[1] Sphere Geometry of Forces & Fundamental Particles of the Universe

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[3] Abstract

This answers fundamental questions from Wikipedia about Generations of Matter [**web 1] and related properties.
Why are there three generations of quarks and leptons? Why are the ratios of masses of quarks and leptons as they are?
Also, is the ratio of fundamental force strengths related to the size of the universe and why are the ratios as they are?
This theory defines a “fundamental sub-structure" that is a tetrahedron with the further “sub-structure" of spheres.
The 1, 3, 6 “quantum numbers” ratios in this theory show why the relative masses & radii of quarks and the “large leptons” are their “known values”. The ratios for each of these “fundamental sub-structure", “quantum numbers” are 1, 3 & 6; simple integer values.
Another geometrical possibility, with the same values, is based on the spatial axes.
The big picture could be the arrangement of the “fundamental spheres” along the axes of space.
This theory suggests the “fundamental sub-structure" is behind the relative masses of the quarks& “heavy leptons”. The cube root of the mass was used to calculate a diameter ratio parameter. These ratios are also applied to other basic properties of the universe. This “fundamental sub-structure" has also been applied to the relative strengths of the fundamental forces determining the size of the universe at the time of their creation.
There seems to be a universal “template” for the properties of the universe. The ratio numbers can be thought of as "quantum numbers".
The universe is believed to have gone through creation of forces, inflation stages & must, of necessity, have gone through “phase changes". These could be interconnected.
This “theory” combines the above items into ONE overall “theory”.

[2] Author(s) / Editor(s)

[3]Index

[Some parts of this report are repeated in other sections, where appropriate.]

[5] Theoretical Overview

[A] _ Force strengths & the size of the universe _

[5A] Overview

This answers fundamental questions from Wikipedia about Generations of Matter [**web 1] and related properties.
http://en.wikipedia.org/wiki/List_of_unsolved_problems_in_physics#High_energy_physics.2Fparticle_physics
[[[Generations of matter
Why are there three generations of quarks and leptons? Is there a theory that can explain the masses of particular quarks and leptons in particular generations from first principles?]]]
This theory defines a “fundamental sub-structure" that is a tetrahedron with the further “sub-structure" of spheres. The sphere “sub-structure" can be visulised as like a triangular layer of 6 cannonballs with another triangular layer of 3 cannonballs on top of the 6, another, single cannonball on top.
The 1, 3, 6 “quantum numbers” ratios in this theory show why the relative masses & radii of quarks and the “large leptons” are their “known values”. The ratios for each of these “fundamental sub-structure", “quantum numbers” are 1, 3 & 6; simple integer values.
Another geometrical possibility, with the same values, is based on the spatial axes. Again, there are the same three values
SPHERICAL – has ZERO “ends” (0 linear axis), in effect 1 spherical axis.
CARTESIAN – has 3 ends if only positive values are considered (& has 6 ends if positive and negative values are considered.)
CARTESIAN is where the ENDS of the x, y, & z axes are joined together. (For positive values only.)
3D MALTESE CROSS is where the CENTRES of the x, y, & z axes are joined together. (For positive and negative values.)
The big picture could be the arrangement of the “fundamental spheres” along the axes of space.
This theory suggests the “fundamental sub-structure" is behind the relative masses of the quarks& “heavy leptons”. The calculations, for the quarks and “heavy leptons”, uses “Relative mass diameter ratio” which are based on the cube root of the mass. These ratios are also applied to other basic properties and the size of the universe. The ratios for each of these “fundamental sub-structure" are 1, 3 & 6.
There seems to be a universal “template” for the properties of the universe. This can be thought of as a mnemonic for the inter-relationships of the properties. The ratio numbers can be thought of as "quantum numbers".
This “fundamental sub-structure" has also been applied to the relative strengths of the fundamental forces determining the size of the universe at the time of their creation.
The Planck diameter is used for equating the strongest relative force strength to the smallest relative diameter [of the universe]. The Planck diameter is the smallest size within which our known laws of physics are applicable!
The universe is believed to have gone through creation of forces, inflation stages & must, of necessity, have gone through “phase changes". These could be interconnected.
In the creation of the universe, most people would be prepared to accept the sequence of creation of properties as:-
[1] time
[2] space
[3] charge
[4] mass - plasma
[5] mass - neutral
This “theory” combines all the above items into ONE overall “theory”.

