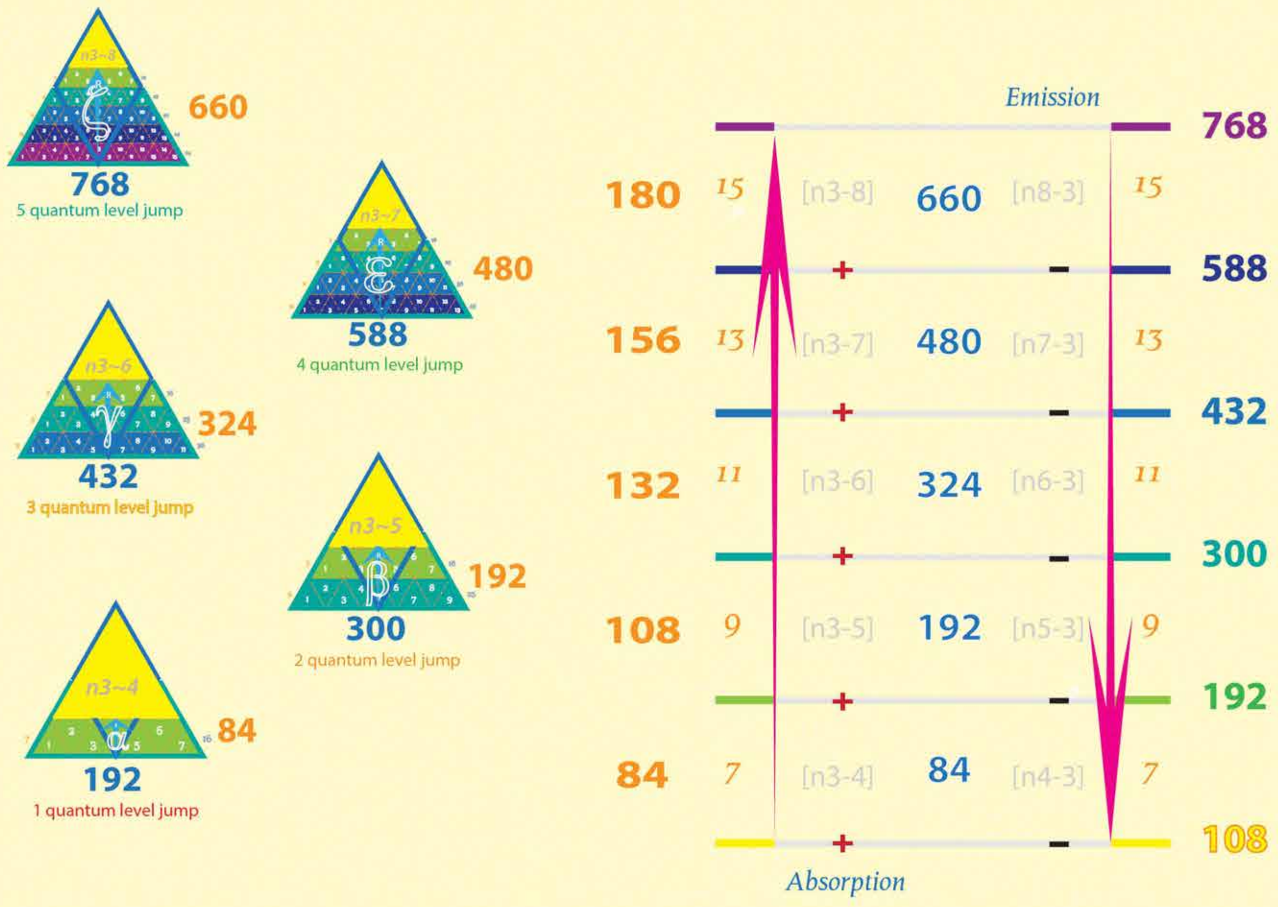
Planck — 3.381 eV — Rydberg



Paschen spectral transitions

Δhv = KEM = hcR

Planck — 1.502 eV — Rydberg



55/64
.0954

λ	960.5057935	nm
ṽ	1,041,118.135	m-1
f	3.121193646 x 10^{14}	Hz
E	1.29147712	eV
Ω	287.9523928	m^2/s

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

40/49
.0907

λ	1,011.157466	nm
ṽ	988,965.6492	m-1
f	2.9464844428 x 10^{14}	Hz
E	1.226783461	eV
Ω	303.1373822	m^2/s

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

27/36
.8033

λ	1,100.579555	nm
ṽ	908,612.1902	m-1
f	2.723950819 x 10^{14}	Hz
E	1.127107305	eV
Ω	329.94545	m^2/s

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

16/25
.0711

λ	1,289.741666	nm
ṽ	775,349.069	m-1
f	2.324438032 x 10^{14}	Hz
E	0.961798233	eV
Ω	386.6548243	m^2/s

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

7/16
.0486

λ	1,886.707809	nm
ṽ	530,023.7776	m-1
f	1.588971311 x 10^{14}	Hz
E	0.657479261	eV
Ω	565.6207715	m^2/s

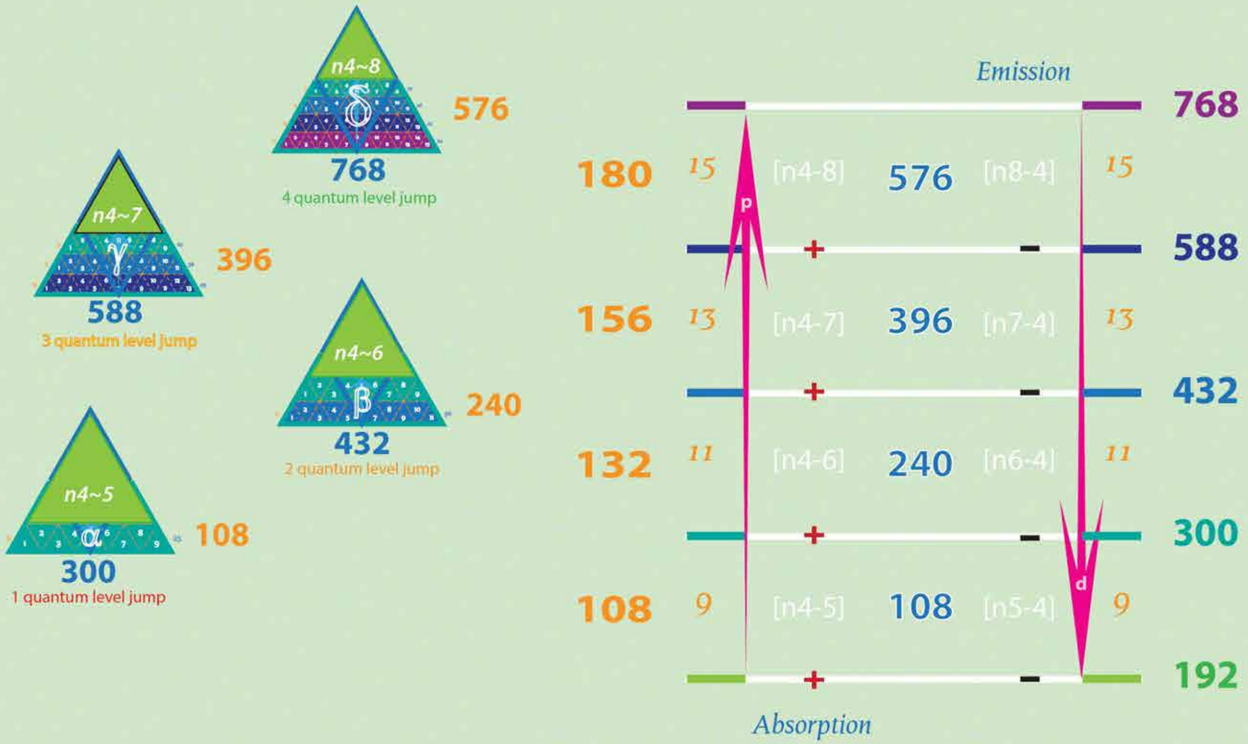
$R\left(\frac{1}{9}-\frac{1}{16}\right)$ .0486

ΔMv^2

Brackett spectral transitions

$\Delta h\nu$ = KEM = hcR

Planck · 0.8451 eV · Rydberg



48/64
.0468

λ	1,956.585876	nm
ṽ	511,094.357	m-1
ƒ	1.532222335 x 10 14	Hz
E	0.634001085	eV
Ω	586.569689	m²/s

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

33/49
.04209

λ	2,178.92518	nm
ṽ	458,941.8716	m-1
ƒ	1.375873118 x 10 14	Hz
E	0.569307096	eV
Ω	653.2253354	m²/s

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

20/36
.0347

λ	2,641.390932	nm
ṽ	378,588.4126	m-1
ƒ	1.134979508 x 10 14	Hz
E	0.469630433	eV
Ω	791.8690801	m²/s

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

9/25
.0225

λ	4,076.220574	nm
ṽ	245,325.2914	m-1
ƒ	7.35466721x 10 13	Hz
E	0.30432052	eV
Ω	1,222.020185	m²/s

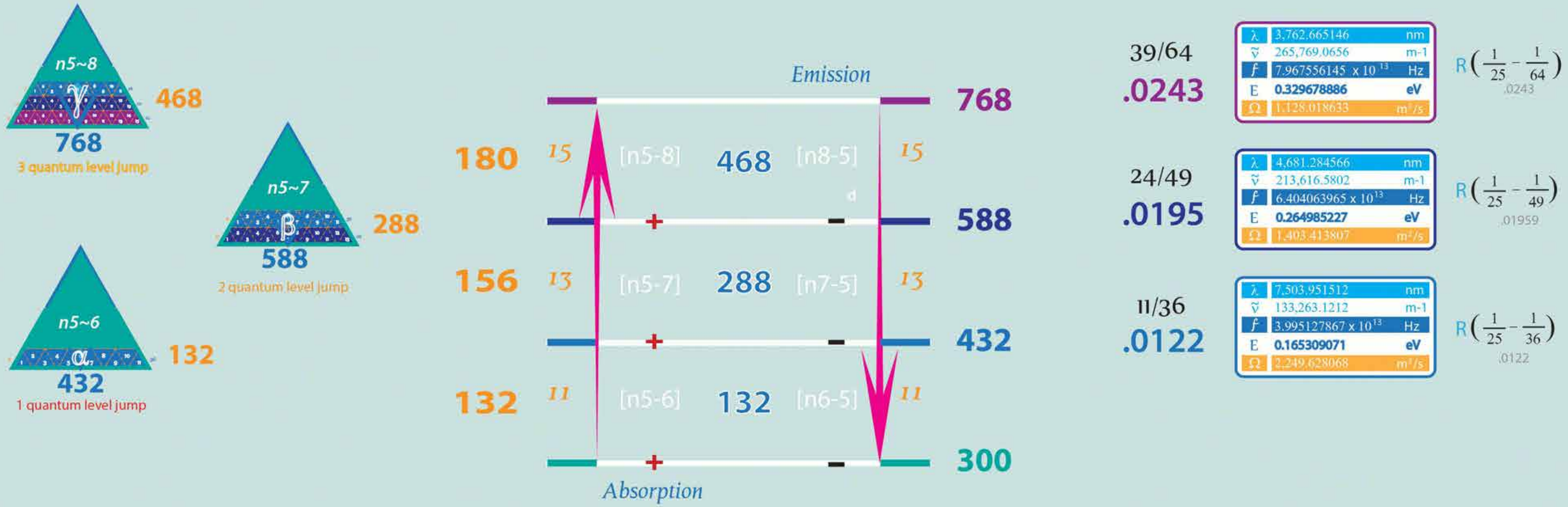
$R\left(\frac{1}{16}-\frac{1}{25}\right)$ .0225

ΔMv^2

Pfund spectral transitions

$\Delta h\nu$ = KEM = hcR

Planck — 0.541 eV — Rydberg

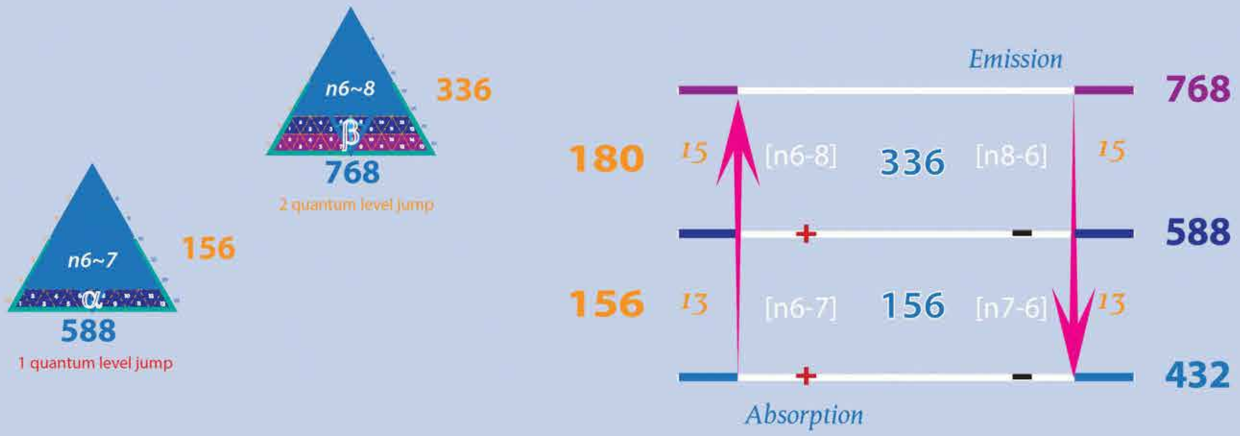


$\Delta M v^2$

Humphreys spectral transitions

$$\Delta h\nu \;=\; KEM \;=\; hcR$$

Planck — 0.375 eV — Rydberg



28/64

.01215

λ	7,546.831235	nm
ṽ	132,505.9444	m-1
ƒ	3.972428277 x 10^{13}	Hz
E	**0.164369815**	**eV**
Ω	1,128.018633	m^2/s

$R\left(\frac{1}{36} - \frac{1}{64}\right)$

.01215

13/49

.00733

λ	12,445.01497	nm
ṽ	80,353.459	m-1
ƒ	2.4089936098x 10^{13}	Hz
E	**0.099676156**	**eV**
Ω	1,403.413807	m^2/s

