What is Fundamental ? NOTHING is Fundamental !!!

Frank Dodd (Tony) Smith, Jr. - 2017

Fundamental = Starting Point of a Process Describing Realistic Physics
including **Lagrangian** and **Algebraic Quantum Field Theory (AQFT)**.
The Starting Point of Our Universe was a Fundamental Spinor Void
Void = NOTHING so NOTHING is Fundamental

This paper explores the Process,
which allows calculation of Standard Model Particle Masses and Force Strengths.

Page 2 is a Graphic Overview.

Pages 3-13 **What is Fundamental? NOTHING is Fundamental !!!**

Pages 14-110 are my 2018-2019 Calendar with Red Book appendix.

Pages 111-114 are about Leonardo DaVinci's Salvator Mundi and E8.

Void -> Cl(Void) -> Cl(0) -> Cl(1) -> Cl(2) -> Cl(4) -> Cl(16)

Kaluza-Klein Spacetime
M4 x CP2

Cl(8) that contains 28 = D4 for M4 Gravity	Cl(8) that contains 28 = D4 for CP2 Std Model	
		1
		16
		120
		560
		1820
		4368
		8008
		11440
1	1	12870
8	8	11440
28	28	8008
56	56	4368
70	70	1820
56	56	560
28	28	120
8	8	16
1	1	1

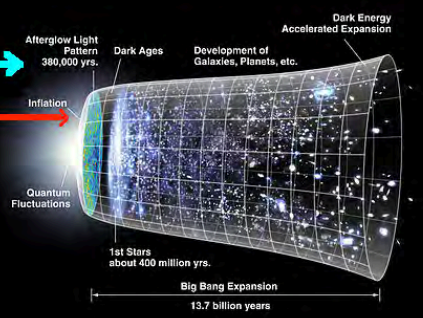
Cl(8) x Cl(8) = Cl(16)

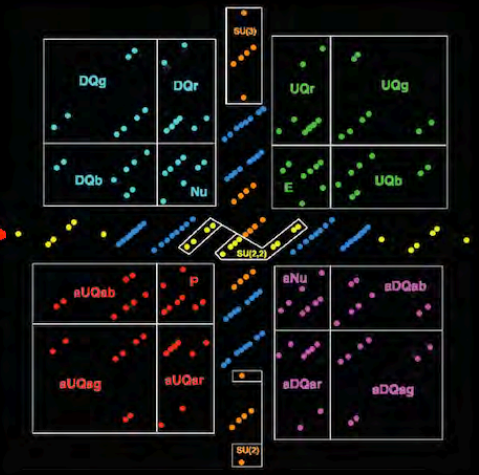
Spinors: (8s x 8s + 8s x 8c)
(8s+8c) x (8s+8c) = +
(8c x 8s + 8c x 8c)

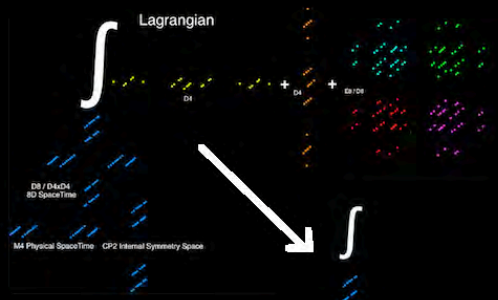
Quantum Resonant Connection

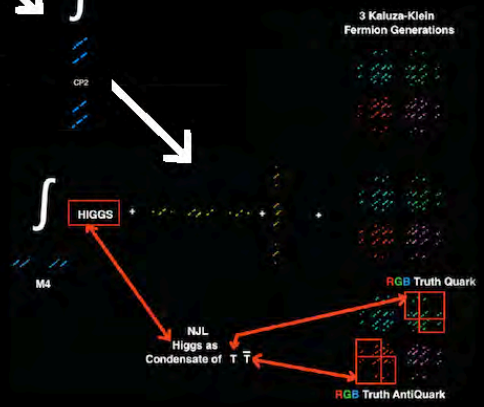
NJL Quantum Condensate

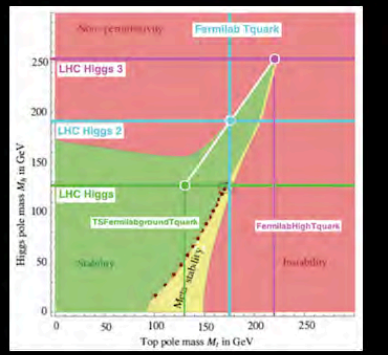
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation







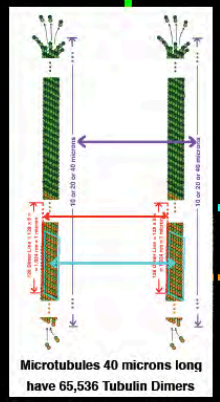




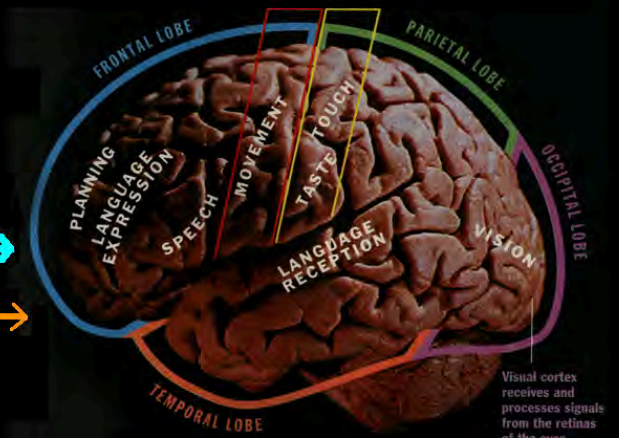
Cl(0,16) x Cl(0,8) = Cl(0,24)

M(2,Cl(0,24)) = Cl(1,25)

Completion of Union of
All Tensor Products of Cl(1,25) = **AQFT**



Penrose-Hameroff Quantum Condensate



10^19 Tubulin Dimers in a Human Brain

What is Fundamental ? NOTHING

Frank Dodd (Tony) Smith, Jr. - 2017

Fundamental = Starting Point of a Process Describing Realistic Physics
including Lagrangian and Algebraic Quantum Field Theory (AQFT).
This paper explores the Process through detailed worked examples.
(for further details and calculations see Smith references)

The Starting Point of Our Universe was a Fundamental Spinor Void
Void = NOTHING so NOTHING is Fundamental

Fundamental Spinor Void  **based on 0-dim Real Clifford Algebra Cl(Void)**
from which emerged by Finkelstein's process of Iterating Clifford Algebra Formation
(Finkelstein, Int. J. Theor. Phys. 2017 56 : 2-39)

Cl(0) = 2^0 = 1-dim

Cl(1) = 2^1 = 2-dim

Cl(2) = 2^2 = 4-dim with 2^1 = 1+1 half-spinor fermions/antifermions

 and 

Cl(4) = 2^4 = 16-dim with 2^2 = 2+2 half-spinor fermions/antifermions

 and 

Cl(16) = 2^16 = 65,536-dim with 2^8 = 128 + 128 half-spinor fermions/antifermions

128-dim Cl(16) Half-Spinors = 2 copies of Geoffrey Dixon's 64-dim RxCxHxO
where R = Real, C = Complex, H = Quaternion, O = Octonion Division Algebras
(Dixon, Division Algebras (O, H, C, and R) and Windmill Tilting)

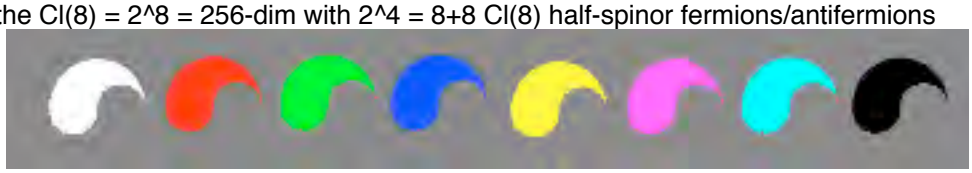
248-dim E8 = 128-dim Cl(16) Half-Spinors + 120-dim Cl(16) BiVectors

By **8-Periodicity of Real Clifford Algebras**

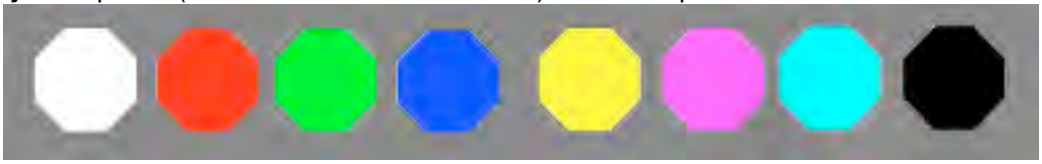
Cl(8) x ...(N times tensor product)... x Cl(8) = Cl(8N)

Cl(16) can be factored into the tensor product Cl(8) x Cl(8)

Each of the Cl(8) = 2^8 = 256-dim with 2^4 = 8+8 Cl(8) half-spinor fermions/antifermions


and


By Triality half-spinors (8 fermions and 8 antifermions) are isomorphic to each other and to 8 vectors



By 8-Periodicity Cl(8) and Cl(16) have basic structure underlying all Real Clifford Algebras.