[5B] Geometry:Spherical & Density

Volume of a sphere = (4/3) * pi * r^(3)
Volume = mass / density
(Assuming that the density of the different particles are the same.)
Mass radius {proportional to} {mass / [(4/3) * pi * density]}^(1/3)}
Mass radius {proportional to} {mass / (constant)}^(1/3), where, (constant) = [(4/3) * pi * density]
“Relative mass radius ratio” = {[mass A/ [mass B]}^(1/3)}
“Relative mass diameter ratio” = “Relative mass radius ratio"
Therefore diameter {proportional to} [mass]^(1/3)
Relative mass diameter ratio [rmdr-l] (leptons) is relative to the down quark.
Relative mass diameter ratio [rmdr-q] (quarks) is relative to the down quark (because 1. the mass is close to the up quark but 2. the ratios are better using the down quark mass.)

[5C] Geometry:- Tetrahedral Sphere Stacking

The model for the template can be envisaged by building up a triangular pyramid of cannonballs, snooker or pool balls.
The balls interlock to the layer underneath.
The triangular pyramid is built up with only three balls along each side of the base and three layers high.
The top layer [called the primary layer, _p_] has one ball.
The next layer down [called the secondary layer, _s_] has three balls.
The bottom layer [called the tertiary layer, _t_] has six balls.
This shape is a tetrahedral.
There are two possible arrangements of the combination of the primary & secondary layer which are mirror images of each other. There are many possible arrangements of tertiary layer. The relative significance of the possible arrangements differ from one diagram to the next. The inter-relationships between the secondary and the tertiary layer depends on the relative arrangements of the two layers. Each edge of three balls has another edge of three balls which are at right angles to it from one viewpoint.
As per diagram below.
Line code
. _p_1 [*]

= = = = = = = = = = = = = = = = =
. _s_1 [*]

. _s_2 [*] [*]
= = = = = = = = = = = = = = = = =

. _t_1 [*]

. _t_2 [*] [*]

. _t_3 [*] [*] [*]######

[6] Theoretical Details

[C] __The "3-on-each-side" tetrahedral structure of the universe.__

The 6 tetrahedral groupings are:-
{A1} Atomic "Structure Constructors"
{A2} Time-space-charge "Structure Constructors"
{B1} Atomic Force Carriers
{B2} "Mass / Matter Force Carriers"
{C1} Quarks - Relative Mass Diameter Ratio
{C2} Leptons - Relative Mass Diameter Ratio

[Structural details of the "contents" are in the **[11] Experimental Data Manipulation and Analysis** section]

[7] Experimental Equipment, Setup & Method

Many high energy particle accelerators from around the world have been used to measure the values of the fundamental particles & forces. Neutrino masses are still very uncertain. The source of the values used are listed in the

[16] References & Web Links section

[8] Experimental Data

[**web 2]

Leptons

Electron	[rmdr-l] = 1, (0.5)	mass = 0.511	(MeV/c2)	[0.51]
Muon	[rmdr-l] = 3,	mass = 105.7	(MeV/c2)	[105]
Tau	[rmdr-l] =6,	mass = 1777	(MeV/c2)	[1770]

Quarks

up	[rmdr-q] = 1,	mass = 1.5–3.3	(MeV/c2)	[3.3]
down	[rmdr-q] = 1,	mass = 3.5–6.0	(MeV/c2)	[6]
charm	[rmdr-q] = 6,	mass = 1,160–1,340	(MeV/c2)	[1340]
strange	[rmdr-q] = 3,	mass = 70–130	(MeV/c2)	[130]
top	[rmdr-q] = 30,	mass = 169,100–173,300	(MeV/c2)	[173300]
bottom	[rmdr-q] = 9,	mass = 4,130–4,370	(MeV/c2)	[4370]

The mass ratio: (down quark)/ electron = [approx] 10

Forces

The relative strengths of the forces and the order of these are (The range type is either infinite or local):-

[1] strong nuclear; * 10^38 (local)

{A} Difference = *10^2 ::: Factor * 1 ::: Adjusted Factor * 2

[2] electromagnetic; *10^36 (infinite)

{B} Difference = *10^11 ::: Factor * 6 ::: Adjusted Factor * 6

[3] weak nuclear; *10^25 (local)

{C} Difference = *10^25 ::: Factor * 12 ::: Adjusted Factor * 12

[4] ;

[5] gravity; *10^ 0 [= 1] (infinite)

NOTE:- The range type alternates. (Grouping the two mass type together.)

The universe is believed to have gone through creation of forces, inflation stages & must, of necessity, have gone through “phase changes". These could be interconnected.