$R\left(\frac{1}{36} - \frac{1}{49}\right)$

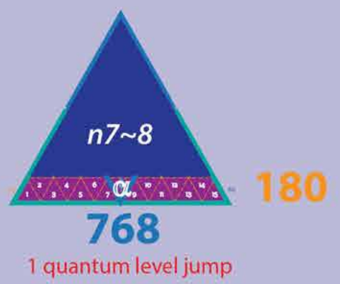
.0073

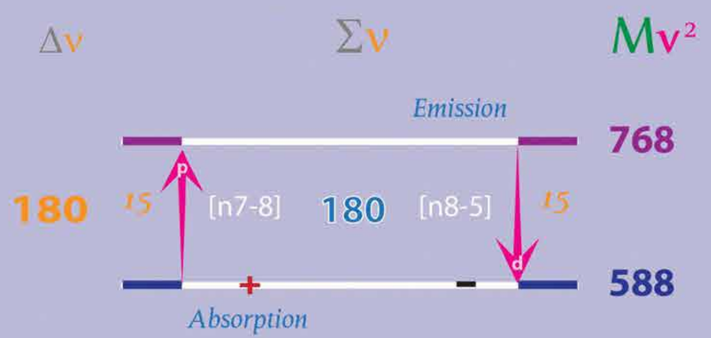
ΔMv^2

Un-named spectral transition

$\Delta h\nu$ = KEM = hcR

Planck — 0.276 eV — Rydberg





15/64

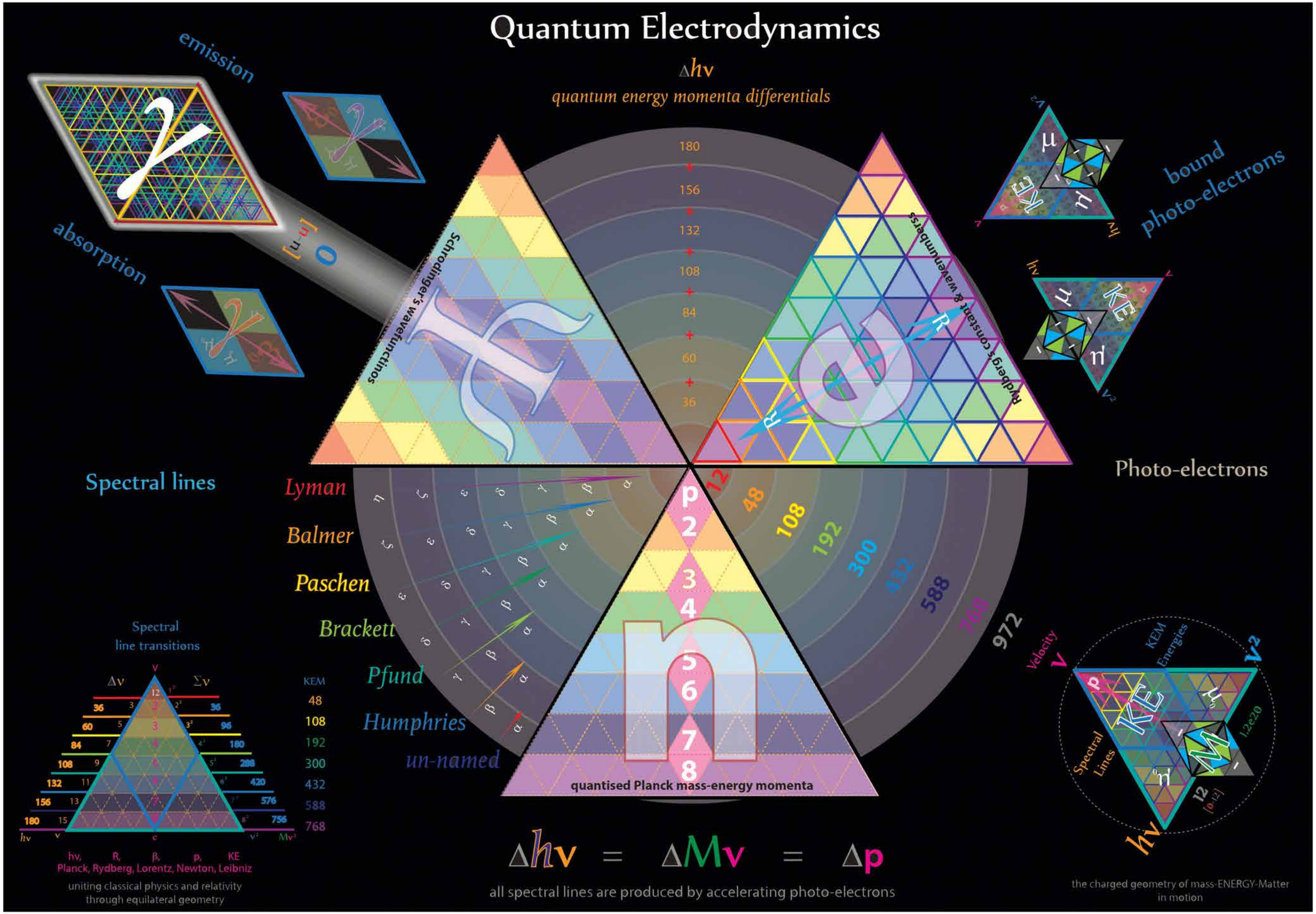
.0047

λ	19,174.54158	nm
$\tilde{\nu}$	52,152.48541	m-1
f	1.563492179 x 10^{13}	Hz
E	0.064693658	eV
Ω	5,748.382952	m²/s

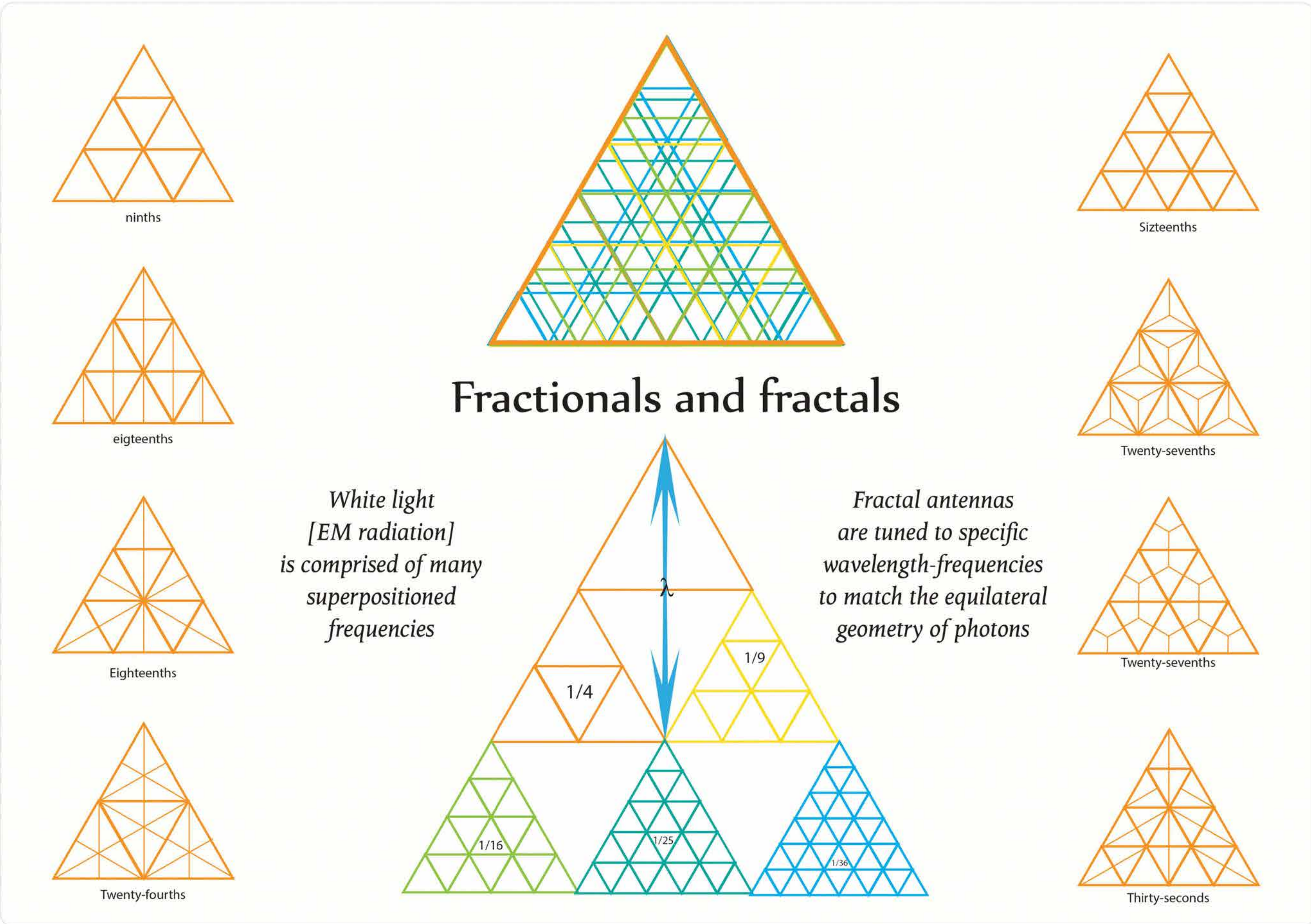
$R\left(\frac{1}{49} - \frac{1}{64}\right)$