The Iterated Clifford Algebra Creation Sequence begins with
a Compact Quantum Fluctuation in a Parent Universe (Real Form E8(-248))
that Unfolds into an Octonionic Inflation of Our Universe (Real Form E8(8))

(Smith, viXra 1709.0265)

The Creation Sequence can also be seen in terms of Spinor/Clifford Algebra Doubling

$$Cl(0,0) \to Cl(0,2) \to Cl(0,4) \to Cl(0,6) \to Cl(0,8) \to$$

that goes to Cl(0,8) which has Vector - Half-Spinor Triality
and by 8-Periodicity is the Basic Building Block of Real Clifford Algebras.
The Creation Sequence continues by Tensor Product

$$\to Cl(0,8) \times Cl(0,8) = Cl(0,16) \to Cl(0,16) \times Cl(0,8) = Cl(0,24) \to$$

Cl(0,16) contains the Maximal Exceptional E8 Lie Algebra
Cl(0,24) contains the Vector Space of the 24-dim Leech Lattice Λ24 that is composed of
3 copies of E8 Lattices (2 being Integral Domains and 1 not Algebraically closed)
The Creation Sequence continues by constructing the Conformal Structure
of 2x2 matrices with entries in Cl(0,24) = M(2,Cl(0,24))

(Porteous, Clifford Algebras and the Classical Groups and
Lounesto and Porteous, Lectures on Clifford (Geometric) Algebras and Applications)

$$\to M(2,Cl(0,24)) = Cl(1,25) \to$$

Since all the matrix entries are Cl(0,24) = tensor product of 3 copies of Cl(0,8)
8-Periodicity allows formation of the tensor products of copies of Cl(1,25)

-> Completion of Union of All Tensor Products of Cl(1,25) = hyperfinite AQFT

The hyperfinite AQFT has Real / Octonionic structure inherited from Cl(0,8)
and
it also has Quaternionic structure due to

$Cl(1,25) = Cl(1,9) \times Cl(0,8) \times Cl(0,8)$ and $Cl(1,9) = Cl(1,5) \times Cl(0,4) = Cl(2,4) \times Cl(0,4)$
where
the vector space of Cl(2,4) is 6-dim Conformal Spacetime
which contains 4-dim Minkowski Spacetime M4 of Cl(1,3)
and
the vector space of Cl(0,4) corresponds to CP2 = SU(3) / SU(2)xU(1)
so that **before breaking Octonionic symmetry non-unitarity of Octonion Quantum Processes allows particle creation during the Inflation Era**

(Adler, Quaternionic Quantum Mechanics and Quantum Fields, pages 50-52, 561)

and **after breaking non-unitary Octonionic 8-dim Spacetime**
to unitary Quaternionic Spacetime, thus ending the Inflation Era,
the Spacetime of the hyperfinite AQFT is (4+4)-dim M4 x CP2 Kaluza-Klein
(Real Form E8(-24))

The E8 contained in Cl(0,16) is not a conventional Gauge Group
but
is a Recipe for a Realistic Physics Lagrangian:

Fermion Terms:
E8 / D8 = 128-dim = 8-dim Spacetime Components of 8 Fermion Particles
+
8-dim Spacetime Components of 8 Fermion AntiParticles

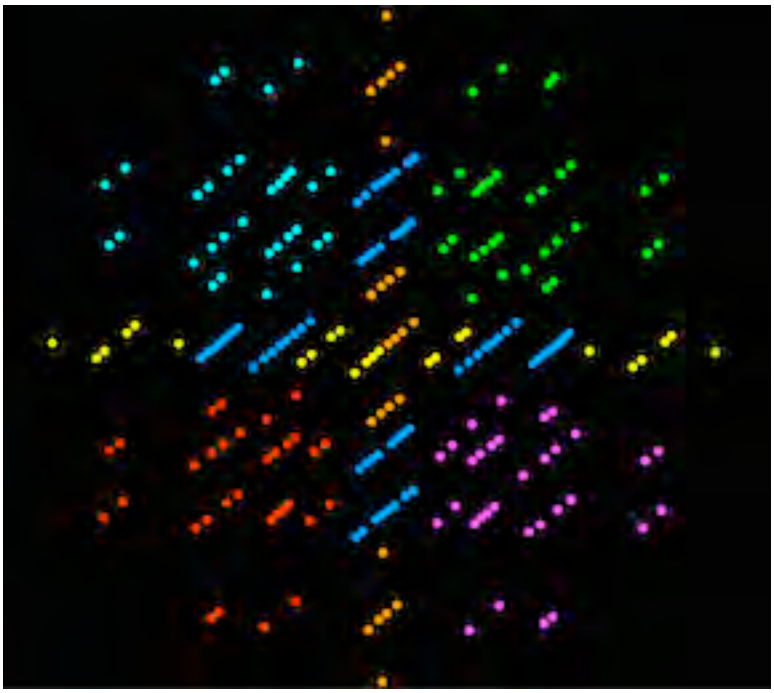
Spacetime Base Manifold Terms:
D8 / D4 x D4 = 64-dim = 8-dim Spacetime Position x 8-dim Spacetime Momentum

Gauge Boson and Ghost Terms:
The two 28-dim D4 correspond to the M4 and CP2 of M4 x CP2 Kaluza-Klein

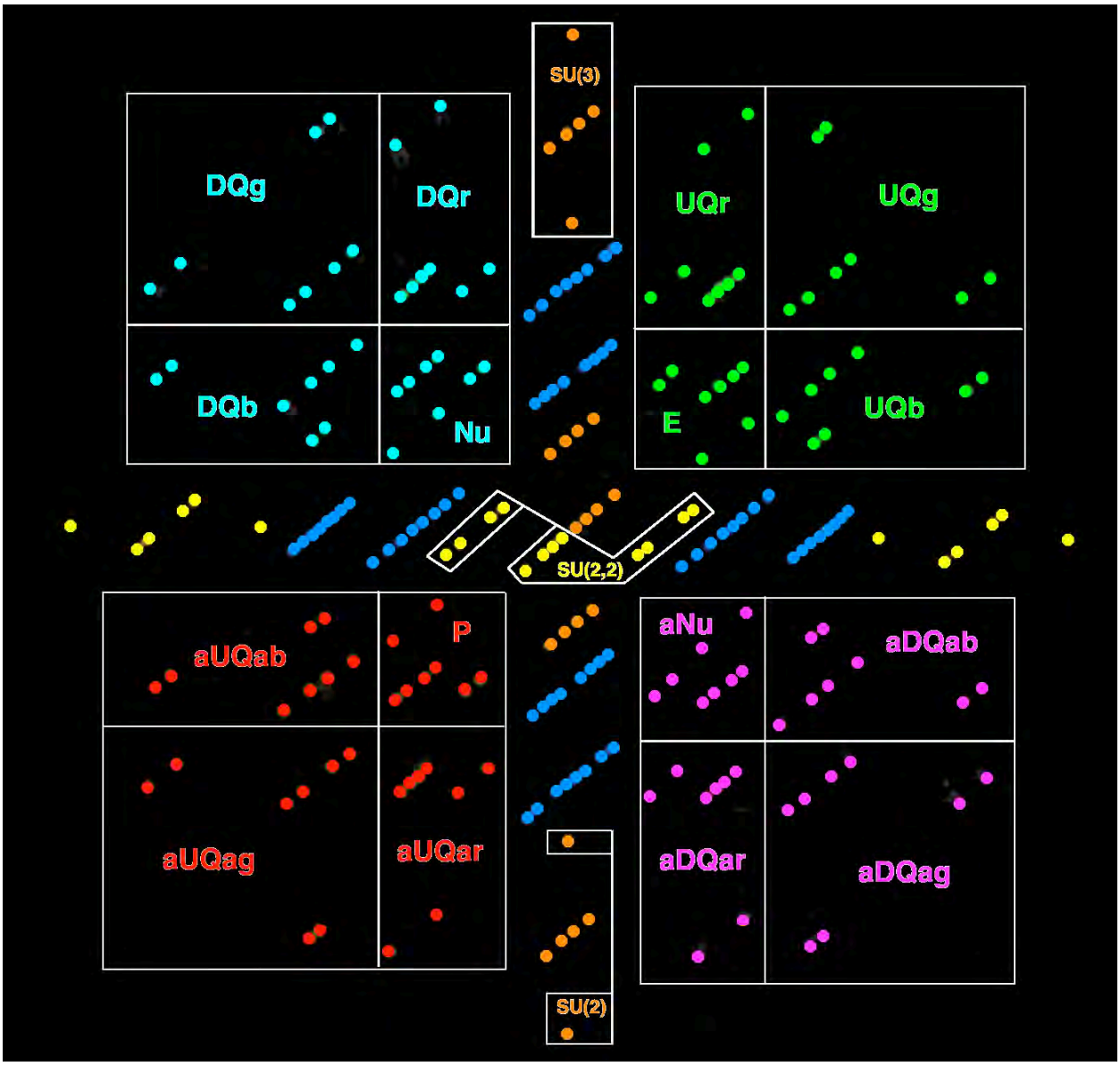
D4_M4 = 16-dim U(2,2) containing SU(2,2) = Spin(2,4) Conformal Gravity
and 12 Standard Model Ghosts

D4_CP2 = 8-dim SU(3) Color Force plus 4 Translation Gravity Ghosts
and 12 Conformal Gravity Ghosts
Electroweak SU(2) x U(1) come from Little Group of CP2 = SU(3) / SU(2) x U(1)
(Batakis, Class. Quantum Grav.3 (1986) L99-L105)

This E8 Structure can be seen in terms of its 240 Root Vectors



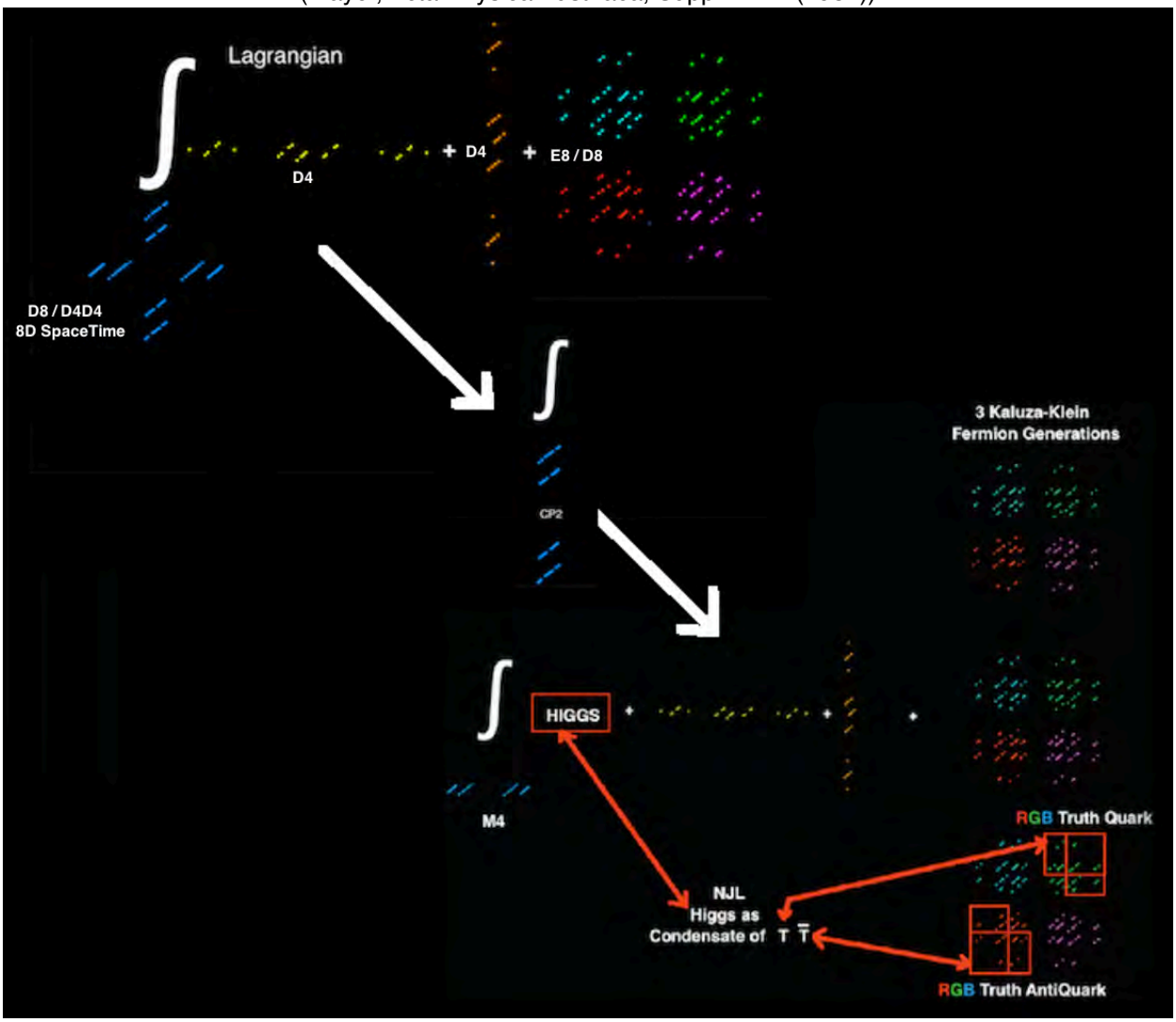
each of which has a realistic Physics Interpretation:



E = electron, UQr = red up quark, UQg = green up quark, UQb = blue up quark
Nu = neutrino, DQr = red down quark, DQg = green down quark, DQb = blue down quark
P = positron, aUQar = anti-red up antiquark,
aUQag = anti-green up antiquark, aUQab = anti-blue up antiquark
aNu = antineutrino, aDQar = anti-red down antiquark,
aDQag = anti-green down antiquark, aDQab = anti-blue down antiquark

Each Lepton and Quark has 8 components with respect to 4+4 dim Kaluza-Klein
6 orange SU(3) and 2 orange SU(2) represent Standard Model root vectors
24-6-2 = 16 orange represent U(2,2) Conformal Gravity Ghosts
12 yellow SU(2,2) represent Conformal Gravity SU(2,2) root vectors
24-12 = 12 yellow represent Standard Model Ghosts
32+32 = 64 blue represent 4+4 dim Kaluza-Klein M4 x CP2 Spacetime Base Manifold
32 for M4 position x 8 momentum and 32 for CP2 position x 8 momentum

Higgs and Second and Third Generation Fermions emerge from breaking
Octonionic Symmetry of the Inflation Era to Quaternionic Symmetry of Present Era.
(Mayer, Acta Physica Austriaca, Suppl. XXIII (1981))

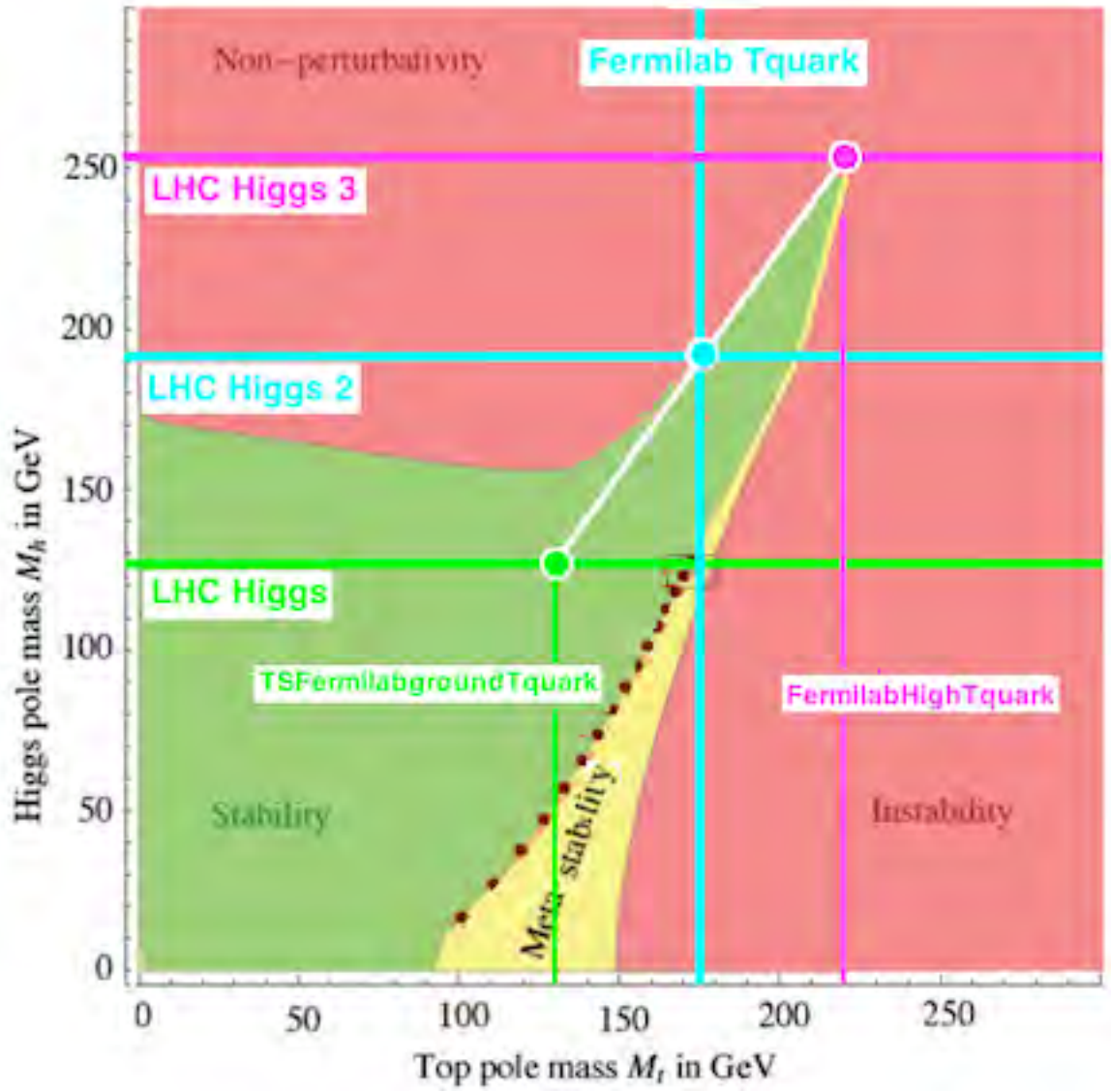


The Higgs is a Condensate of Tquark and Tantiquark resulting in
3 mass states for the Higgs and the Tquark
(Smith, viXra 1701.0496)

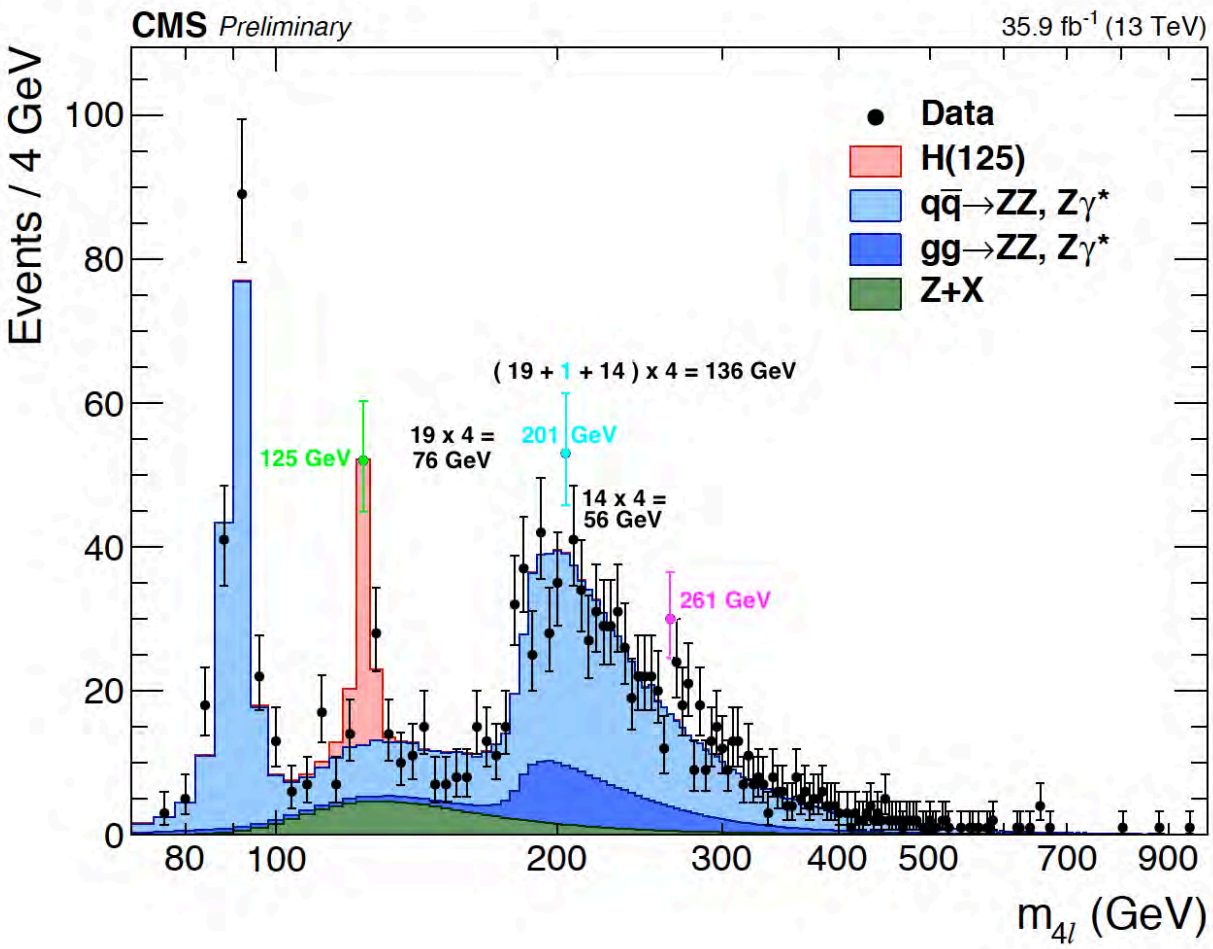
As to the unconventional mass states other than 125 GeV Higgs and 174 GeV Tquark:
ATLAS, for the Full 2016 36.1 fb-1 of 2016 data in the Higgs -> ZZ* -> 4l channel,
on 5 July 2017 released ATLAS-CONF-2017-058 saying:
"... A search for heavy resonances ...[in the Higgs -> ZZ* -> 4l channel]...
uses proton–proton collision data at a centre-of-mass energy of 13 TeV
corresponding to an integrated luminosity of 36.1 fb-1 collected with the ATLAS
detector during 2015 and 2016 at the Large Hadron Collider ...

excess ...[is]... observed in the data for m4l around 240 ... GeV ...
with a local significance of 3.6 sigma ...".
It will be interesting to see whether the 2017 ATLAS data of over 45 fb-1
will confirm or refute the excess at 240 GeV as a Higgs mass state.