[9] Experimental Data Manipulation and Analysis

[9A] Data Fundamentals

The ratios for each of these “fundamental sub-structure" are 1, 3 & 6.

The assessment, for the quarks and “heavy leptons”, uses “diameter ratios” which are based on the cube root of the mass.

This is based on:-

Volume of a sphere = (4/3) * pi * r^(3)

Volume = mass / density

Therefore diameter {proportional to} [mass]^(1/3)

(Assuming that the density of the different particles are the same.)

The assessment, for the forces, uses “diameter difference ratios” which are based on:-

[1] Equating a diameter parameter to the reciprocal of the relative (gravity = 1) strength of each force

[2] The smallest relative diameter parameter is then equated to the Planck diameter.

[3] The “diameter difference ratios” is then the next smaller value subtracted from the larger value.

[9B] “Contents” of the 6 Tetrahedrals

The details are:-

{A1} Atomic “Structure Constructors”

Line code

. _p_1 1 atom

. _s_1 (a) (a) + (b) = 3 atom parts

. _s_2 (b) [(a) neutron, (b) electron, (b) proton,]

. _t_1 (a) (a) + (b) + (c) = 6 leptons

. _t_2 (b)

. _t_3 (c)

NOTE:

[a] A possible 6 lepton arrangement (moving in a clockwise direction around the triangle). Each point is a lepton. The triangle peaks are the large leptons & the next side mid-points are the associated type of lepton neutrinos.]

#[1 lepton name]#

[electron]

[electron neutrino]

[muon]

[muon neutrino]

[tau]

[tau neutrino]

{A2} Time-space-charge “Structure Constructors”
Line code
. _p_1 1 time dimension

. _s_1 (a) (a) + (b) = 3 axes = (3 space axes), (0 charge axis), (0 mass axis)
. _s_2 (b)

. _t_1 (a) 1 mass “charge”. (a) + (b) + (c) = 6 “charges”
. _t_2 (b) 2 electromagnetic charges
. _t_3 (c) 3 colour “charges”

NOTE:
[a] 1 mass “charge” is a “self-referential attractive charge”. Every mass attracts every other one. The summary of all the structures here “do not have room” for gravity force carriers, so the force must be “transmitted” and / or “received” without a force carrier. This does not necessarily mean that there is NO possibility of gravitational waves but it is a severe limitation!
The inescapable conclusion is that the space-time distortion is the “force carrier”!
The “primary force” aspect of the strong force (mentioned below) is the “mass charge” attraction force.
There may even be a long-term element that could be viewed as “the planet stuck to a “rubber space-time sheet"”. It can move so far away from its original position but is confined to “return to it”.
The strong force must have another “residual force" which, in effect must be a “primary force" which exists before the creation of “the known strong force carriers". [This is because of the order of the forces being aligned with the order of the properties.] This “primary force" is “tied to the space property”. This would be a space based force. (This “residual force” does not require force carriers.) The common name for this force is GRAVITY! Surprisingly, this conveniently ties together the interaction between space & mass, via (a “new" aspect to) the strong force.

[b] For the “charges” layer, the properties depend on the number of items of a certain type.

[1] Mass “charge”	ONE type	ONE property	attraction
[2] Electromagnetic charge	TWO types	TWO properties	attraction, repulsion
[3] Colour charges	THREE types	THREE properties	attraction, repulsion, colour

SPECIAL NOTE on {3 axes (3 space, 0 charge, 0 mass}

property .	axes
space . . .	3; x, y, z
charge . .	0; spherical
mass . . .	0; spherical

total axes = 3 (as per tetrahedral placement)
The "Why" of mass & charge having spherical geometry after space is created!

{B1} Atomic Force Carriers
Line code
[Electromagnetic]
. _p_1 1 photon

[weak]
. _s_1 (a) z0 (a) + (b) = 3 intermediate vector bosons
. _s_2 (b) [(a) z0, (b) w-, (b) w+]
[strong]
. _t_1 (a) (a) + (b) + (c) = 6 gluon colour charge pairings
. _t_2 (b)
. _t_3 (c)
NOTE: [1] A possible 6 gluon colour charges arrangement (moving in a clockwise direction around the triangle). Each point has a pair of one normal colour & one anticolour gluon colour charge. The triangle peaks have the first colour as normal & the second as anticolour & the next side mid-points is the second colour as normal & the first as anticolour

#[1 normal colour, 1 _anticolour]

[r, -b]
[b, -r]
[b, -g]
[g, -b]
[r, -g]
[g, -r]