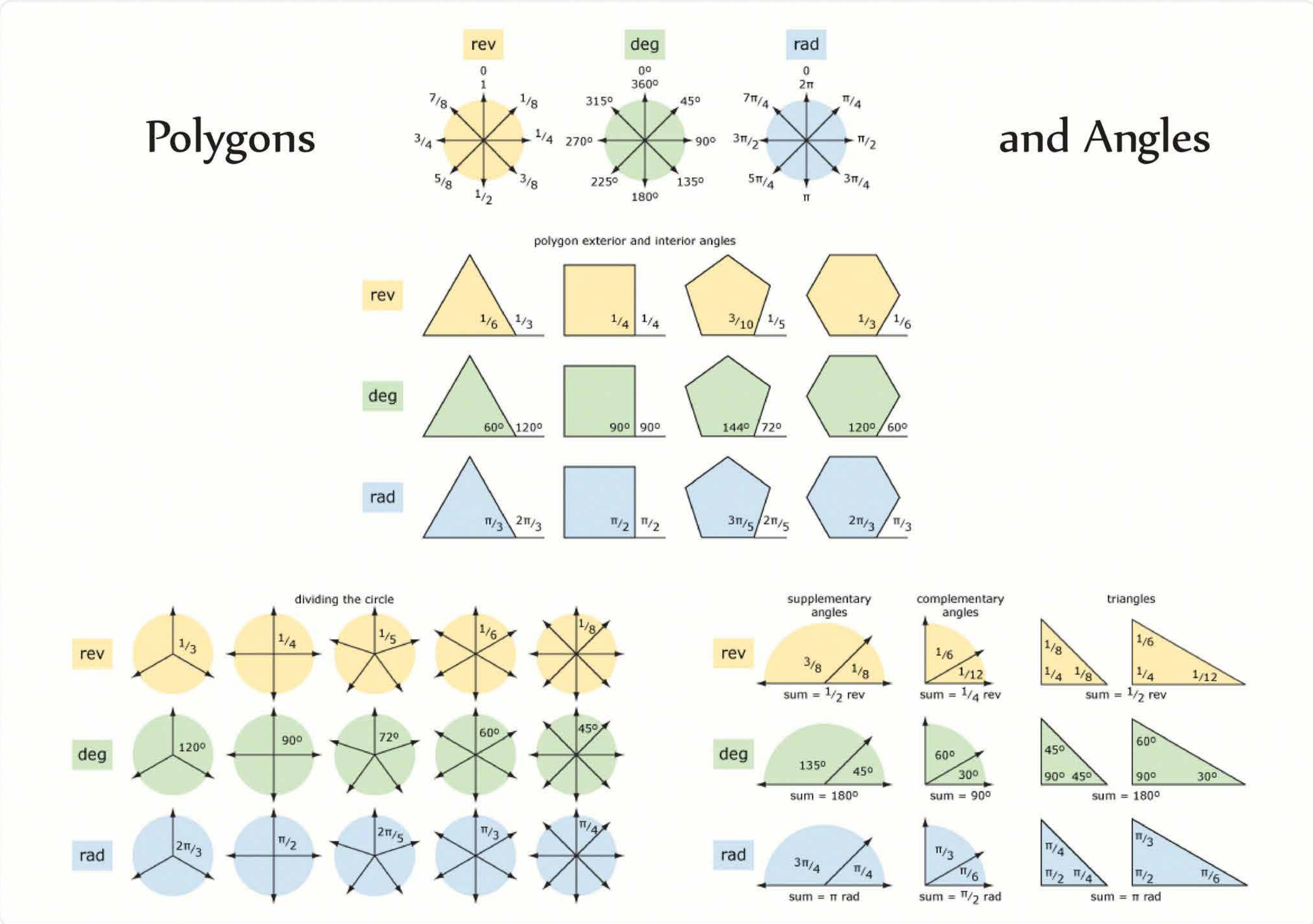
.0047

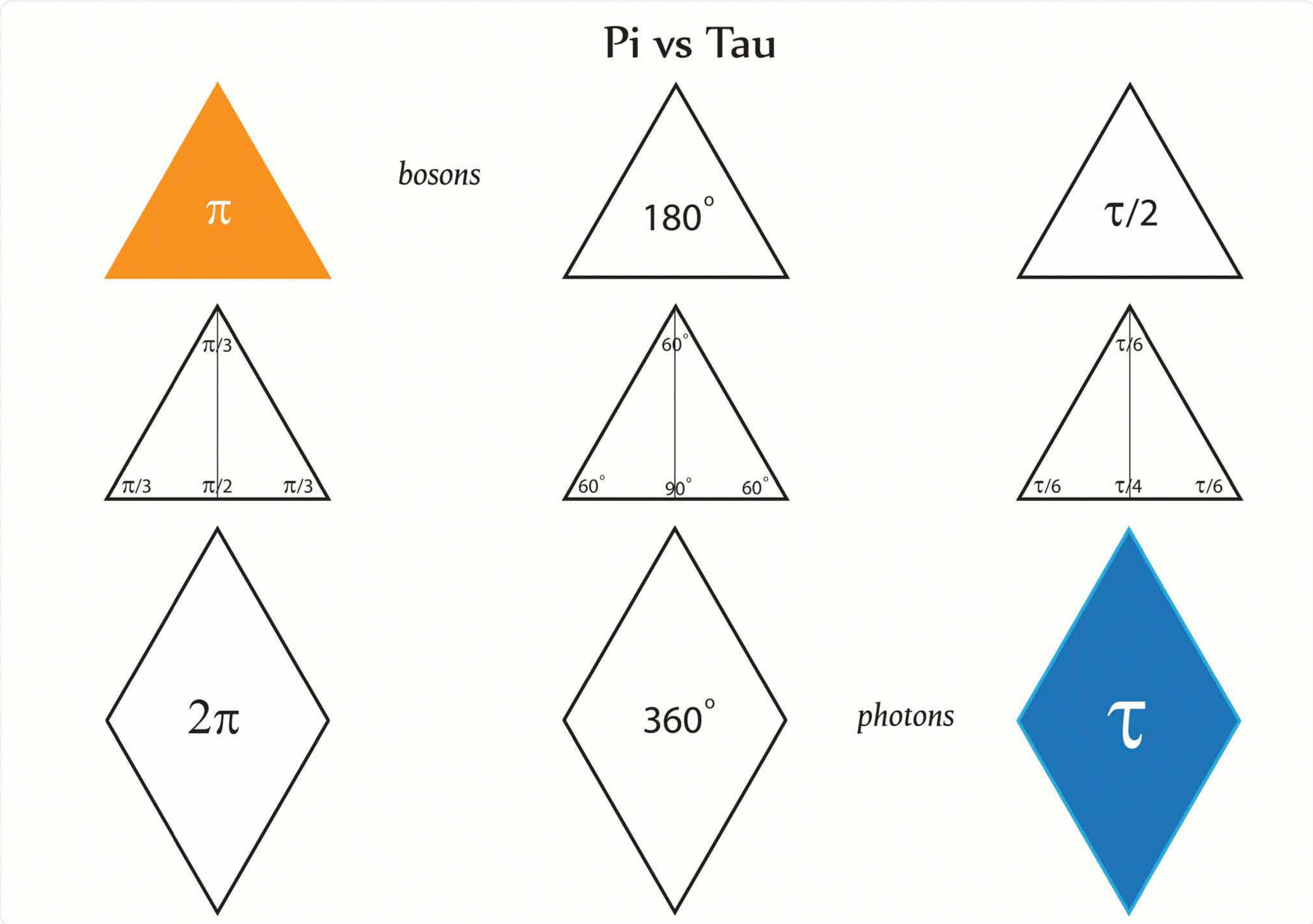
ΔMv^2



Tetryonics 96.11 - Atomic spectral series transitions

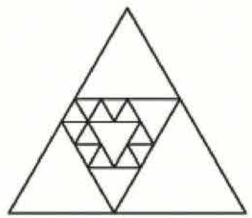

Fractionals and fractals
ninths
eigteenths
Eighteenths
Twenty-fourths
Sizteenths
Twenty-sevenths
Twenty-sevenths
Thirty-seconds
White light
[EM radiation]
is comprised of many
superpositioned
frequencies
Fractal antennas
are tuned to specific
wavelength-frequencies
to match the equilateral
geometry of photons
λ
1/4
1/9
1/16
1/25
1/36

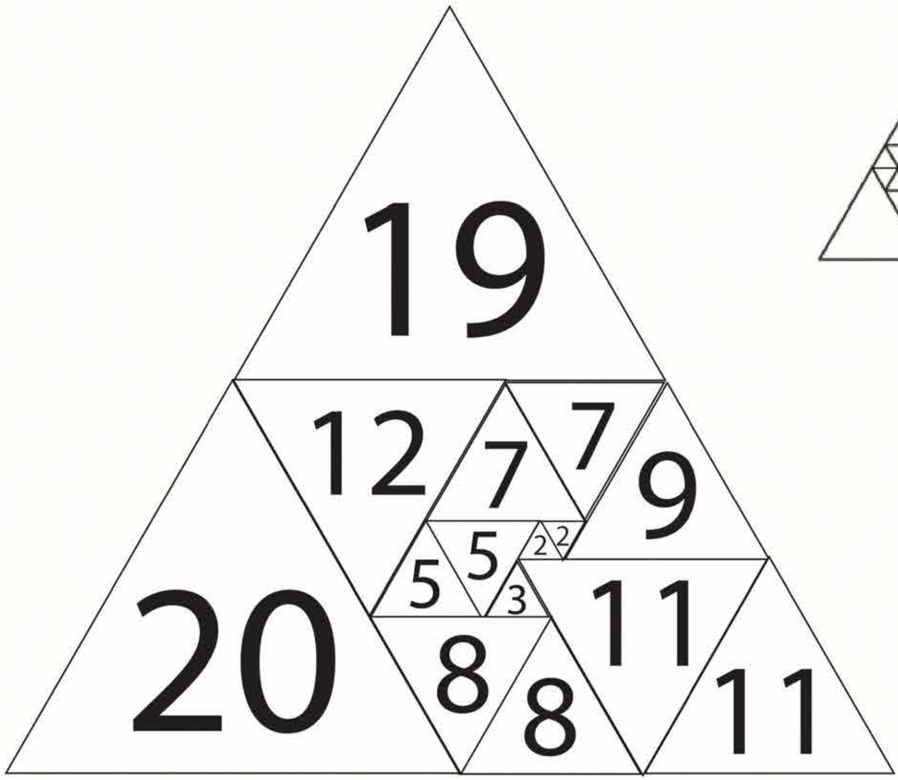

Polygons
and Angles
rev
deg
rad
0
1
1/8
1/4
3/8
1/2
5/8
3/4
7/8
0°
360°
45°
90°
135°
180°
225°
270°
315°
0
2π
π/4
π/2
3π/4
π
5π/4
3π/2
7π/4
polygon exterior and interior angles
rev
1/6 1/3
1/4 1/4
3/10 1/5
1/3 1/6
deg
60° 120°
90° 90°
144° 72°
120° 60°
rad
π/3 2π/3
π/2 π/2
3π/5 2π/5
2π/3 π/3
dividing the circle
rev
1/3 1/4 1/5 1/6 1/8
deg
120° 90° 72° 60° 45°
rad
2π/3 π/2 2π/5 π/3 π/4
supplementary angles
complementary angles
triangles
rev
3/8 1/8
sum = 1/2 rev
1/6 1/12
sum = 1/4 rev
1/8 1/4 1/8
1/6 1/4 1/12
sum = 1/2 rev
deg
135° 45°
sum = 180°
60° 30°
sum = 90°
45° 90° 45°
60° 90° 30°
sum = 180°
rad
3π/4 π/4
sum = π rad
π/3 π/6
sum = π/2 rad
π/4 π/2 π/4
π/3 π/2 π/6
sum = π rad


Pi vs Tau
π
bosons
180°
τ/2
π/3
π/3
π/2
π/3
60°
60°
90°
60°
τ/6
τ/6
τ/4
τ/6
2π
360°
photons
τ

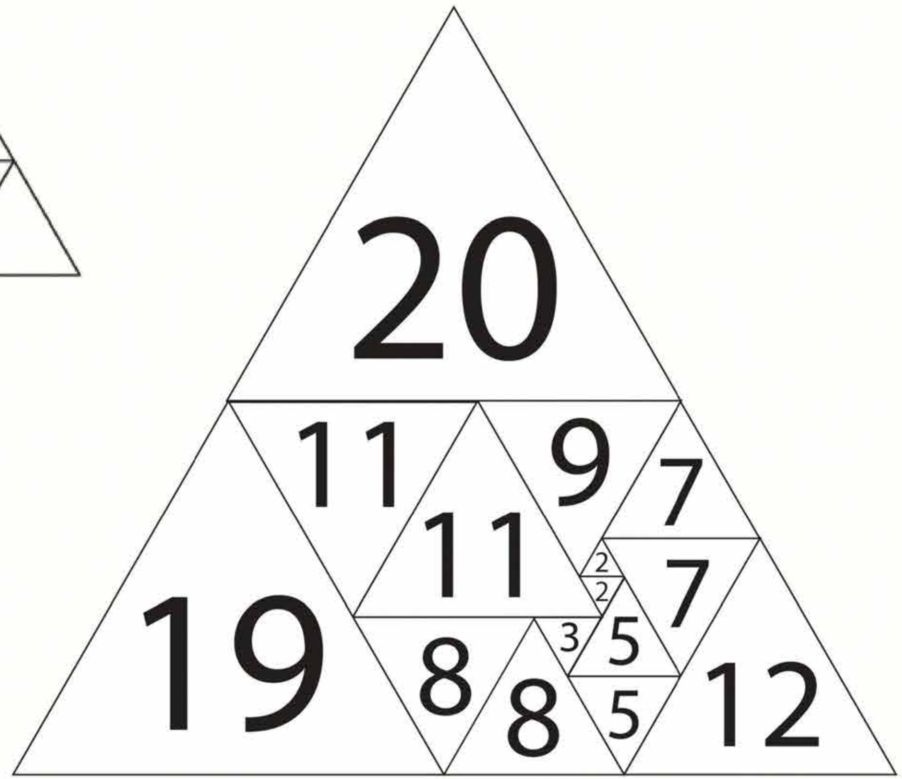
Triangular dissection of an equilateral triangle

is a way of dividing up a original triangle into smaller equilateral triangles,
such that none of the smaller triangles overlap





lowest order perfect equilateral triangle dissected by equilateral triangles

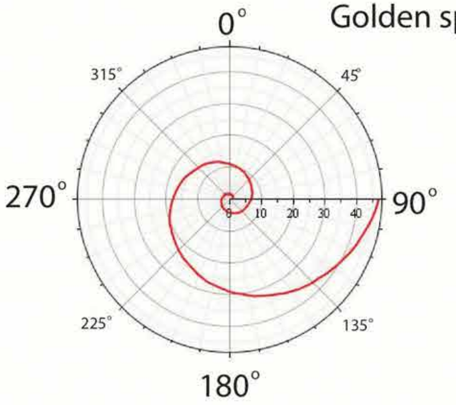


lowest order perfect dissected equilateral triangle, an isomer of the first

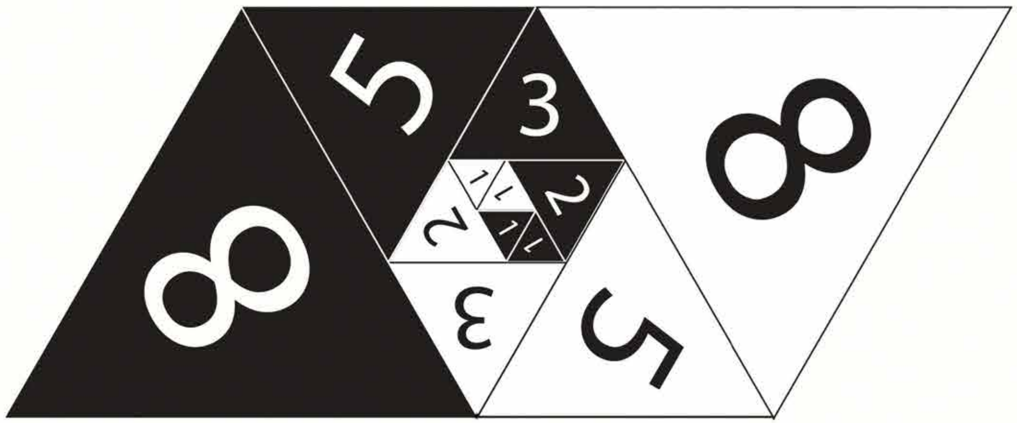
Golden mean Spirals

Golden Mean Spiral – This spiral is derived via the golden rectangle, a unique rectangle which has the golden ratio.
This form is found everywhere in nature: the Nautilus Shell, the face of a Sunflower, fingerprints, our DNA, and the shape of the Milky Way

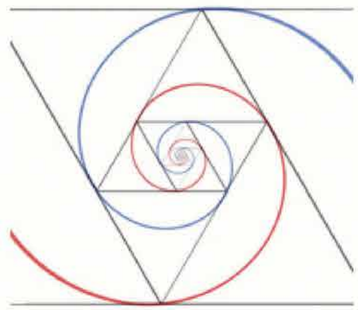
Golden spiral

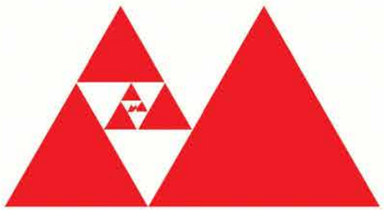


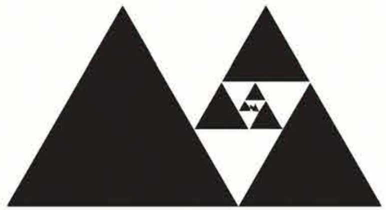
$0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, \ldots$



Golden spirals







Continued fractions and the Fibonacci sequence

The convergence of the continued fractions

$$1 + \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \frac{1}{1+} \ldots$$

are:

$$\frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, \frac{55}{34}, \frac{89}{55}, \frac{144}{89}, \frac{233}{144}, \frac{377}{233}, \frac{610}{377},$$

The Golden Ratio (Golden Mean, Golden Section)
is defined mathematically as:

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.6180339887\ldots.$$

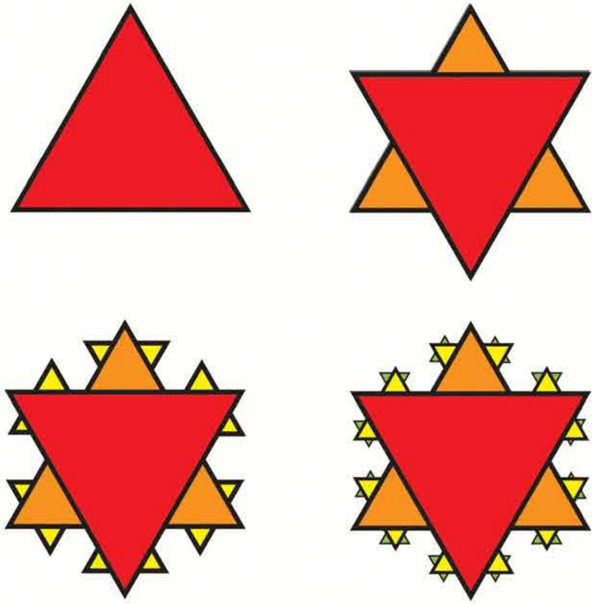
Koch fractal Curve

Niels Fabian Helge von Koch (January 25, 1870 – March 11, 1924) was a Swedish mathematician who gave his name to one of the earliest fractal curves ever known

He described the Koch curve, or Koch snowflakes as it popularly known, in a 1904 paper entitled "On a continuous curve without tangents constructible from elementary geometry"

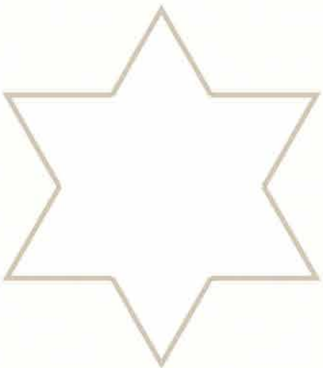
Von Koch wrote several papers on number theory . One of his results was a 1901 theorem proving that the Riemann hypothesis is equivalent to a strengthened form of the prime number theorem.