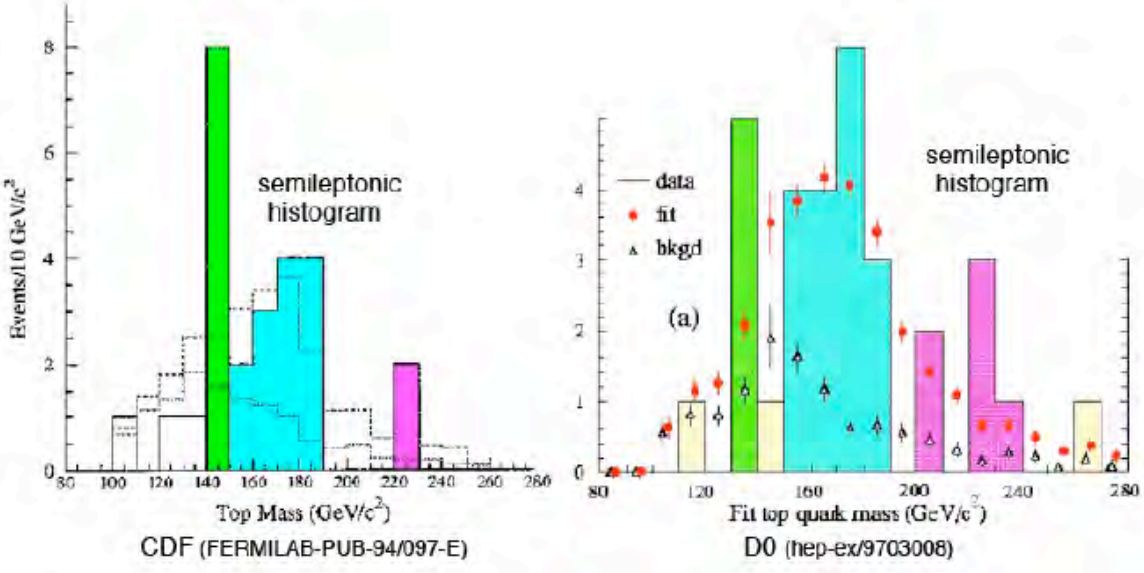
Here is a chart showing the 3 Mass States for Higgs and Tquark (viXra 1701.0496):
green dot in the Stable region (green) has 125 GeV Higgs and 130 GeV Tquark
cyan dot on the Non-perturbativity Boundary has 190 GeV Higgs and 174 GeV Tquark
magenta dot at the Critical Point has 250 GeV Higgs and 220 GeV Tquark



CMS, for their Full 35.9 fb-1 of 2016 data in the Higgs -> ZZ* -> 4l channel,
in CMS-PAS-HIG-16-041 has bins of 4 GeV width and shows all 3 Higgs mass states:
low-mass Higgs state (green) with mass 125 GeV
middle-mass Higgs state (cyan) with mass 201 GeV (close to 190 GeV)
high-mass Higgs state (magenta) with mass 261 GeV (close to 240 and 250 GeV)



Semileptonic histograms of CDF and D0 show all 3 Truth Quark Mass States



low-mass Tquark state (green) with mass 130 GeV
middle-mass Tquark state (cyan) with mass 174 GeV
high-mass Tquark state (magenta) with mass 220 GeV

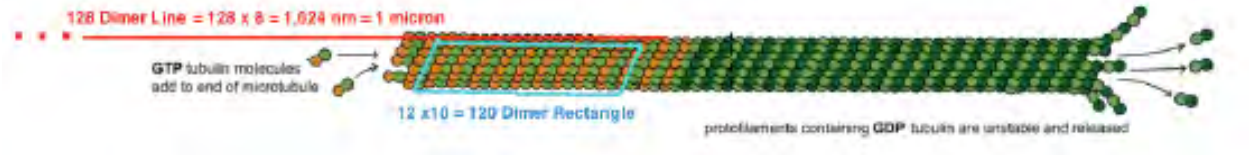
The Completion of Union of All Tensor Products of Cl(1,25) = hyperfinite AQFT

(Smith, viXra 1701.0495)

containing the Realistic Physics of the Lagrangian.
It also contains, due to its Cl(1,25) components,
the structure of 26-dim String Theory
in which Strings are seen as Particle World-Lines,
the massless spin 2 state is the carrier of the Bohm Quantum Potential, and
the SO(24) little group is related to the Monster automorphism group
that is the symmetry of each cell of Planck-scale local lattice structure.

(Green, Schwartz, and Witten, "Superstring Theory" vol. 1)

10-dim String Spacetime is Kaluza-Klein 6-dim Conformal x 4-dim CP2 giving M4 x CP2
8-dim K-K Classical Lagrangian Spacetime as an NJL condensate of Dixon's
64-dim Particle spinor T = RxCxHxO and the 64-dim AntiParticle spinor Tbar
Each cell of E8 Classical Lagrangian Spacetime corresponds to 65,536-dim Cl(16)
which contains 248-dim E8 = 120-dim D8 bivectors +128-dim D8 half-spinors
Human Brain Microtubules 40 microns long have 65,536 Tubulin Dimers



(image adapted from 12biophys.blogspot.com Lecture 11)

and so can have Bohm Quantum Resonance with Cl(16) Spacetime cells
so that **the State of Consciousness of a Human is in exact resonant**
correspondence with a subset of the cells of E8 Classical Lagrangian Spacetime
Therefore **E8 Classical Lagrangian Spacetime NJL Condensate** is effectively the
Spirit World in which the **Human States of Consciousness = Souls exist.**

What happens to a Fundamental Fermion Particle whose World-Line string intersects a Single Cell ?

The Fundamental Fermion Particle does not remain a single Planck-scale entity.
Tachyons create clouds of particles/antiparticles.

(Schroer, hep-th/9908021)

The Fundamental Fermion Cloud looks like a Kerr-Newman Black Hole.

(Arcos and Pereira, hep-th/0210103)

What is the size of the Fundamental Fermion Kerr-Newman Cloud ?

The Cloud is one Planck-scale Fundamental Fermion Valence Particle plus
an effectively neutral cloud of particle/antiparticle pairs. The symmetry of the cloud
is governed by the 24-dimensional Leech lattice by which the Single Cell was formed.
According to the ATLAS at brauer.maths.qmul.ac.uk/Atlas/v3/spor/M/
the maximal subgroup of the Monster M involving Co1 is 2^(1+24).Co1 of order
139511839126336328171520000 = 1.4 x 10^26 As 2.Co1 is the Automorphism group
of the Leech Lattice modulo to which the Single Cell was formed,
and as the 26-dim String Theory Leech Lattice is a superposition of 8 Leech Lattices,
8 x 2^(1+24).Co1 describes the structure of the Cloud. Therefore,
the volume of the Cloud should be on the order of 10^27 x Planck scale containing
10^27 particle/antiparticle pairs with size 10^(27/3) x 1.6 x 10^(-33) cm = 10^(-24) cm.

Fundamental Fermion Clouds are Schwinger Sources.

Sources require Linear Operators
"... represented by a definite integral [of a]... kernel ... function ...".
(Fock, "Fundamental of Quantum Mechanics" (1931))

Kernel Functions for Complex Classical Domains were described by Hua.
(Hua, "Harmonic Analysis of Functions of Several Complex Variables in the Classical Domains" (1958))

Schwinger in 1951 "... introduced a description in terms of Green's functions, what Feynman had called propagators ... The Green's functions are vacuum expectation values of time-ordered Heisenberg operators, and the field theory can be defined non-perturbatively in terms of these functions ...[which]... gave deep structural insights into QFTs; in particular ... the structure of the Green's functions when their variables are analytically continued to complex values ...".
(Schweber, PNAS 102, 7783-7788)

The Classical Domains (complete simply connected Riemannian symmetric spaces) representing 4-dim Spacetime with Quaternionic Structure are:
S1 x S1 x S1 x S1 = 4 copies of U(1)
S2 x S2 = 2 copies of SU(2)
CP2 = SU(3) / SU(2)xU(1)
S4 = Spin(5) / Spin(4) = Euclidean version of Spin(2,3) / Spin(1,3)
(Wolf, J. Math. Mech 14 (1965) 1033-1047)

Wyler showed how to use Green's Functions = Kernel Functions of Classical Domain structures characterizing Sources = Leptons, Quarks, and Gauge Bosons, to calculate Particle Masses and Force Strengths
(Wyler, 1971 - C. R. Acad. Sc. Paris, t. 271, 186-188)

"... We introduce a quantitative description of the particle source in terms of a source function ... we do not have to claim that we can make the source arbitrarily small ... the experimeter... must detect the particles ...[by]... collision that annihilates the particle ... the source ... can be ... an abstraction of an annilhilation collision, with the source acting negatively, as a sink ... The basic things are ... the source functions ... describing the intermediate propagation of the particle ..."
(Schwinger, 1969 - see physics/0610054)

Schwinger Sources can be described by continuous manifold structures of Bounded Complex Domains and their Shilov Boundaries
and
Wyler's techniques allow calculation of Particle Masses and Force Strengths
(Smith, viXra 1602.0319)

Results of such calculations are shown in the Technical Endnotes:

Technical Endnotes:

Results of Calculations:

Quark masses are constituent masses. Most of the calculations are tree-level.
Fermions are Schwinger Sources with geometry of Complex Bounded Domains
and Kerr-Newman Black Hole structure size about 10^(-24) cm.
Since ratios are calculated, values for one particle mass and one force strength are assumed.