[2] There is another TWO gluon colour charges, but these are composite gluon colour charges.
{[r, -r] + [b, -b] } (red anti-red) – (green anti-green)
{[g, -g] + [b, -b]} (green anti-green) – (blue anti-blue)

{B2} “Mass / Matter Force Carriers”
Line code
. _p_1 space // gravity // 1 Higgs boson

. _s_1 (a) (a) + (b) = “3 levels of matter”
. _s_2 (b) [(a) {up & down}, (b) {charm & strange}, (b) {bottom & top}]

. _t_1 (a) (a) + (b) + (c) = 6 quarks
. _t_2 (b) ([up & down], [charm & strange], [bottom & top])
. _t_3 (c)

NOTE: [1] The lower “quantum numbers" would mean that up & down quarks are the most stable.
[2] A possible 6 quark arrangement (moving in a clockwise direction around the triangle). The triangle peaks are +2/3 & the side mid-points are -1/3.
#[quark name, charge (proton charge), mass (Mev)]#
[up, +2/3, 2]
[down, -1/3, 5]
[charm, +2/3, 1270]
[strange, -1/3, 101]
[top, +2/3, 172000]
[bottom, -1/3, 4400]

{C1} Quarks - Relative Mass Diameter Ratio
Line code

. _p_1 1 up quark // down quark

. _s_1 (a) (a) + (b) = 3
. _s_2 (b) strange quark

. _t_1 (a) (a) + (b) + (c) = 6 charm quark
. _t_2 (b)
. _t_3 (c)
NOTE:- Other quarks - Relative mass diameter ratios
bottom quark = 9 (= 3 * 3 or 3 * secondary layer)
(or more likely = 10 (= [1 + 3 + 6] = 1 * complete tetrahedron) [**needs checking!**]
top quark = 30 (= 3 * [1 + 3 + 6] or 3 * complete tetrahedrons)

{C2} Leptons - Relative Mass Diameter Ratio
Line code

. _p_1 1 electron

. _s_1 (a) (a) + (b) = 3 muon
. _s_2 (b)

. _t_1 (a) (a) + (b) + (c) = 6 tau
. _t_2 (b)
. _t_3 (c)

[e] The inter-relationships of items within the table below (for the different tetrahedral structures) can be simplified by thinking of:-
(1) a drawing a series of six equilateral triangles joined together at one common point to form a hexagon.
(2) each triangle divided into three parts by two lines parallel to its base.
(3) the order for the triangles (in a clockwise direction) is A1, A2, B1, B2, C1, C2
(4) the orientations for the triangles:
All triangles have their tops (primary levels) in the centre of the hexagon & the bases towards the outside of the hexagon.

[9C] Tetrahedral Interconnection Table

tetra code — tetra description
[primary _p_]
secondary _s_
(tertiary _t_)

{A1} Atomic "Structure Constructors"
;_p_ [atom]
;_s_ atom parts (charges)
;_t_ (leptons)

{A2} Time-space-charge "Structure Constructors"
;_p_ [time]
;_s_ space, charge, mass
;_t_ (charges)

Tetra {A1}, Atomic "Structure creator" with Tetra {A2}, Time-space-charge "Structure Constructors" would be the "structure carriers" di-tetrahedral.
2 = 2 * 1 _p_, 6 = 2 * 3 _s_, 12 = 2 * 6 _t_.

{B1} Atomic force carriers
;_p_ [photon]
;_s_ inter. vector bosons
;_t_ (gluon colour charges)

{B2} "Mass / Matter Force Carriers"
;_p_ space // gravity // 1 Higgs boson
;_s_ 3 level matter particles
;_t_ (quarks)

Tetra {B1}, Atomic Force Carriers with the Tetra {B2}, / "Mass / Matter Force Carriers" would be the "force carriers" di-tetrahedral. The "Adjusted Factors" for the forces correspond to the levels for the {B1}, {B2} di-tetrahedral.

{C1} Quarks - Relative Mass Diameter Ratio
;_p_ [up // down quarks]
;_s_ strange
;_t_ (charm)

{C2} Leptons - Relative Mass Diameter Ratio
;_p_ [electron]
;_s_ muon
;_t_ (tau)

{A1} Atomic Structure
;_p_ [atom]
;_s_ atom parts (charges)
;_t_ (leptons) (repeated sector, helping to show the adjacent relationships.)