Three Koch curves form the snowflake.



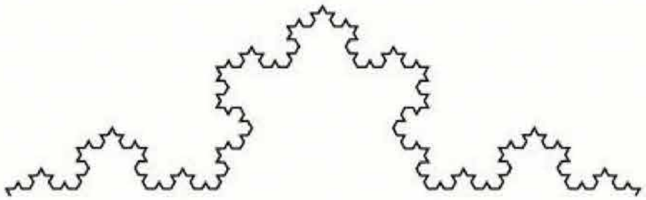
The Koch snowflake (or Koch star) is a mathematical curve and one of the earliest fractal curves to have been described.

Actually Koch described what is now known as the Koch curve, which is the same as the now popular snowflake, except it starts with a line segment instead of an equilateral triangle.

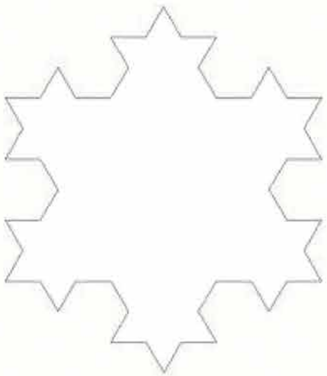


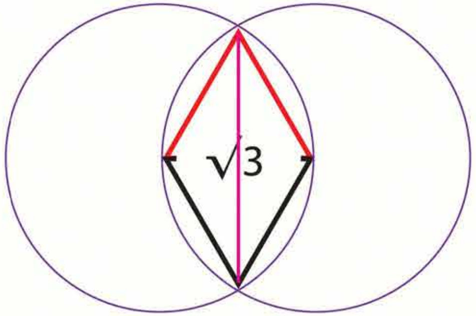
$$a = \frac{1}{2} + \frac{i}{\sqrt{12}}$$

The Koch curve is a special case of the Cesaro curve where:



which is in turn a special case of the de Rham curve.

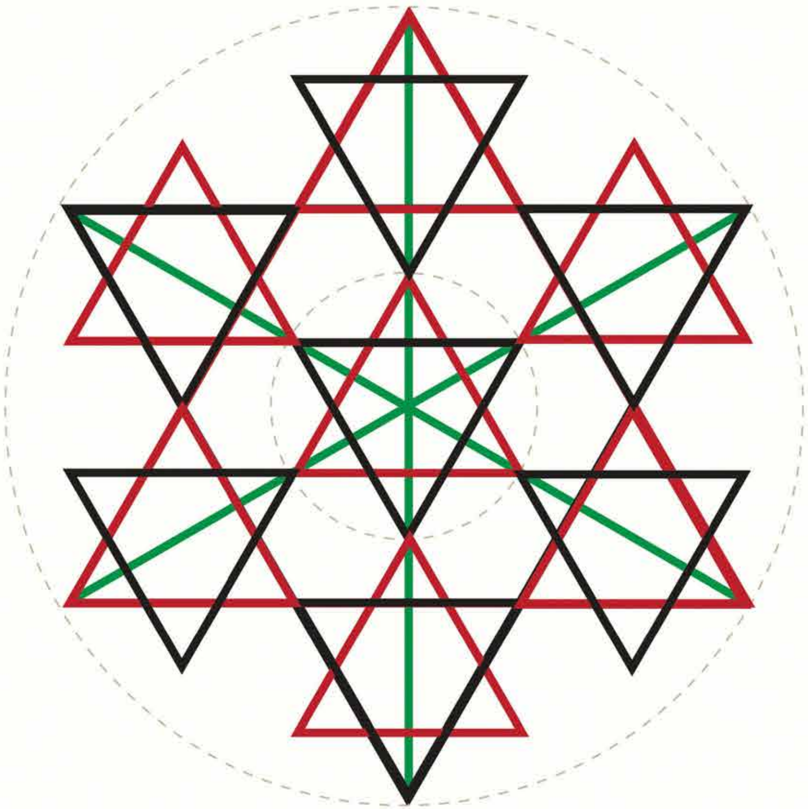




vesica piscis

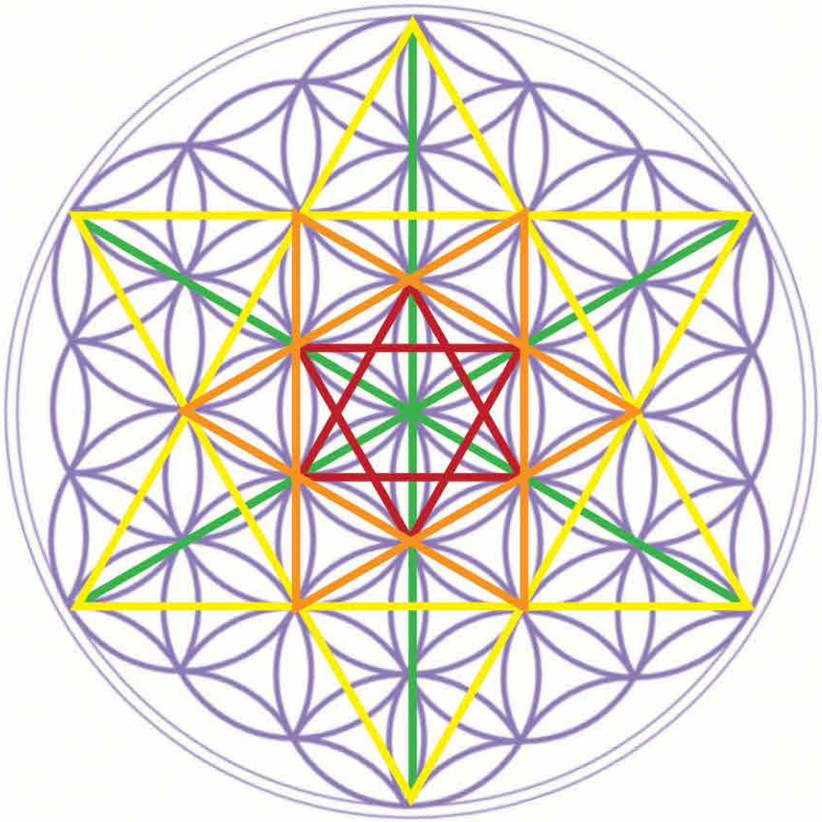
$$\frac{1351}{780} > \sqrt{3} > \frac{265}{153}.$$

Koch snowflake



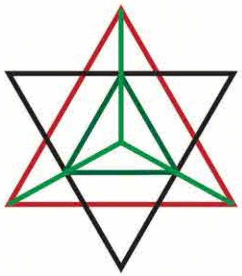
space-time

Flower of Life

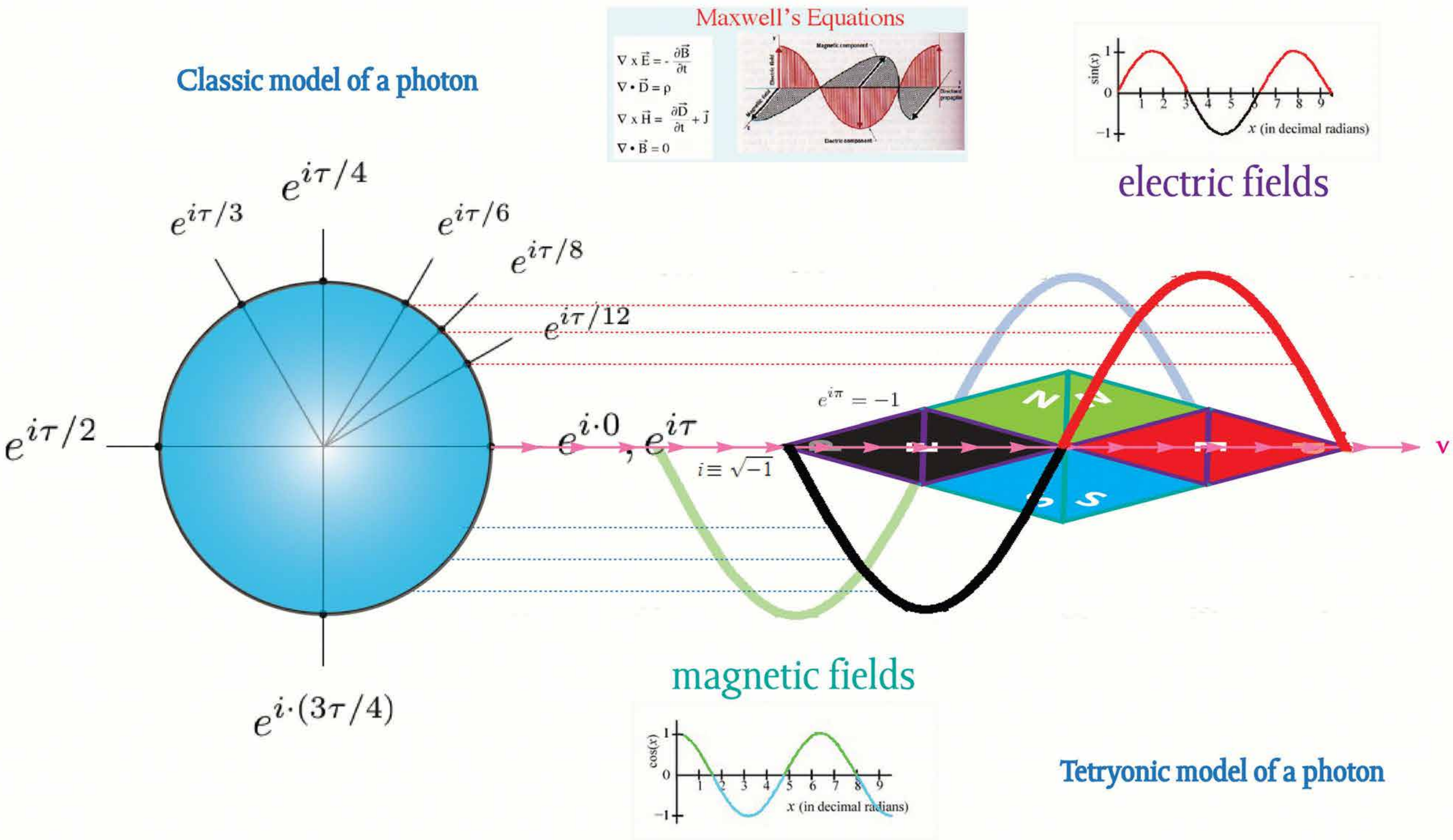


The Flower of Life is a name for a geometrical figure composed of multiple evenly-spaced, overlapping circles.