Particle/Force	Tree-Level	Higher-Order
e-neutrino	0	0 for nu_1
mu-neutrino	0	9 x 10^(-3) eV for nu_2
tau-neutrino	0	5.4 x 10^(-2) eV for nu_3
electron	0.5110 MeV	
down quark	312.8 MeV	charged pion = 139 MeV
up quark	312.8 MeV	proton = 938.25 MeV
		neutron - proton = 1.1 MeV
muon	104.8 MeV	106.2 MeV
strange quark	625 MeV	
charm quark	2090 MeV	
tauon	1.88 GeV	
beauty quark	5.63 GeV	
truth quark (low state)	130 GeV	(middle state) 174 GeV
		(high state) 218 GeV
W+	80.326 GeV	
W-	80.326 GeV	
W0	98.379 GeV	Z0 = 91.862 GeV
Mplanck 1.217x10^19 GeV		
Higgs VEV (assumed)	252.5 GeV	
Higgs (low state)	126 GeV	(middle state) 182 GeV
		(high state) 239 GeV
Gravity Gg (assumed)	1	
(Gg)(Mproton^2 / Mplanck^2)		5 x 10^(-39)
EM fine structure	1/137.03608	
Weak Gw	0.2535	
Gw(Mproton^2 / (Mw+^2 + Mw-^2 + Mz0^2))		1.05 x 10^(-5)
Color Force at 0.245 GeV	0.6286	0.106 at 91 GeV

Kobayashi-Maskawa parameters for W+ and W- processes are:

	d	s	b
u	0.975	0.222	0.00249 -0.00388i
c	-0.222 -0.000161i	0.974 -0.0000365i	0.0423
t	0.00698 -0.00378i	-0.0418 -0.00086i	0.999

The phase angle d13 is taken to be 1 radian.

Dark Energy : Dark Matter : Ordinary Matter = 0.75 : 0.21 : 0.04

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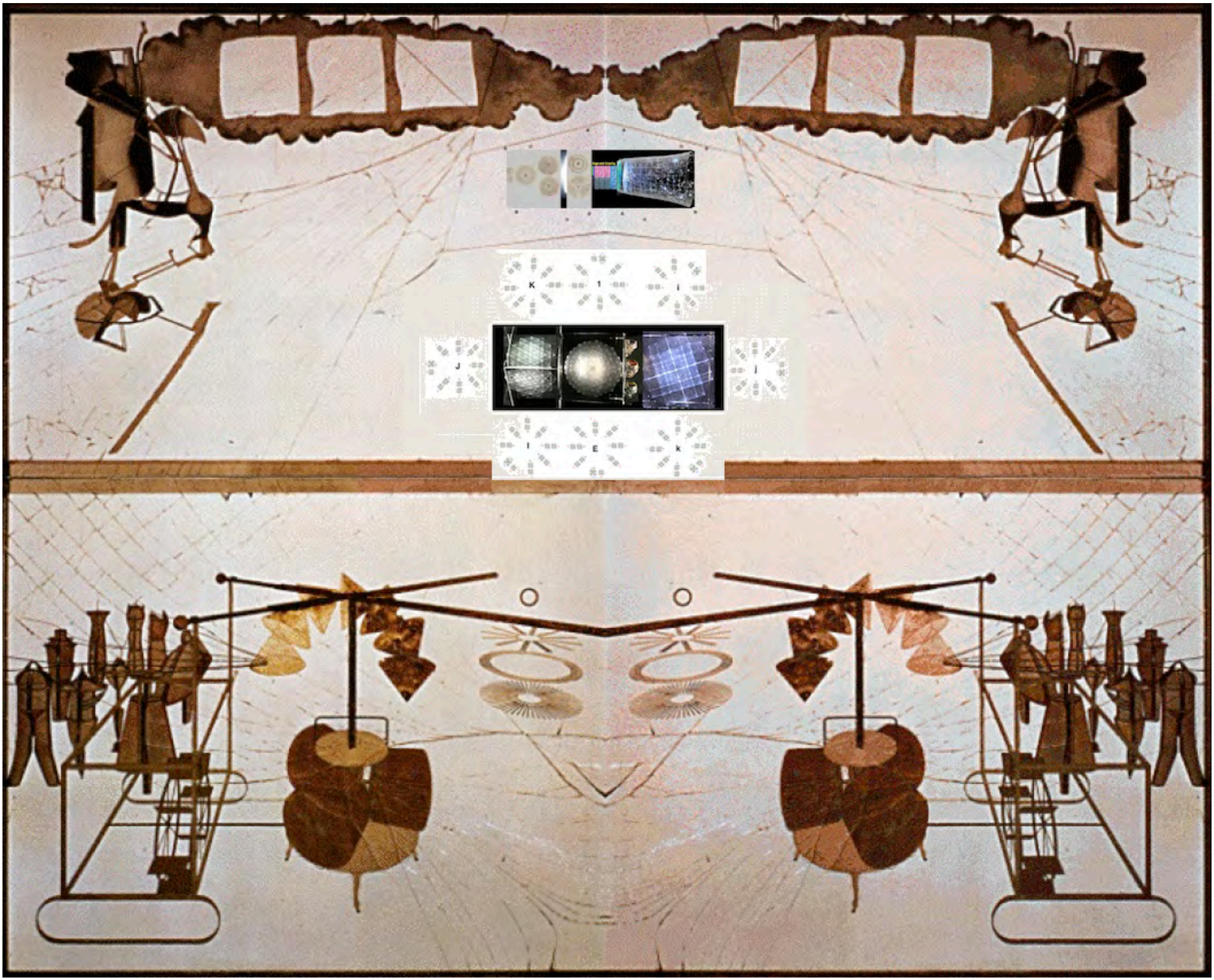
Wyler, 1971 - C. R. Acad. Sc. Paris, t. 271, 186-188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1
i
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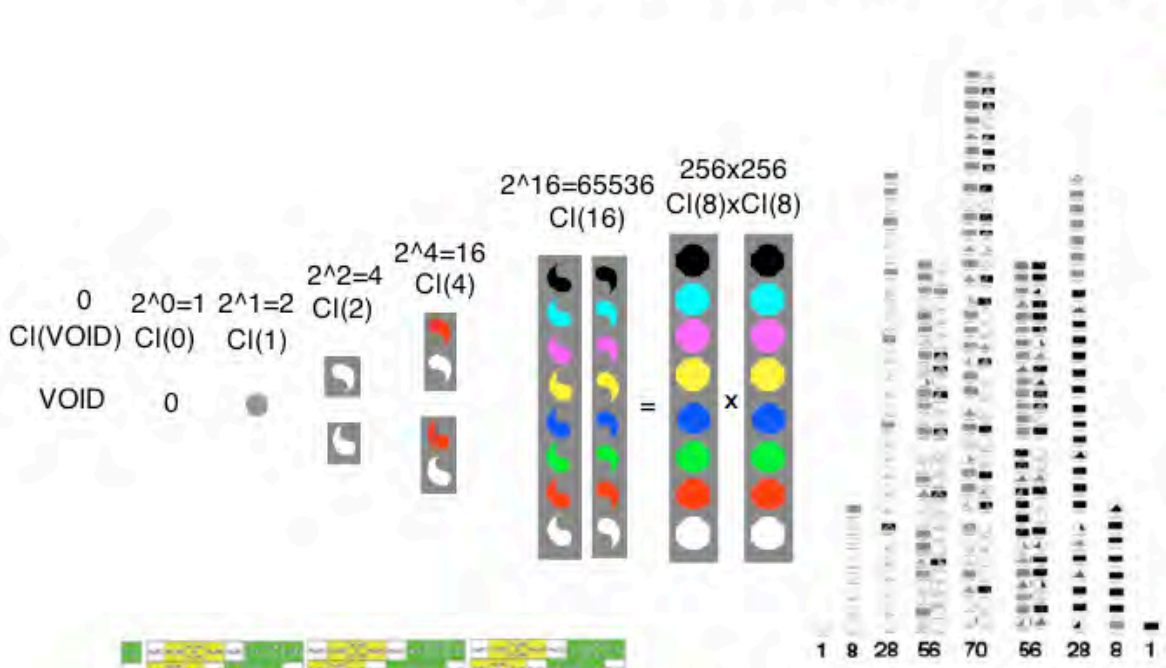
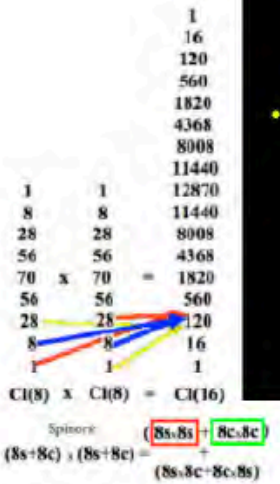
Dimension of Clifford Algebra						
0	2^0=1	2^1=2	2^2=4	2^4=16	2^16=65536	256x256

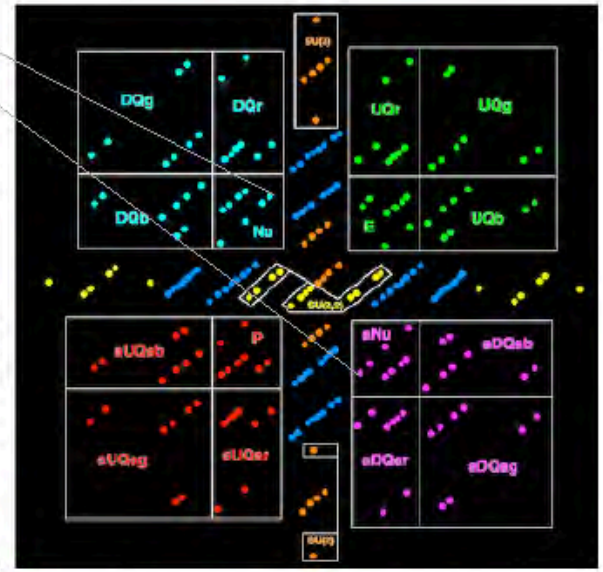
VOID -> Cl(VOID) -> Cl(0,0) -> Cl(0,1)-> Cl(0,2) -> Cl(0,4) -> Cl(0,16) = Cl(0,8)xCl(0,8) --> Cl(0,16)xCl(0,8) = Cl(0,24) -> M(2,Cl(0,24)) = Cl(1,25) ->

-> Completion of Union of All Tensor Products of Cl(1,25) = hyperfinite AQFT

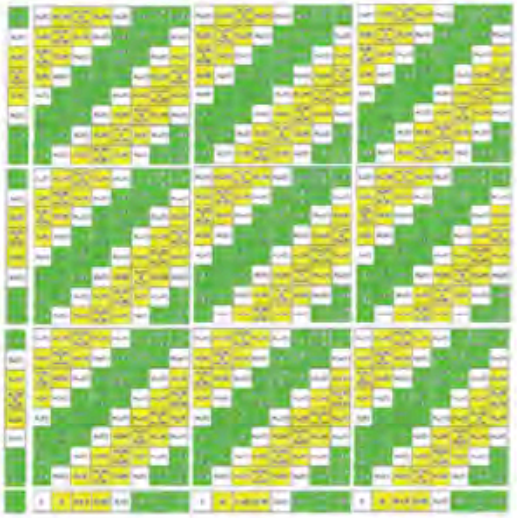
Cl(1,25) = Cl(1,9)xCl(0,8)xCl(0,8) and Cl(1,9) = Cl(1,5) x Cl(0,4) = Cl(2,4) x Cl(0,4)