Tetra {C1}, Quarks - relative mass diameter ratios with the Tetra {C2}, Leptons - relative mass diameter ratios would be the “relative mass radius ratio” di-tetrahedral.
An earlier di-tetrahedral, on a different level, containing the laws of physics, conservation laws and equivalence principles would not be impossible.
There is strong inter-relationships between the adjacent layers of each tetrahedron, especially the adjacent layers from the same di-tetrahedral.
Summing the total dimensions across the {A1} & {A2}, {B1} & {B2}
tetrahedrals only we have.
primary level: 4 * 1 = 4
secondary: 4 * 3 = 12
tertiary: 4 * 6 = 24
Summing the total dimensions across the {A1} & {A2}, {B1} & {B2}, {C1} & {C2}
tetrahedrals only we have.
primary level: 6 * 1 = 6
secondary: 6 * 3 = 18
tertiary: 6 * 6 = 36
Comparisons for string theory
Dimensions for string theory solutions 10, 11 & 26 dimensions.

The creation of properties with added interconnections:-
[ ] PROPERTY
;(a) ASSOCIATED FORCE
;(b) RELATIVE FORCE STRENGTH [c.f. gravity force]
;(c) RELATIVE SIZE [m]
;(d) ::: ADJUSTED FACTOR
[The ADJUSTED FACTOR is the
diameter expansion ratio = [next level RELATIVE SIZE] / [current level RELATIVE SIZE]
[At end of each (1) “universe phase change”, = (2) inflation period, = (3) “force creation period”.]
;(e) RELIC PROPERTIES]

[of the property, unless otherwise stated.]
[1] time
;(a)
;(b)
;(c)
;(d) [::: ADJUSTED FACTOR = ?]
;(e)

[2] space
;(a) strong force
;(b) *10^38
;(c) *10^-35 [= Planck length diameter]]
;(d) ::: ADJUSTED FACTOR = 2
;(e) RELIC PROPERTIES of the strong force:-
[(1) The strong force has a residual force which holds together protons and neutrons in an atom. (This residual force does not require force carriers.)
(2) The strong force must have another “residual force" which, in effect must be a “primary force" which exists before the creation of “the known strong force carriers". [This is because of the order of the forces being aligned with the order of the properties.] This “primary force" is “tied to the space property”. This would be a space based force. (This “residual force” does not require force carriers.) The common name for this force is GRAVITY! Surprisingly, this conveniently ties together the interaction between space & mass, via (a “new" aspect to) the strong force.

[3] charge

;(a) electro-magnetic force

;(b) *10^36

;(c) *10^-33

;(d) ::: ADJUSTED FACTOR = 6

;(e) very high energy electromagnetic radiation. There would be a lowest energy electromagnetic radiation "cut off" corresponding to the lowest temperature reached at the end of this phase. This radiation would be subjected to a high degree of wave interference in the plasma phase, because of the high density of the universe at this time.

[4] mass - plasma

;(a) weak force

;(b) *10^25

;(c) *10^-22

;(d) ::: ADJUSTED FACTOR = 12

;(e) Neutrino radiation. Very high energy neutrinos from the first "bulk conversion" of energy to matter. There would then be a lowest energy neutrino "cut off" corresponding to the lowest temperature reached at the end of this phase. After this neutrinos get created in individual stars, with the size of largest stars in the universe gradually decreasing because of increasing clumpiness of matter.

In the mass - plasma phase the mass is greatly confined by the charges & magnetic fields present. Charges & magnetic fields prevail over mass.

This plasma phase would have a major effect of increasing the homogeneity of the universe and reducing evidence of the past history of the universe.

[5] mass - neutral

;(a) gravity force

;(b) *10^0 [= 1]

;(c) *10^+3

;(d)

;(e) Cosmic microwave radiation. There would then be a lowest energy electromagnetic radiation "cut off" corresponding to the lowest temperature reached at the end of this phase. The hot temperature at the end of the plasma stage was emitting electromagnetic radiation because of its heat. This hot temperature radiation was stretched in frequency by the expanding universe into cosmic microwave radiation.

([6]) our current universe (data from Wikipedia)

;(a)

;(b)

;(c) ACTUAL SIZE 10^27 [m] [93 * 10^9 light years * 1 * 10^16 m/yr traveled by light]

; RELATIVE SIZE 1100 * size at point of last plasma radiation [origin of cosmic microwave radiation.]

This means that the calculated size at origin of cosmic microwave radiation would be about 10^24 m.

This compares to the value in [5] mass - neutral ;(c) of *10^+3.

In the mass - plasma phase the mass is greatly confined by the charges & magnetic fields present.