star tetrahedron

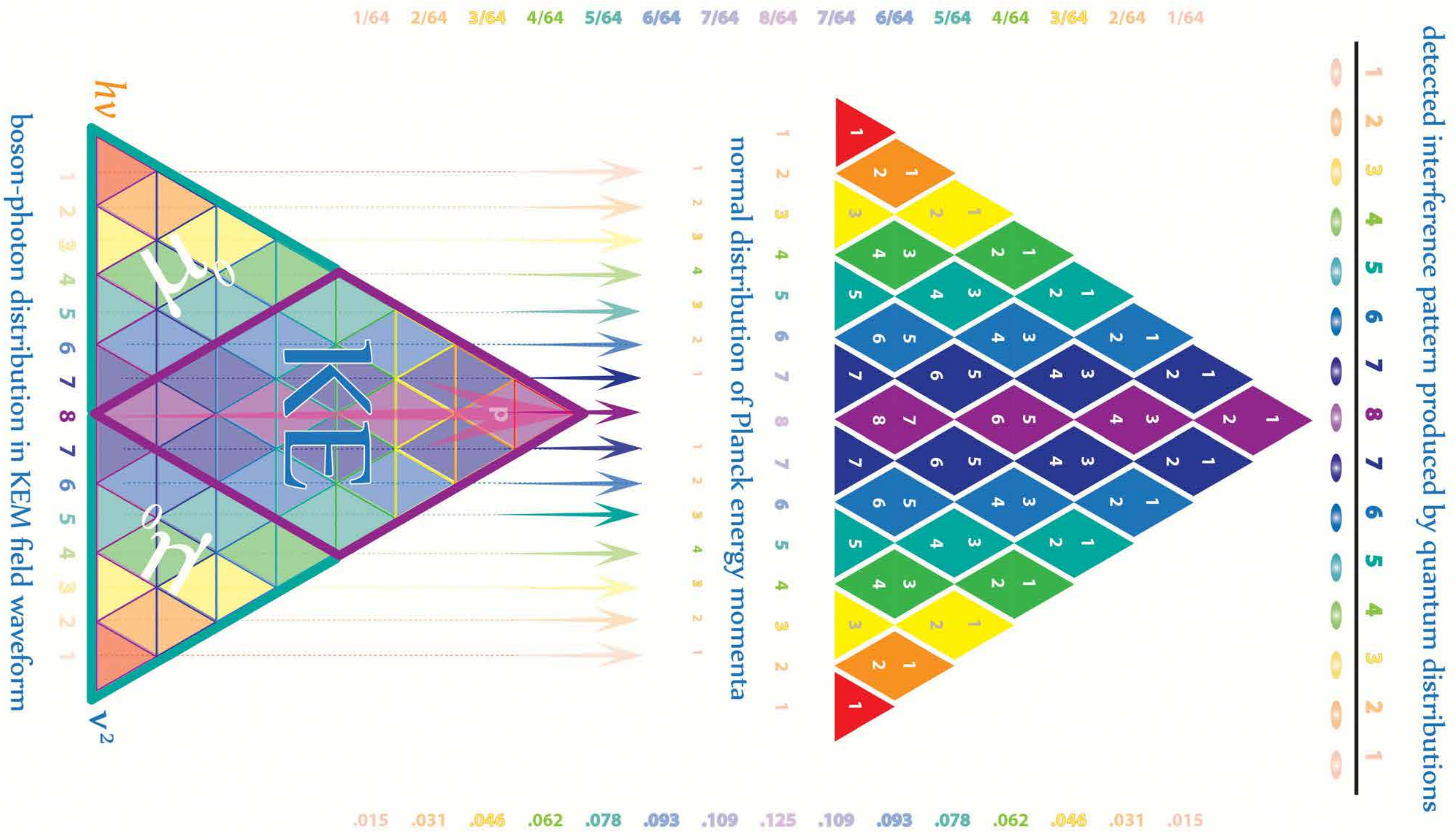


Unit circles - SINE WAVES - Photons



Magnetic waveforms are 90 degrees out of phase with Electric waveforms

Boson distributions in monochromatic EM waves

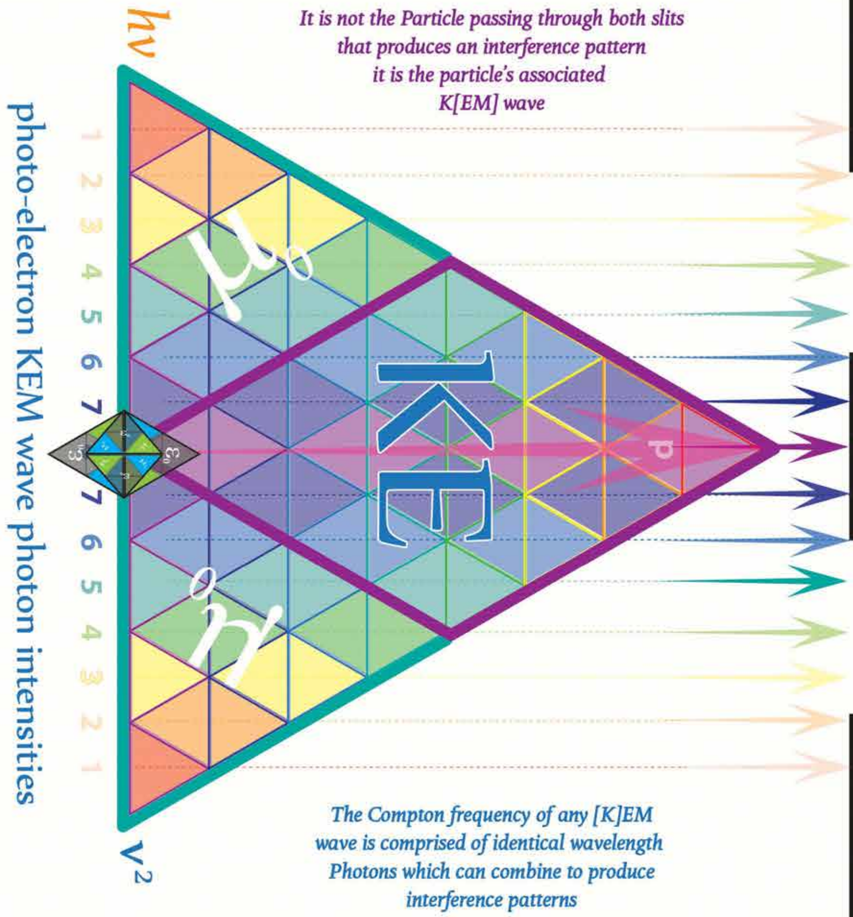


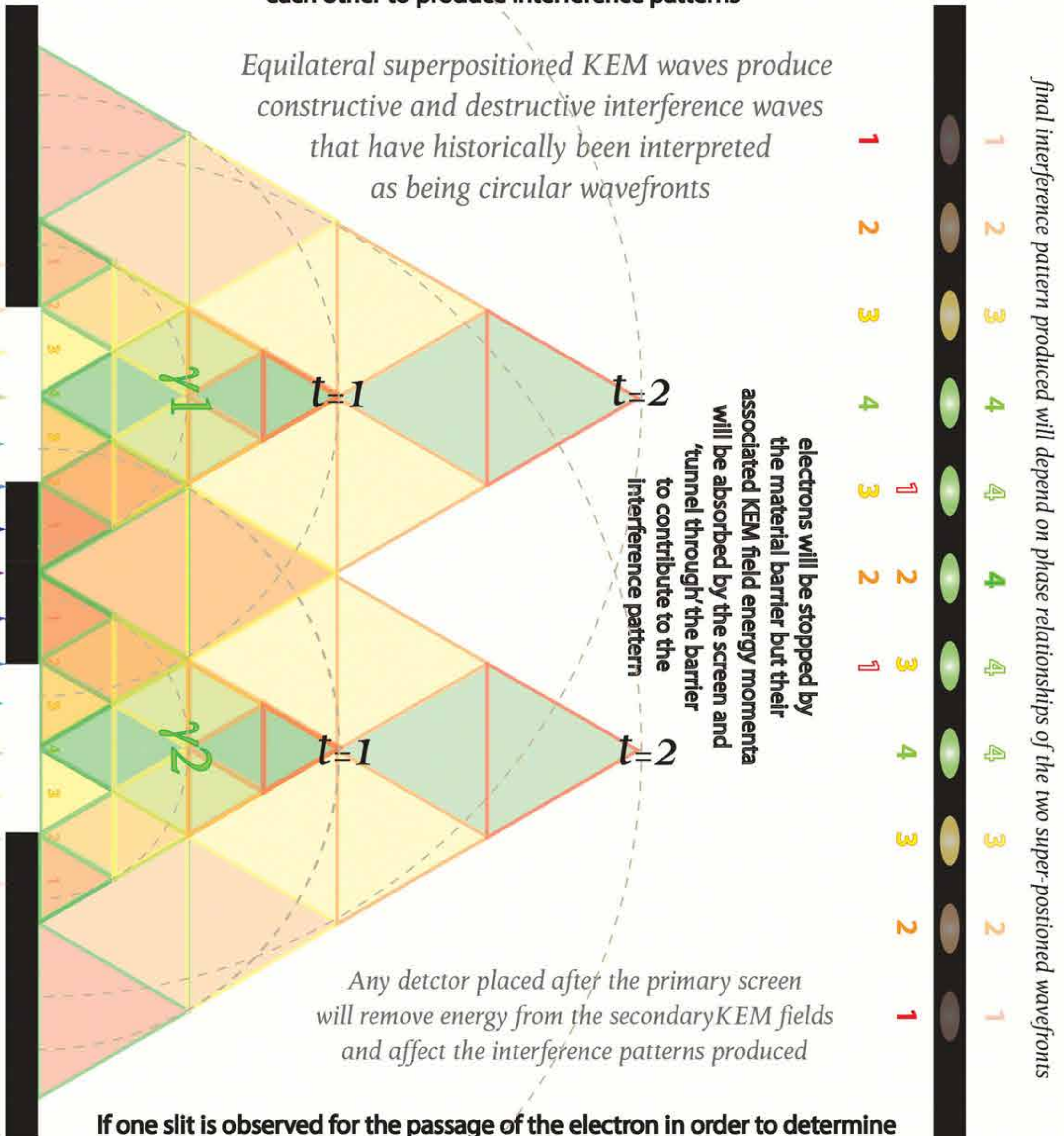
Probability distributions of monochromatic EM waves

Wave interference patterns

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 and Establishes the quantum interference principle known as wave–particle duality.

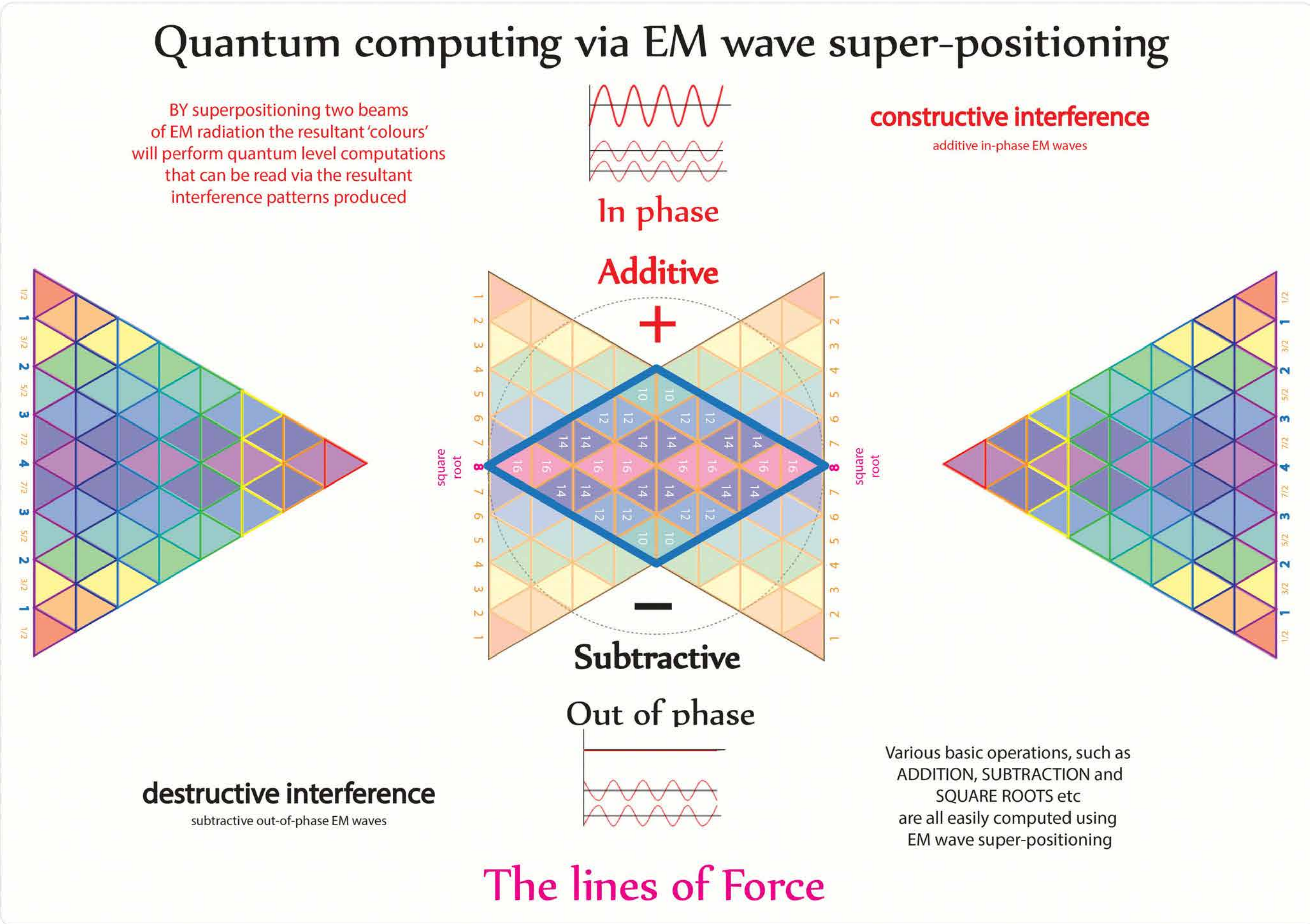
Matter particles are stopped by the barrier but the [K]EM wave passes through both slits and is diffracted by them producing weaker EM waves that then superposition with each other to produce interference patterns

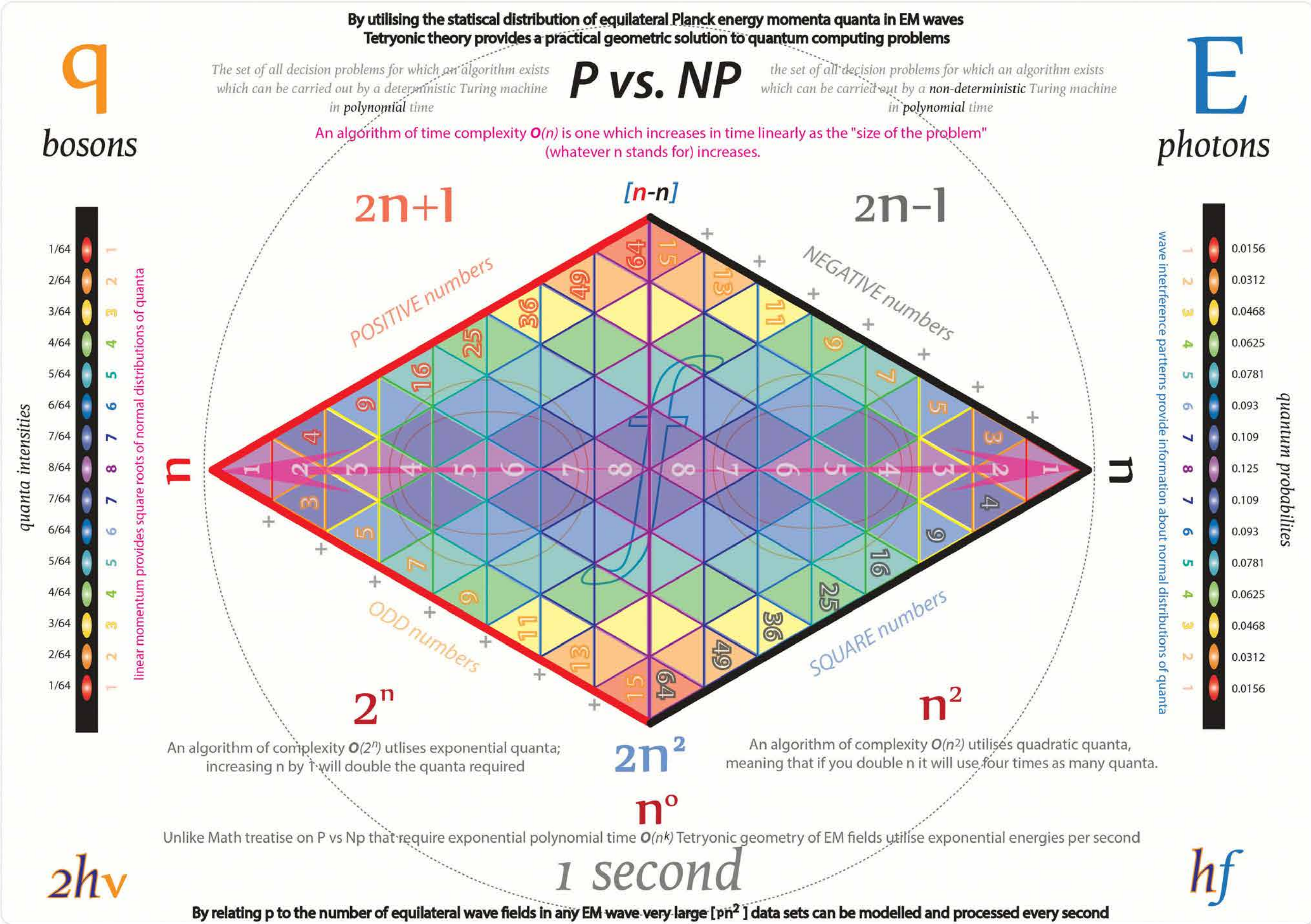




If one slit is observed for the passage of the electron in order to determine its physical state then the its KEM field wave will be absorbed by the detector resulting in only one wave remaining, enforcing a classical particle outcome