Cl(16) contains 120 + 64 + 64 = 248 = E8
with 112 + 128 = 240 root vectors



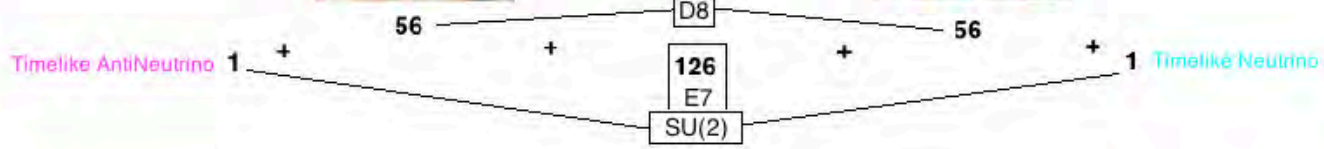
The completion of the union of all tensor products of Cl(16) = Cl(8)xCl(8) produces a generalized Hyperfinite II1 von Neumann factor that gives the Cl(16)-E8 model a natural Algebraic Quantum Field Theory

The Cl(16)-E8 AQFT inherits structure from the Cl(16)-E8 Local Lagrangian

The Creation-Annihilation Operator structure of Cl(16)-E8 AQFT is given by the Maximal Contraction of E8 = semidirect product A7 x h92
where h92 = 92+1+92 = 185-dim Heisenberg algebra and A7 = 63-dim SL(8)

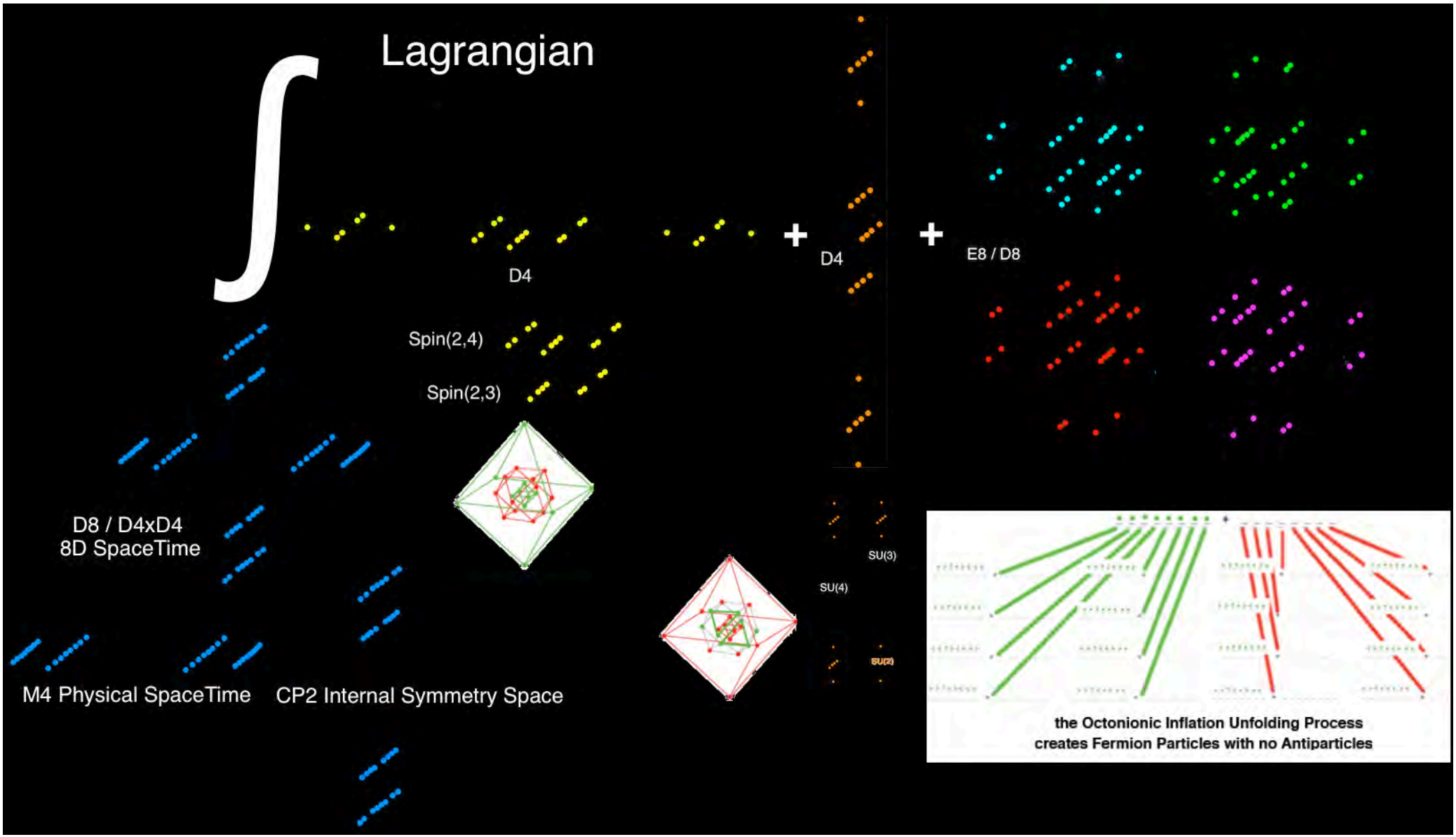
240 E8 Root Vectors

112 = 56 + 56 = (24+32) + (24-32)
128 = 1+126+1



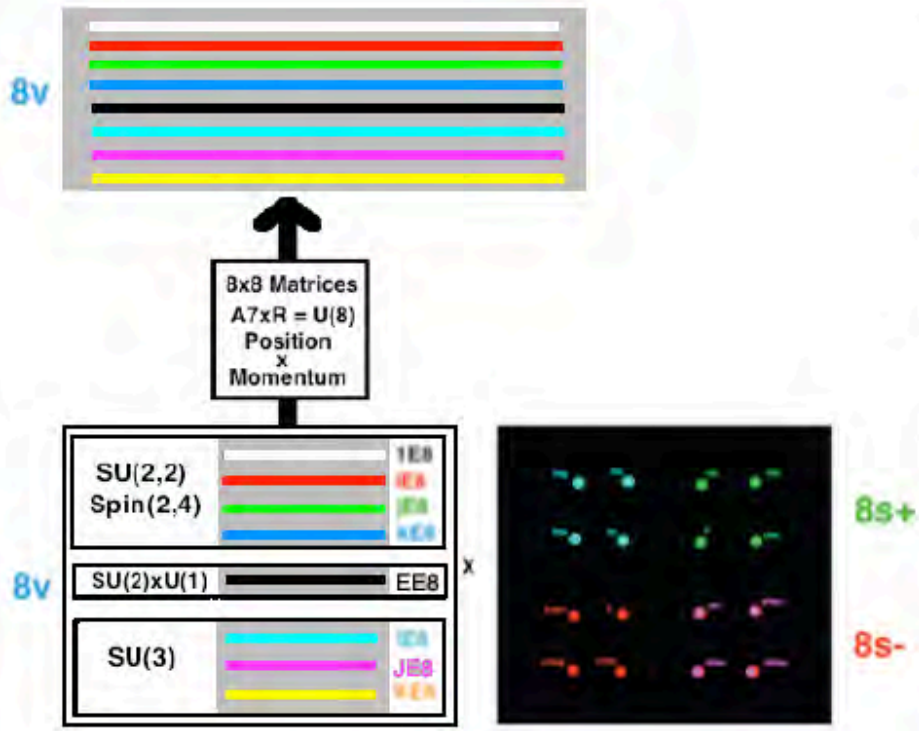
January 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 New Year's Day	2	3	4	5	6
7	8	9	10	11	12	13
14	15 Martin Luther King, Jr. Day	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			


Lagrangian
D4
D4
E8 / D8
Spin(2,4)
Spin(2,3)
D8 / D4xD4
8D SpaceTime
SU(3)
SU(4)
SU(2)
M4 Physical SpaceTime
CP2 Internal Symmetry Space
the Octonionic Inflation Unfolding Process
creates Fermion Particles with no Antiparticles

February 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 Groundhog Day	3
4	5	6	7	8	9	10
11	12 Lincoln's Birthday	13	14 St. Valentine's Day Ash Wednesday	15	16 Chinese New Year	17
18	19 President's Day	20	21	22	23	24
25	26	27	28 Purim			



Indra's Net of Schwinger Sources - Bohm Quantum Blockchain

The Cl(16)-E8 AQFT inherits structure from the Cl(16)-E8 Local Lagrangian

$\int$ Standard Model Gauge Gravity + Fermion Particle-AntiParticle

8-dim SpaceTime

the Cl(16)-E8 model at the Planck Scale has spacetime condensing out of Clifford structures forming a Leech lattice underlying 26-dim String Theory of World-Lines with 8 + 8 + 8 = 24-dim of fermion particles and antiparticles and of spacetime.

Slices of 8v SpaceTime are represented as D8 branes. Each D8 brane has Planck-Scale Lattice Structure superpositions of 8 types of E8 Lattice denoted by 1E8, iE8, jE8, kE8, EE8, IE8, JE8, KE8

Stack D8 branes to get SpaceTime with Strings = World-Lines

Let Oct16 = discrete mutiplicative group { +/-1, +/-i, +/-j, +/-k, +/-E, +/-I, +/-J, +/-K}.
Orbifold by Oct16 the 8s+ to get 8 Fermion Particle Types
Orbifold by Oct16 the 8s- to get 8 Fermion AntiParticle Types

Gauge Bosons from 1E8 and EE8 parts of a D8 give U(2) Electroweak Force
Gauge Bosons from IE8, JE8, and KE8 parts of a D8 give SU(3) Color Force
Gauge Bosons from 1E8, iE8, jE8, and kE8 parts of a D8 give U(2,2) Conformal Gravity

The 8x8 matrices for collective coordinates linking one D8 to the next D8 give Position x Momentum

The automorphism group of a single 26-dim String Theory cell modulo the Leech lattice is the Monster Group of order about 8 x 10^53.

When a fermion particle/antiparticle appearsTachyons create a cloud of particles/antiparticles. The cloud is one Planck-scale Fundamental Fermion Valence Particle plus an effectively neutral cloud of particle/antiparticle pairs forming a Kerr-Newman black hole. That cloud constitutes the Schwinger Source.

The Schwinger Sources are finite regions in a Complex Domain spacetime corresponding to Green's functions of particle creation / annihilation.