In the mass - neutral phase the neutral mass is freed to inflate the universe much faster. Could this account for an inflation factor of 10^21?!

[10] Theoretical Predictions

The value for the ratio for the electron is nearer to 1/2 rather than 1.0. This is one of the exceptions to the data fitting. There may be some binding energy involved.

[11] Experimental Data Still Required to Confirm Theory

The ratios for the masses of neutrinos have not been calculated. The masses of neutrinos would suggest a subset to this theory, as the top & bottom quark masses suggest a superset.

[12] Possible Technological Applications & Implications

If gravity is a “primary force” “aspect of the strong force” there would be no gravity force carriers (gravitons) or gravity waves. The large scale detectors would be “white elephants”. So far no gravity force carriers (gravitons) or gravity waves have been detected.

[13] Discussions

[B] _The “quantum numbers” of quark & lepton radii for tetrahedral theory_

The [rmdr-l] & [rmdr-q] values tie in with the “quantum numbers” of the “tetrahedral theory” (apart from the bottom & top values).
If the bottom & top quarks were unknown, it would be a brave theorist that would predict them from the other data. (FYI 9 = 3 * 3 & 30 = 3 * [1 + 3 + 6]) (In effect “super-tetrahedrons of {C1}” “outside” the “normal"{A1} & {A2}, {B1} & {B2}, {C1} & {C2} system). Neutrinos too, are “outside” the “normal". They could fit into a “sub-tetrahedral of {C2}".
Equating an electron to a top quark would then equate neutrinos to a bottom quark for [rmdr]. The ratio of electron to neutrins rmdrs would approximate to the ratio of top quark to bottom quark [rmdrs]. The electron neutrino would be expected to be different from the other two.
The above integers are for differing diameters. The tetrahedron theory numbers are for tetrahedron stacking of spheres. It must be assumed that the two different systems require FOUR DIMENSIONS to be amalgamated!
BUT the radii could be for the spinning tetrahedron [sometimes just layers] in 3 DIMENSIONS.
This theory is for the sub-structure of quarks and leptons. Basically its all spheres (not strings) at the most basic level!
The value for the ratio for the electron is nearer to 1/2 rather than 1.0. This is one of the exceptions to the data fitting.
There may be some binding energy involved.

[14] Conclusions

The “Big Bang Bootstrap Program” started with “Big Bang in Time” and then initiated the tetrahedral substructures / “programs”, outlined in the above table, for building a universe!
The “Big Bang Bootstrap Program” would start with the single items at the top of the tetrahedrals and inflate / expand / evolve to create the other levels in sequence.
The “Big Bang Bootstrap Program” would start with the {A2} section on each level.
The “A" & “B" sectors would complete before the “C" sector was created.
The change to another level creates more "dimensions". More dimensions means more entropy which means more energy which can then create more matter.
There must have been “bootstrap sub-programmes” to the creation of the universe.
[1] Causality. i. e. There is a cause for every effect or observation.
[2] Sequence. i. e. Space must be created before matter! Charge must be created before ionic bonds! etc.
[3] Laws. i.e. The laws of physics, conservation laws and equivalence laws must surely exist before the entities involved in these.
[4] Time. i.e. Time must come first. (or maybe the laws.) Nothing changes without time.

[15] Unresolved Problems & Future Research Required

Many high energy particle accelerators from around the world have been used to measure the values of the fundamental particles & forces. Neutrino masses are still very uncertain.
Neutrinos too, are “outside” the “normal theory". They could fit into a “sub-tetrahedral of {C2}".
Equating an electron to a top quark would then equate neutrinos to the lower mass quarks for [rmdr]. The ratio of electron to neutrino [rmdr] could approximate to the ratio of top quark to bottom quark [rmdr]. The electron neutrino would be expected to be different from the other two.

[16] References & Web Links

[**web 1] :: unsolved problems in physics; 1.3 High energy physics/particle physics Generations of Matter subsection.
http://en.wikipedia.org/wiki/List_of_unsolved_problems_in_physics#High_energy_physics.2Fparticle_physics
[**web 2] :: masses of quarks and leptons
http://en.wikipedia.org/wiki/File:Standard_Model_of_Elementary_Particles.svg
[**web 3] :: nuclear density [a associated link found after report completed]

http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
All queries to be sent to the Author's email address.
This is a "breaking ground" paper for this area of research and is therefore, general and speculative. There will be varying degrees of congruence with this theory / model and the measurements of reality. There is much work to be done on the more advanced mathematics of the mechanics of the processes involved.