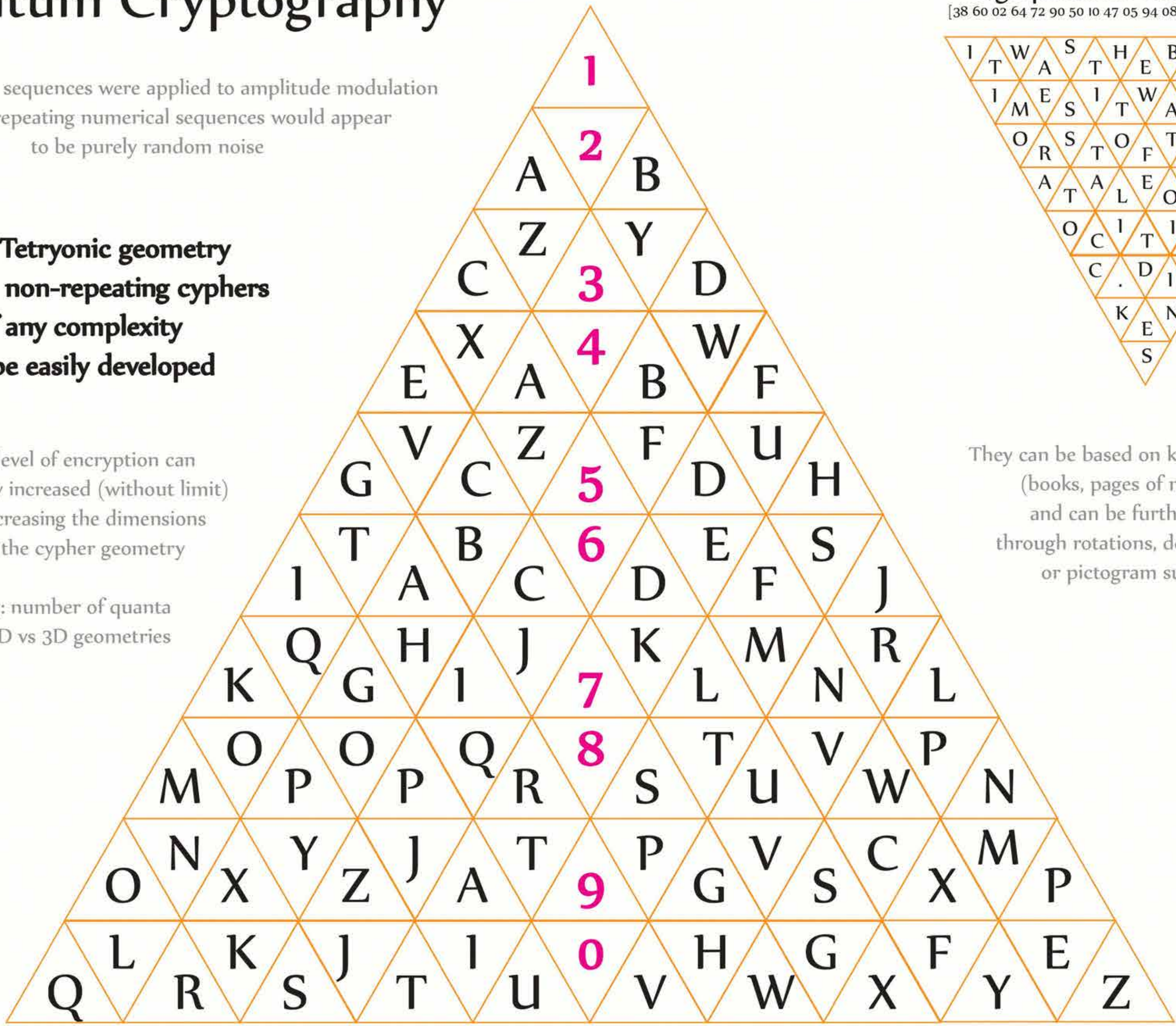
In the basic version of the experiment, a coherent light source such as a laser beam illuminates a thin plate pierced by two parallel slits, and the light passing through the slits is observed on a screen behind the plate. The wave nature of light causes the light waves passing through the two slits 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.


Quantum computing via EM wave super-positioning
BY superpositioning two beams of EM radiation the resultant 'colours' will perform quantum level computations that can be read via the resultant interference patterns produced
In phase
constructive interference
additive in-phase EM waves
Additive
+
square root
−
Subtractive
Out of phase
destructive interference
subtractive out-of-phase EM waves
Various basic operations, such as ADDITION, SUBTRACTION and SQUARE ROOTS etc are all easily computed using EM wave super-positioning
The lines of Force


By utilising the statiscal distribution of equilateral Planck energy momenta quanta in EM waves
Tetryonic theory provides a practical geometric solution to quantum computing problems
q
bosons
The set of all decision problems for which an algorithm exists which can be carried out by a deterministic Turing machine in polynomial time
P vs. NP
the set of all decision problems for which an algorithm exists which can be carried out by a non-deterministic Turing machine in polynomial time
E
photons
An algorithm of time complexity O(n) is one which increases in time linearly as the "size of the problem" (whatever n stands for) increases.
2n+1
[n-n]
2n-1
POSITIVE numbers
NEGATIVE numbers
ODD numbers
SQUARE numbers
quanta intensities
1/64
2/64
3/64
4/64
5/64
6/64
7/64
8/64
7/64
6/64
5/64
4/64
3/64
2/64
1/64
linear momentum provides square roots of normal distributions of quanta
n
n
wave interference parterns provide information about normal distributions of quanta
quantum probabilities
0.0156
0.0312
0.0468
0.0625
0.0781
0.093
0.109
0.125
0.109
0.093
0.0781
0.0625
0.0468
0.0312
0.0156
2ⁿ
2n²
n²
An algorithm of complexity O(2ⁿ) utlises exponential quanta; increasing n by 1 will double the quanta required
An algorithm of complexity O(n2) utilises quadratic quanta, meaning that if you double n it will use four times as many quanta.
nº
Unlike Math treatise on P vs Np that require exponential polynomial time O(nᵏ) Tetryonic geometry of EM fields utilise exponential energies per second
2hv
1 second
hf
By relating p to the number of equilateral wave fields in any EM wave very large [pn²] data sets can be modelled and processed every second

Quantum Cryptography

If the numerical sequences were applied to amplitude modulation
their non-repeating numerical sequences would appear
to be purely random noise



eg: quantum encryption 1024
[38 60 02 64 72 90 50 10 47 05 94 08 48 52 27 26 51 66 01 91 03 20]

**Using Tetryonic geometry
advanced non-repeating cyphers
of any complexity
can be easily developed**

The level of encryption can
be easily increased (without limit)
by increasing the dimensions
of the cypher geometry

eg: number of quanta
2D vs 3D geometries

They can be based on known letter sources
(books, pages of magazines etc)
and can be further encrypted
through rotations, double encrypting
or pictogram substitutions

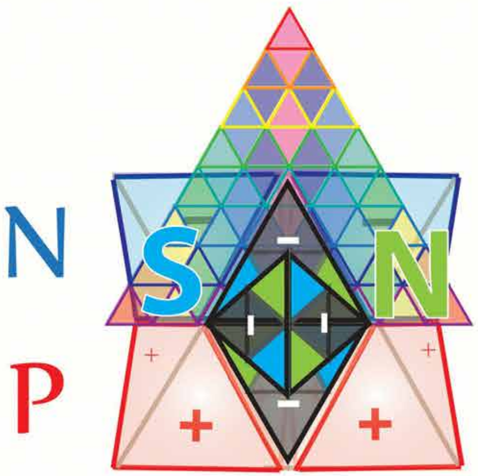
Quantum Computing

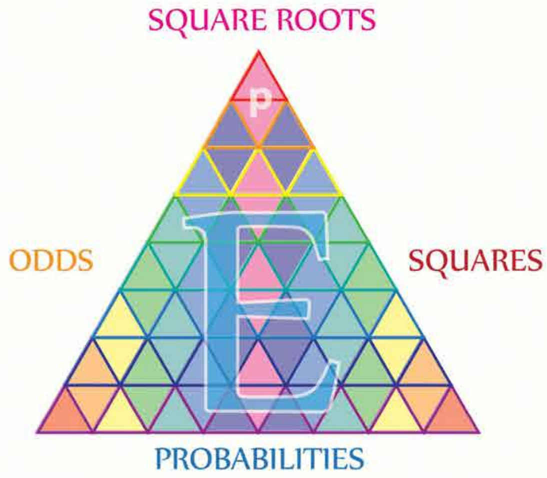
The Proton/Neutron geometries of atomic nuclei can be built at the quantum scale
to create an atomic nuclei that can operate as a Opto-memory-transistive computing element,
many elements can then be combined in lattices to create super computers no larger than bacterium

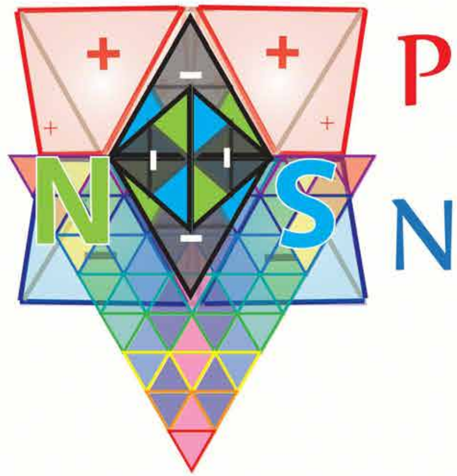
Spin UP

*Energy can be gated through individual nuclei
using the centre Baryon as the base transistor element,
in turn effecting the energies of bound photo-electrons*