Its structure comes from the 24-dim Leech lattice part of the Monster Group which is 2^(1+24) times the double cover of Co1, for a total order of about 10^26.

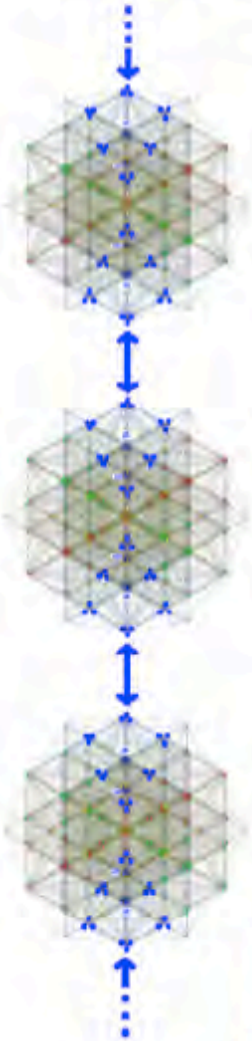
(Since a Leech lattice is based on copies of an E8 lattice and since there are 7 distinct E8 integral domain lattices there are 7 (or 8 if you include a non-integral domain E8 lattice)mdistinct Leech lattices. The physical Leech lattice is a superposition of them, effectively adding a factor of 8 to the order.)

The volume of the Kerr-Newman Cloud is on the order of 10^27 x Planck scale, = roughly 10^(-24) cm.

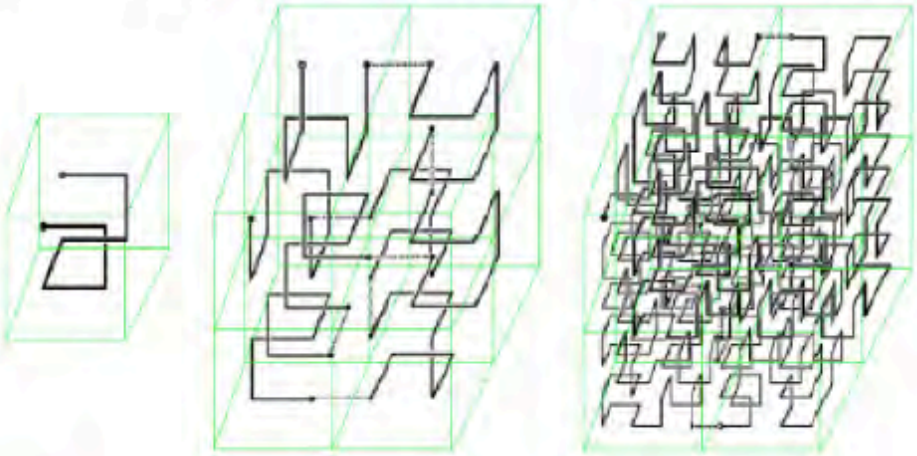
March 2018

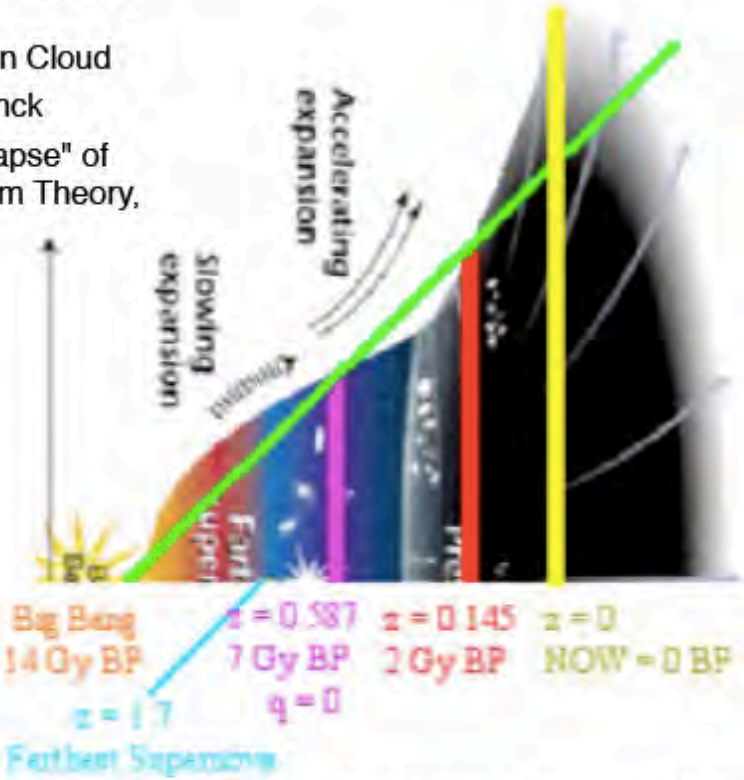
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11 Daylight Savings Begins	12	13	14	15	16	17 St. Patrick's Day
18	19	20 Spring Begins	21	22	23	24
25 Palm Sunday	26	27	28	29	30 Passover	31

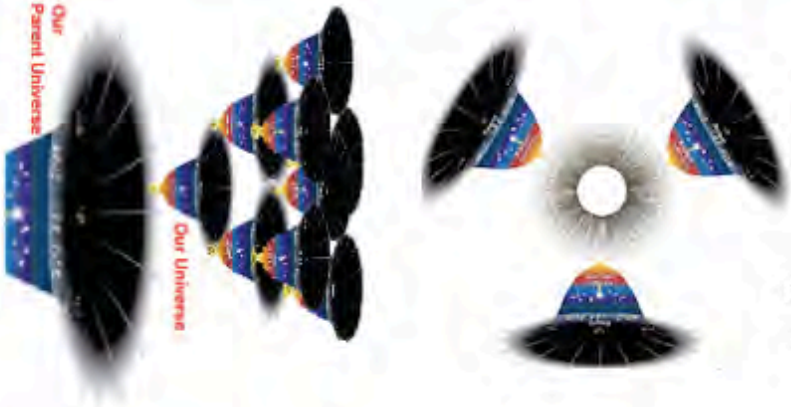
Big Bang E8(-248) : Spin(16) | Octonion Inflation E8(8) : SO(8,8) | Quaternion Conformal Evolution E8(-24) : SO*(16)



At the end of Non-Unitary Octonionic Inflation Our Universe
had about (1/2) 16^64 = (1/2) (2^4)^64 = 2^255 = 6 x 10^76 Fermion Particles
the size of our Universe was then about 10^(-24) cm
which is about the size of a Fermion Schwinger Source Kerr-Newman Cloud
The End of Inflation time was at about 10^(-34) sec = 2^64 Tplanck
The Zizzi Inflation phase of our universe ends with decoherence "collapse" of
the 2^64 Superposition Inflated Universe into Many Worlds of Quantum Theory,







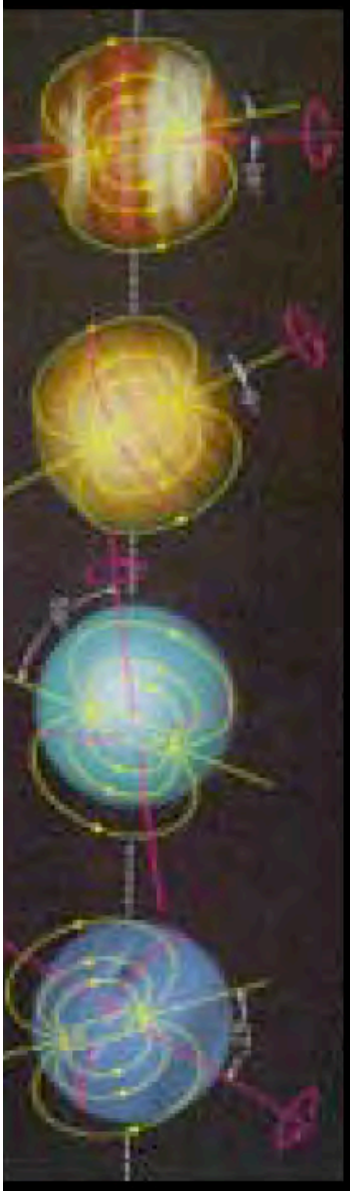
The ratio Dark Energy : Dark Matter : Ordinary Matter
for our Universe at the present time is calculated to be:
0.75 : 0.21 : 0.04

Paola Zizzi in gr-qc/0007006:
"... **The self-reduction of the superposed quantum state ...**
corresponds to a superposed state of ... [10^19 = 2^64 qubits]
... also the number of superposed tubulins-qubits in our brain
... leading to a conscious event. ...".

April 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 April Fool's Day Easter Sunday	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22 Earth Day	23	24	25	26	27	28
29	30					

CONFORMAL
KEPLER



0.72 AU
VENUS

MERCURY
0.39 AU

Octahedron
1 : sqrt(3)
1 : 1.7321

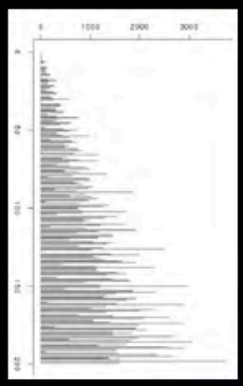
1 AU
MOON

EARTH

Icosahedron
1 : sqrt(15-6sqrt(5))
1 : 1.2584

Dodecahedron

MARS
1.52 AU



Tetrahedron
1 : 3

SelfDual

5.20 AU
JUPITER

Cuboctahedron
1 : 2
(square face inscribed radius)

Cube
1 : sqrt(3)
1 : 1.7321

SATURN
9.54 AU

Cuboctahedron
D3 Root Vectors
Conformal SU(2,2) =
= Spin(2,4)