Spin DOWN





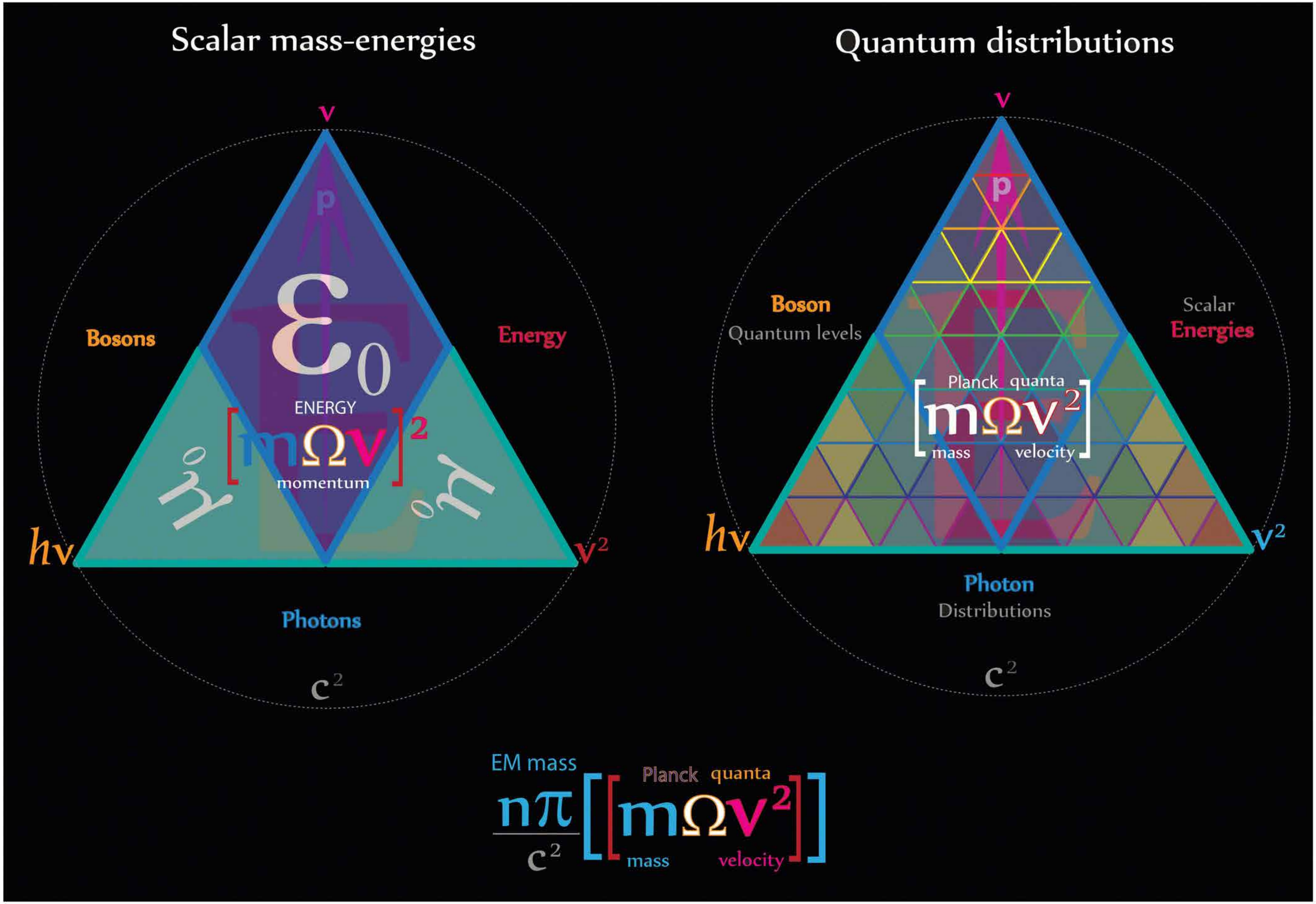


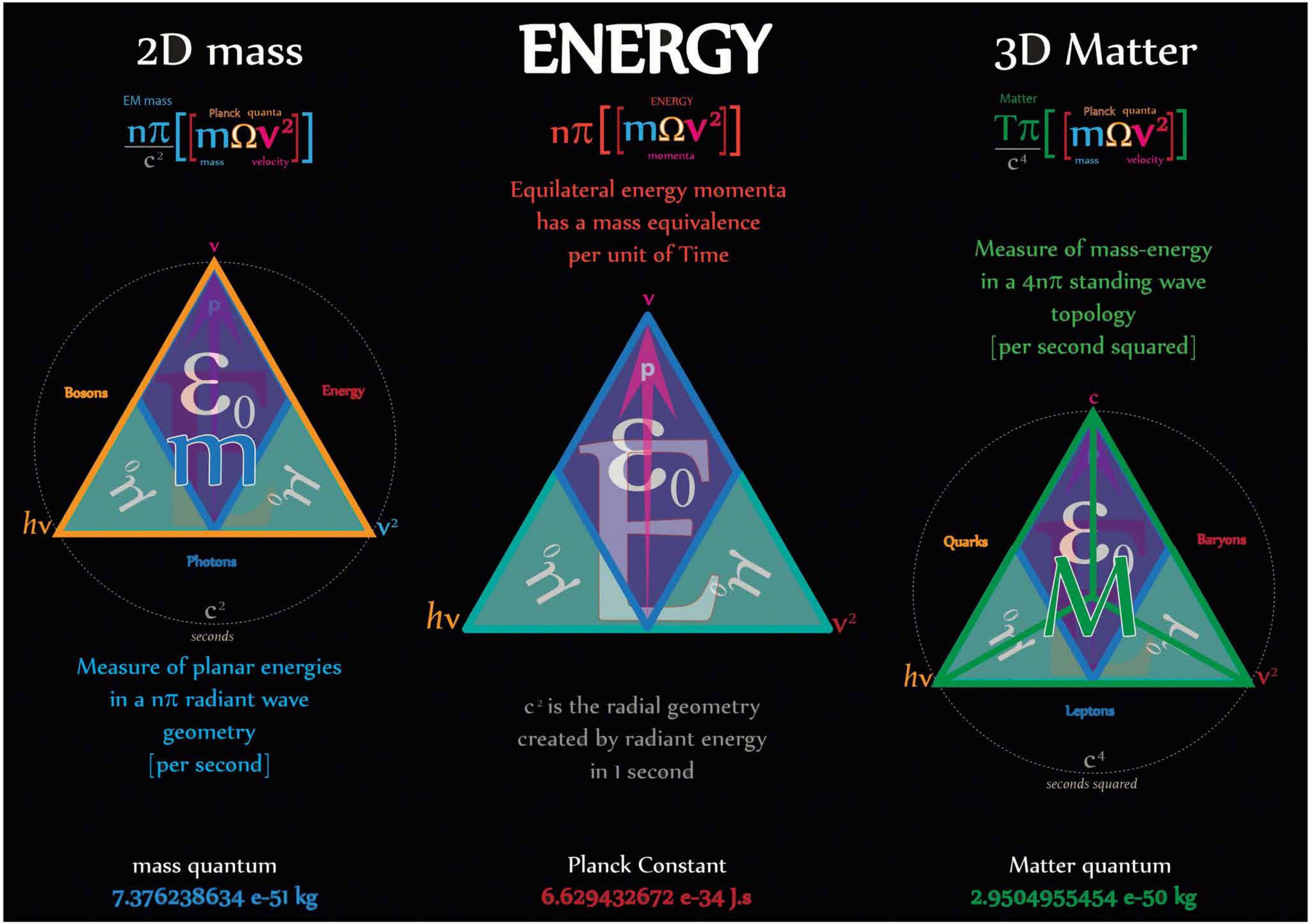
Q-bits

1

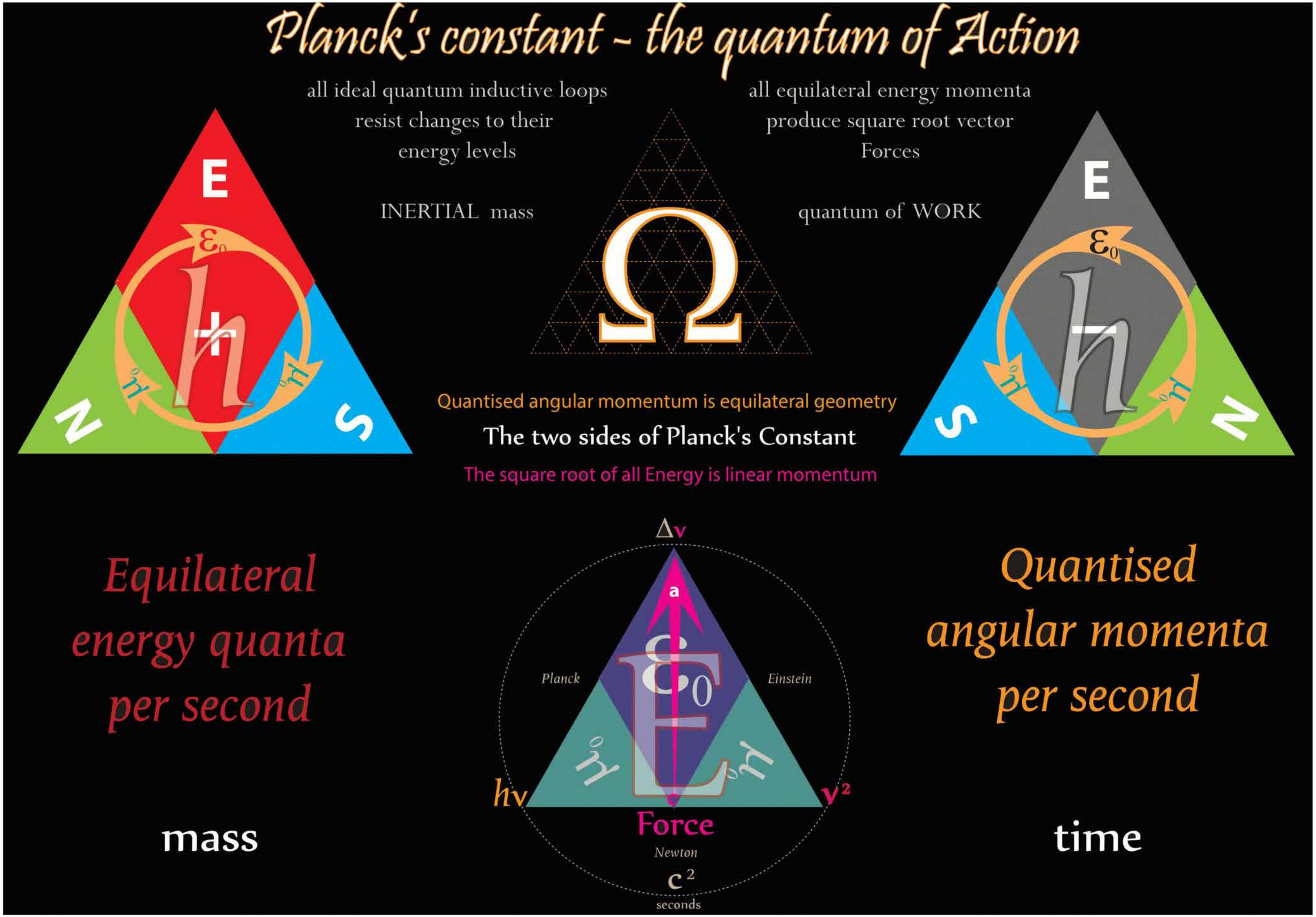
*photo-electronic transitions can be used to directly recieve
or emit memory states through the absorption and emission
of spectral photons of specific energy momenta*

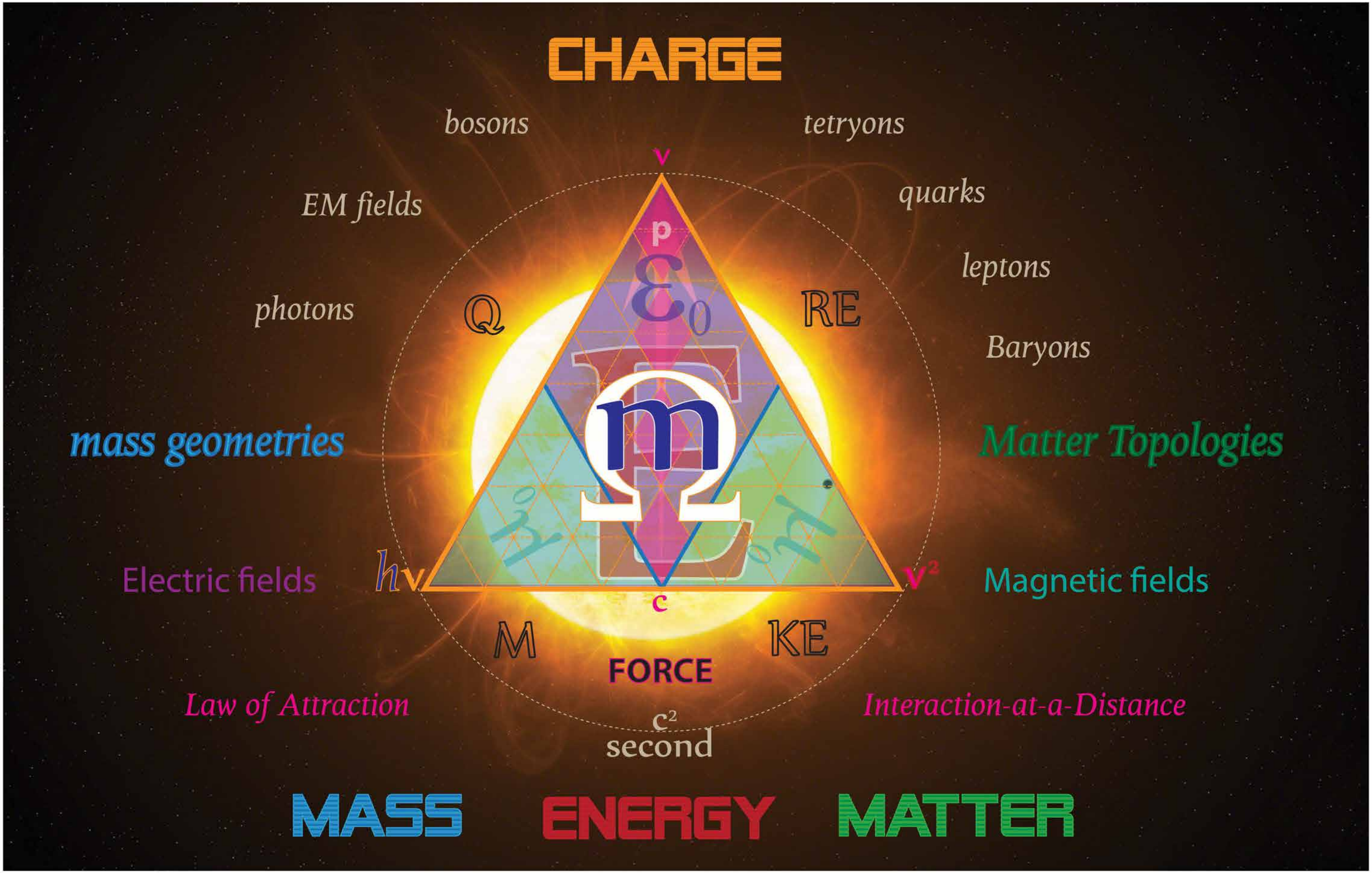
0


Scalar mass-energies
v
p
ε0
ENERGY
[mΩv]2
momentum
Bosons
Energy
hv
v2
Photons
c2
Quantum distributions
v
p
Boson
Quantum levels
Scalar
Energies
Planck quanta
[mΩv2]
mass velocity
hv
v2
Photon
Distributions
c2
EM mass
Planck quanta
nπ/c2 [[mΩv2]]
mass velocity

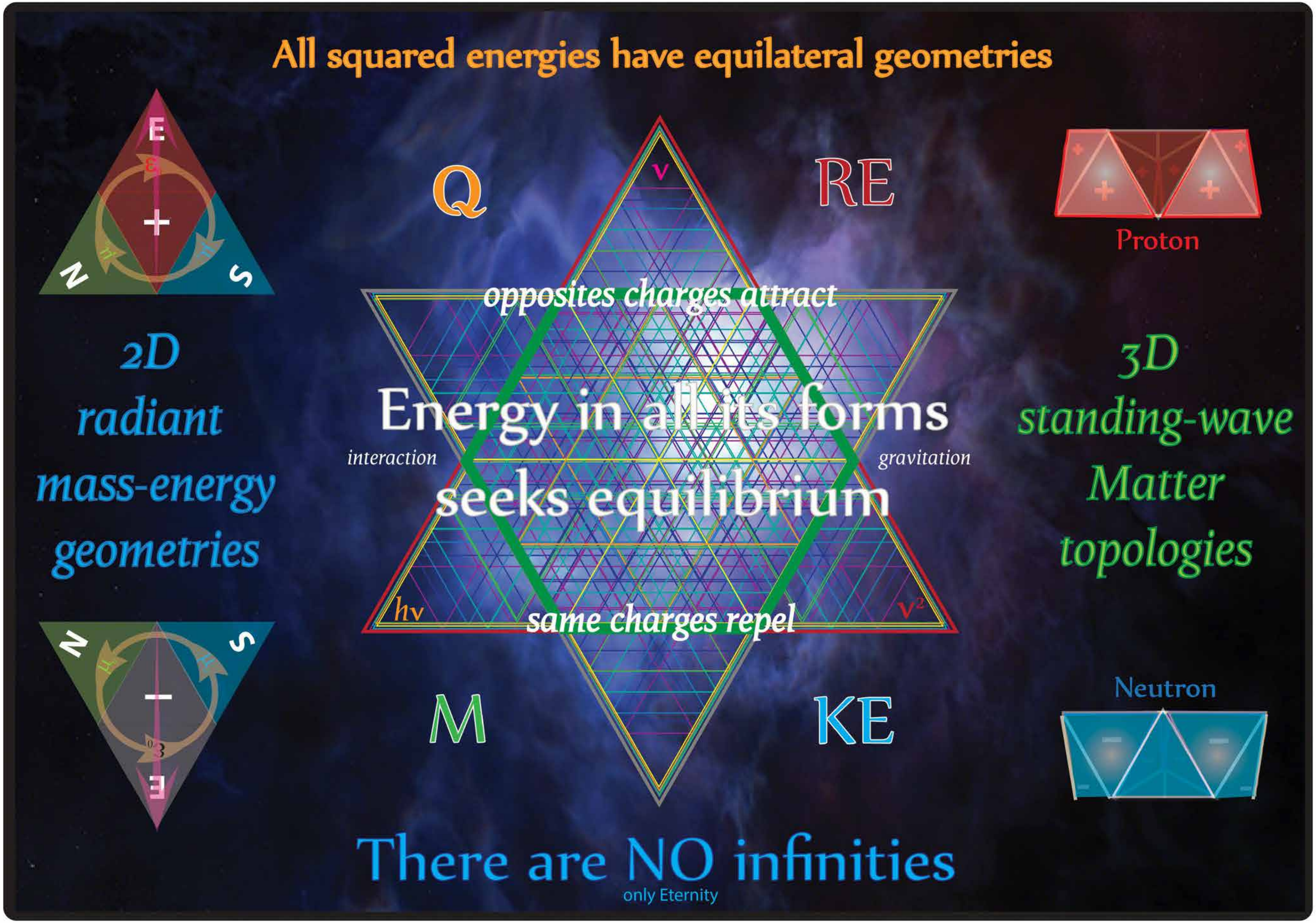


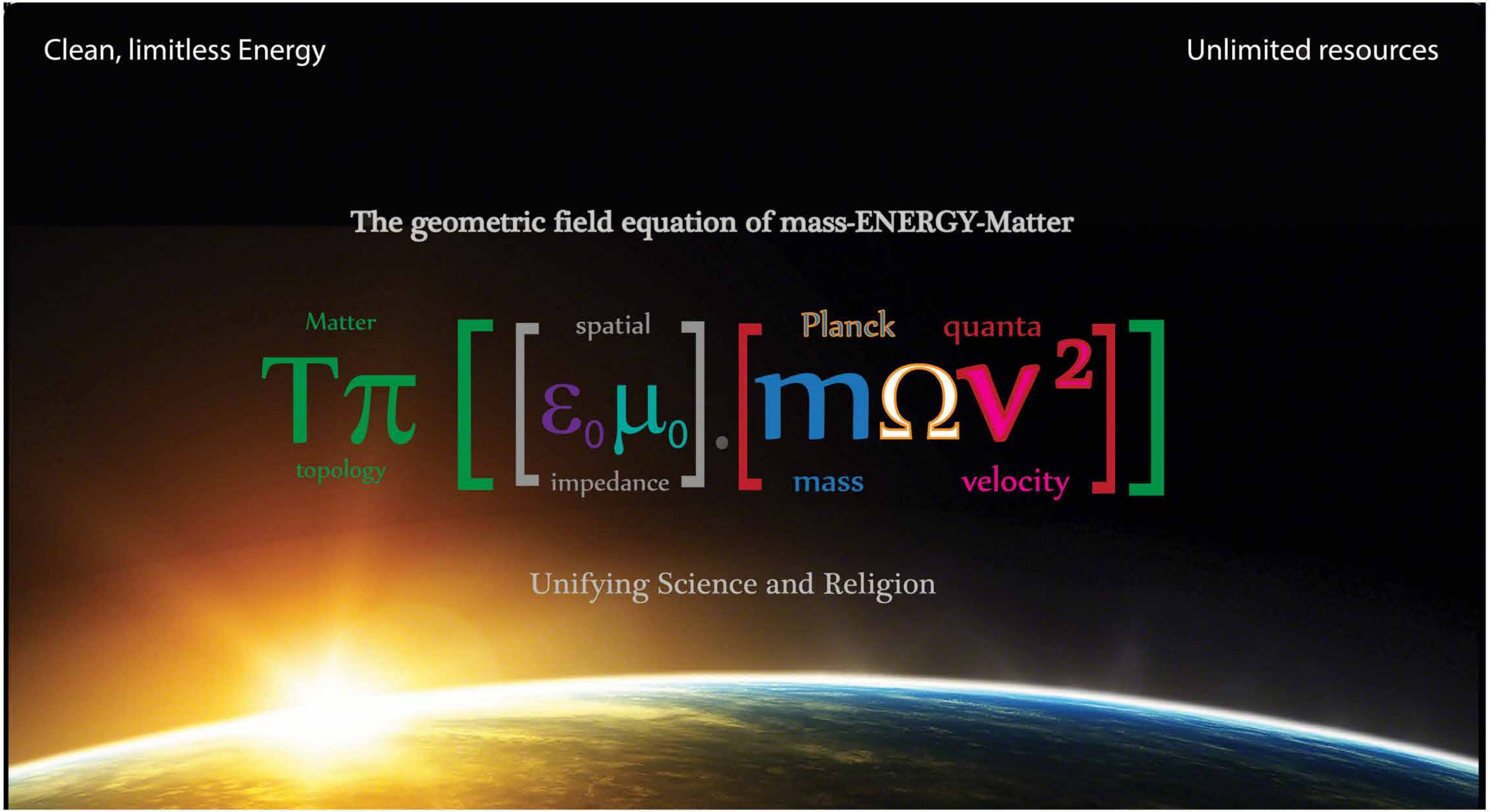
2D mass
EM mass
Planck quanta
$\frac{n\pi}{c^2}[[m\Omega v^2]]$
mass velocity
Bosons
Energy
Photons
v
hv
v²
c²
seconds
Measure of planar energies
in a nπ radiant wave
geometry
[per second]
mass quantum
7.376238634 e-51 kg
ENERGY
ENERGY
$n\pi[[m\Omega v^2]]$
momenta
Equilateral energy momenta
has a mass equivalence
per unit of Time
c² is the radial geometry
created by radiant energy
in 1 second
Planck Constant
6.629432672 e-34 J.s
3D Matter
Matter
Planck quanta
$\frac{T\pi}{c^4}[[m\Omega v^2]]$
mass velocity
Measure of mass-energy
in a 4nπ standing wave
topology
[per second squared]
Quarks
Baryons
Leptons
c⁴
seconds squared
Matter quantum
2.9504955454 e-50 kg

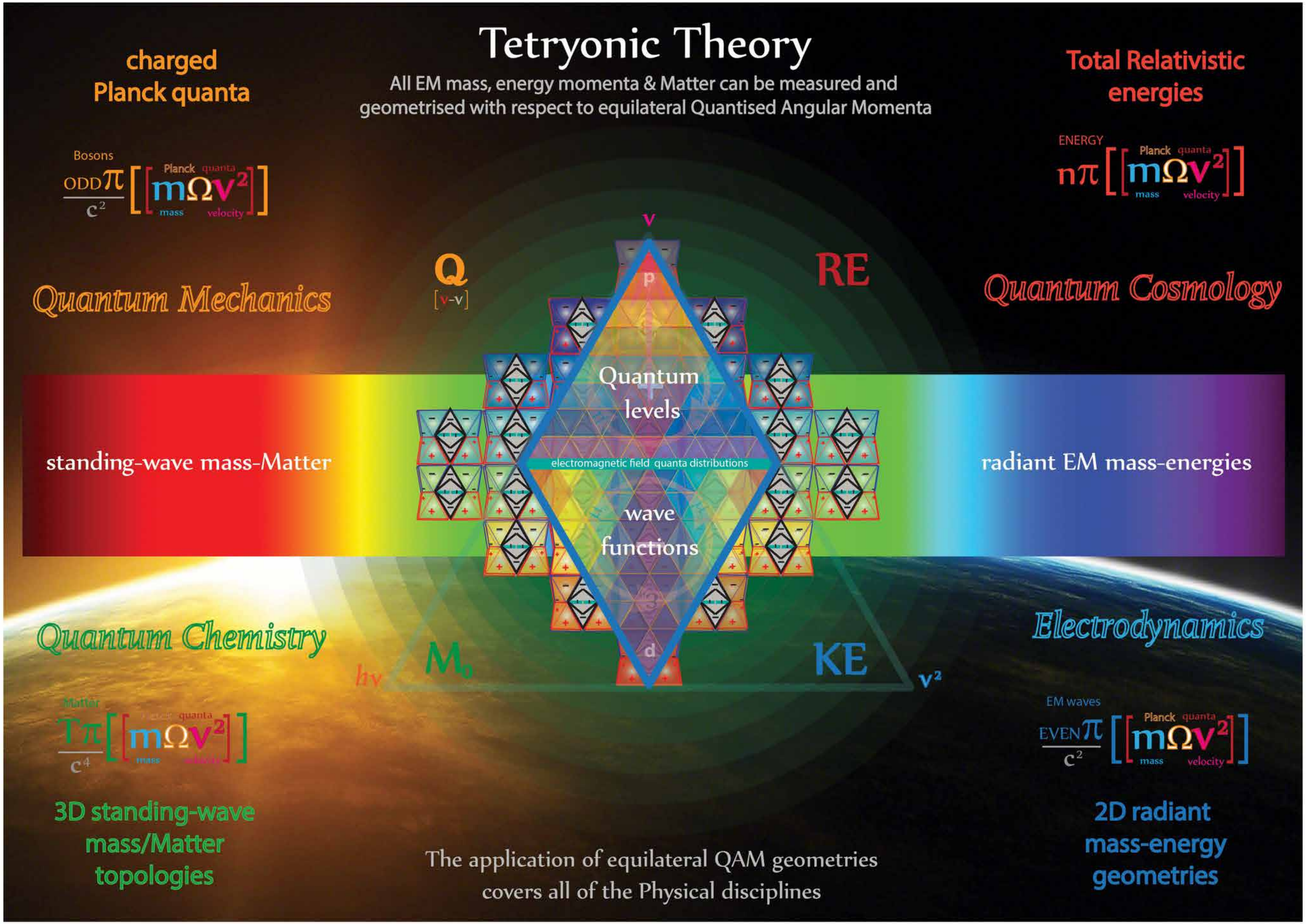

Planck's constant - the quantum of Action
all ideal quantum inductive loops
resist changes to their
energy levels
INERTIAL mass
all equilateral energy momenta
produce square root vector
Forces
quantum of WORK
Ω
E
N
S
Quantised angular momentum is equilateral geometry
The two sides of Planck's Constant
The square root of all Energy is linear momentum
Δv
a
Planck
Einstein
hv
v²
Force
Newton
c 2
seconds
Equilateral
energy quanta
per second
mass
Quantised
angular momenta
per second
time



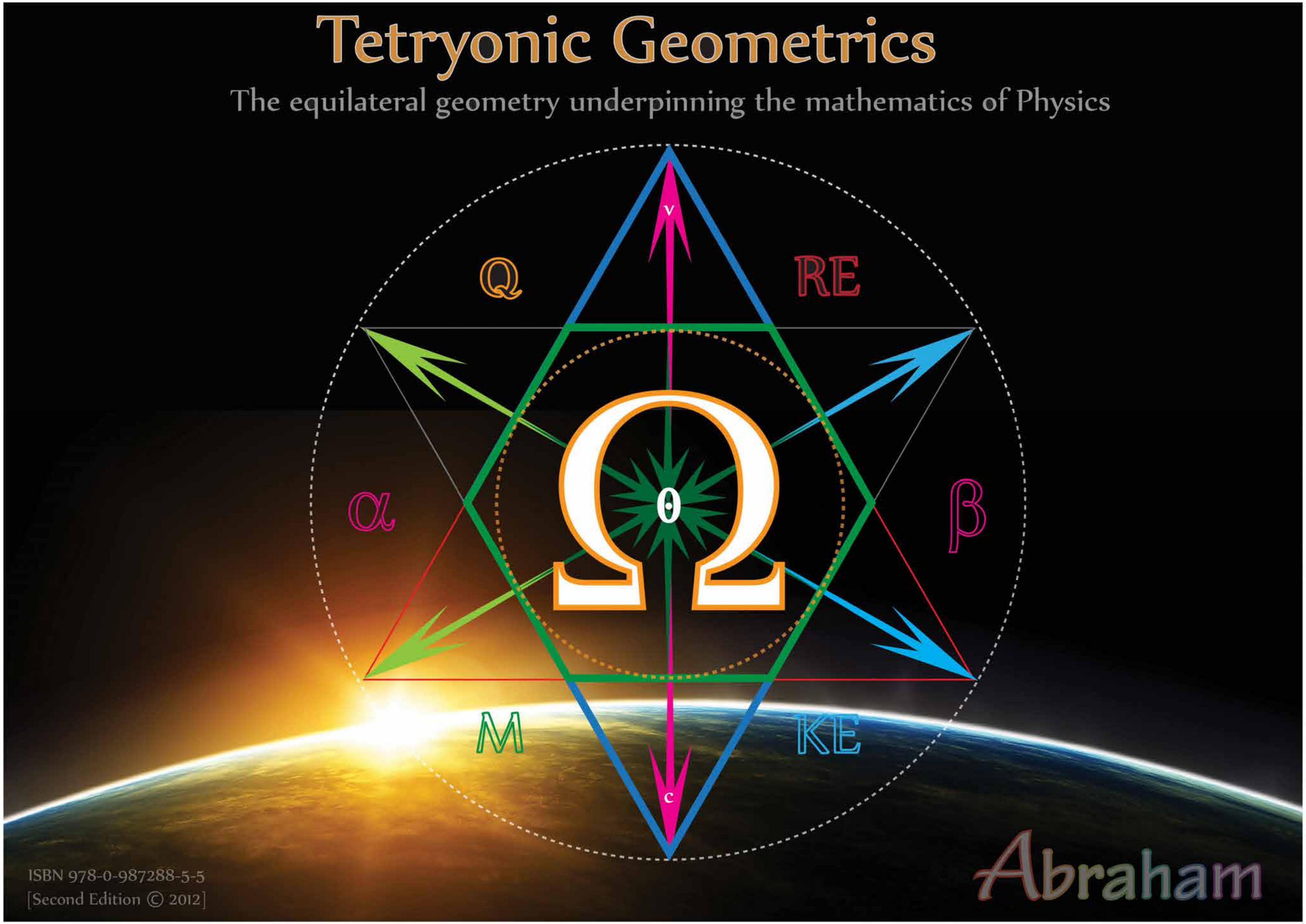
Tetryonics 99.04 - Charged Planck mass-ENERGY-Matter


All squared energies have equilateral geometries
Q
RE
Proton
2D
radiant
mass-energy
geometries
opposites charges attract
Energy in all its forms
seeks equilibrium
interaction
gravitation
same charges repel
hν
v²
3D
standing-wave
Matter
topologies
M
KE
Neutron
There are NO infinities
only Eternity


Clean, limitless Energy
Unlimited resources
The geometric field equation of mass-ENERGY-Matter
Matter
spatial
Planck
quanta
$T\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$
topology
impedance
mass
velocity
Unifying Science and Religion



Tetryonic Theory
All EM mass, energy momenta & Matter can be measured and geometrised with respect to equilateral Quantised Angular Momenta
charged Planck quanta
Bosons
ODD π / c²
Planck quanta
mΩv²
mass velocity
Total Relativistic energies
ENERGY
nπ
Planck quanta
mΩv²
mass velocity
Quantum Mechanics
Q
[v-v]
RE
Quantum Cosmology
v
Quantum levels
standing-wave mass-Matter
electromagnetic field quanta distributions
radiant EM mass-energies
wave functions
Quantum Chemistry
hv
M₀
KE
v²
Electrodynamics
Tπ / c⁴
mΩv²
quanta
EM waves
EVEN π / c²
Planck quanta
mΩv²
mass velocity
3D standing-wave mass/Matter topologies
The application of equilateral QAM geometries covers all of the Physical disciplines
2D radiant mass-energy geometries


Tetryonic Geometrics
The equilateral geometry underpinning the mathematics of Physics
v
Q
RE
α
β
0
M
KE
c
Abraham
ISBN 978-0-987288-5-5
[Second Edition © 2012]