NEPTUNE
30.06 AU

URANUS
19.19 AU

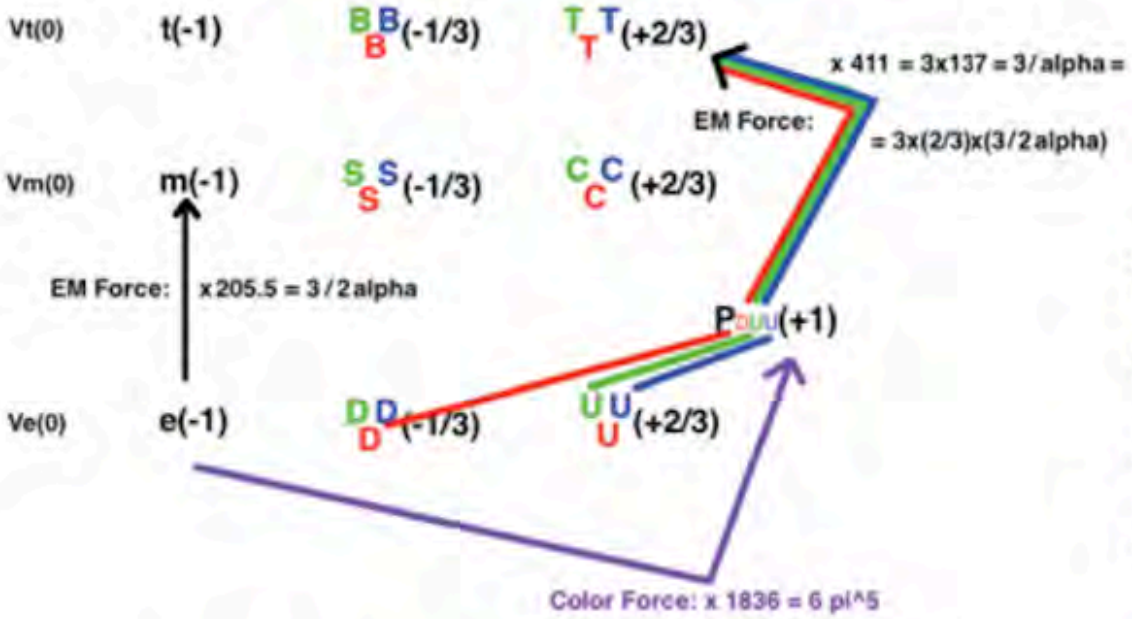
Pioneer
Anomaly
20 AU

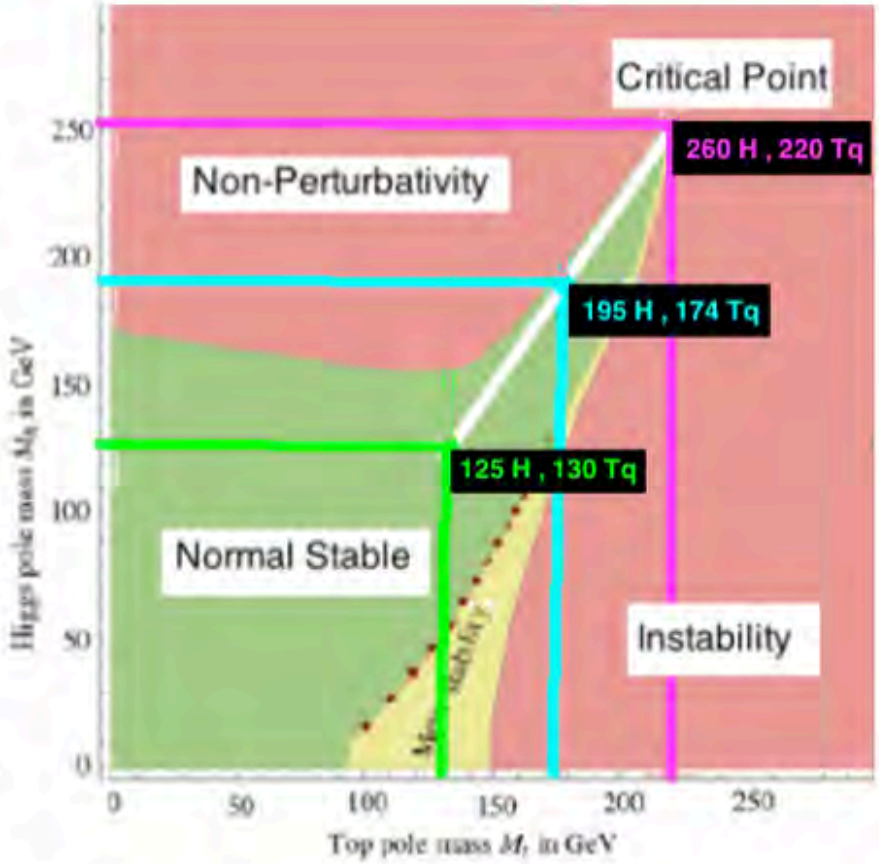
Rhombic Dodecahedron
1 : sqrt(2)
1 : 1.4142

Cuboctahedron and Rhombic Dodecahedron
are 3-dim central figures of the 4-dim 24-cell

May 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 May Day	2	3	4	5 Cinco de Mayo
6	7	8	9	10	11	12
13 Mother's Day	14	15	16	17	18	19 Shavuot Begins Sundown
20	21 Victoria Day	22	23	24	25	26
27	28 Memorial Day	29	30	31		





The Schwinger Sources are finite regions in a Complex Domain spacetime corresponding to Green's functions of particle creation / annihilation.

The force strength of a given force is

(1 / Mforce^2) (Vol(MISforce)) (Vol(Qforce) / Vol(Dforce)^(1 / mforce))

Mforce represents the effective mass;

mforce is 4 for Gravity and Color force, 2 for Weak force 1 for Electromagnetism

Vol(Dforce)^(1 / mforce) is to reconcile

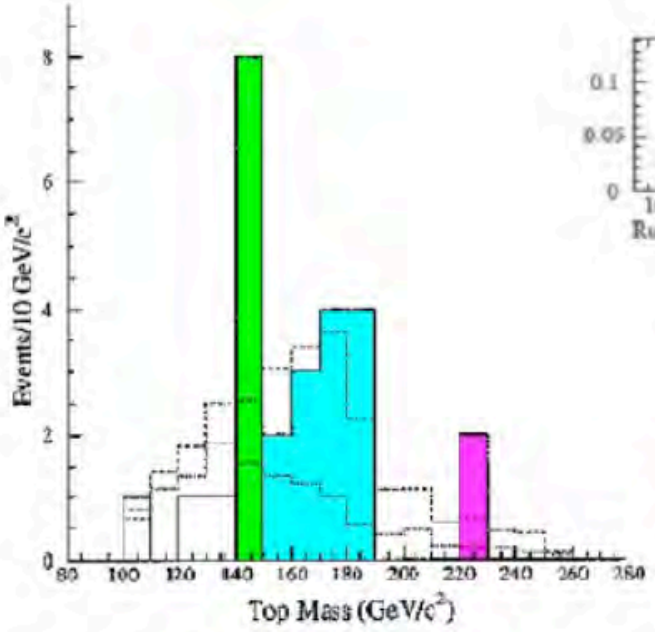
the dimensionality of the Internal Symmetry Space of the target vertex

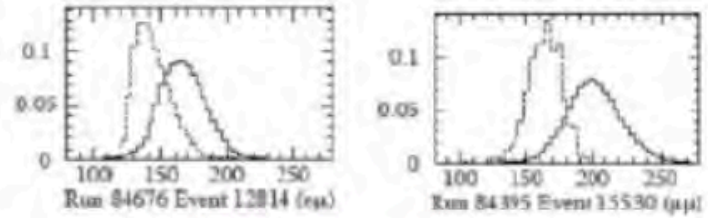
with the dimensionality of the link from the origin to the target vertex

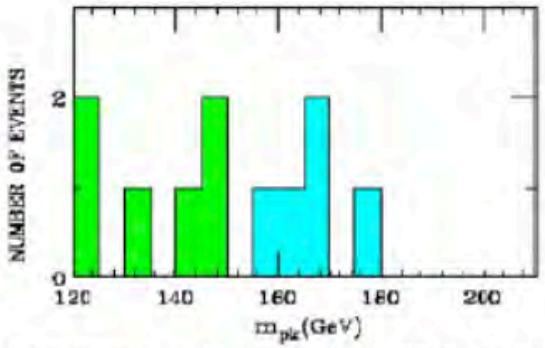
Force	M	Vol(M)	Group	SymSpace	D	Vol(D)	Q	Vol(Q)
gravity	S^4	8pi^2/3	Spin(5)	Spin(7) / Spin(5)xU(1)	IV5	pi^5/2^4 5!	RP^1xS^4	8pi^3/3
color	CP^2	8pi^2/3	SU(3)	SU(4) / SU(3)xU(1)	B^6(ball)	pi^3/6	S^5	4pi^3
Weak	S^2xS^2	2x4pi	SU(2)	Spin(5) / SU(2)xU(1)	IV3	pi^3/24	RP^1xS^2	4pi^2
e-mag	T^4	4x2pi	U(1)	-	-	-	-	-

June 2018

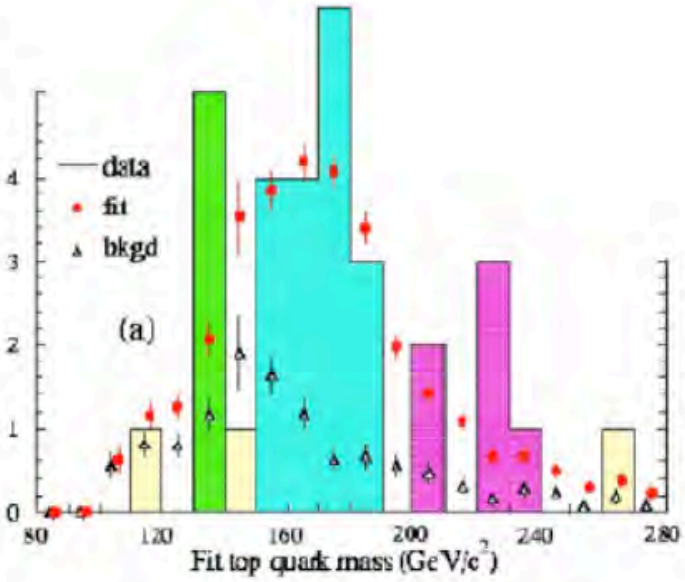
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14 Flag Day	15	16
17 Father's Day	18	19	20	21 Summer Begins	22	23
24	25	26	27	28	29	30

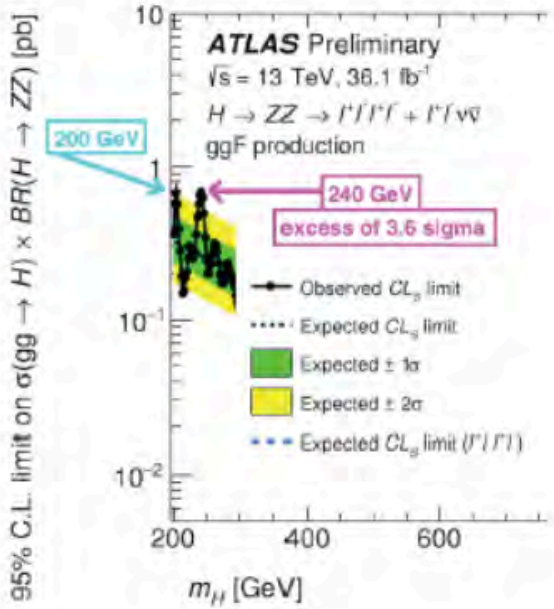


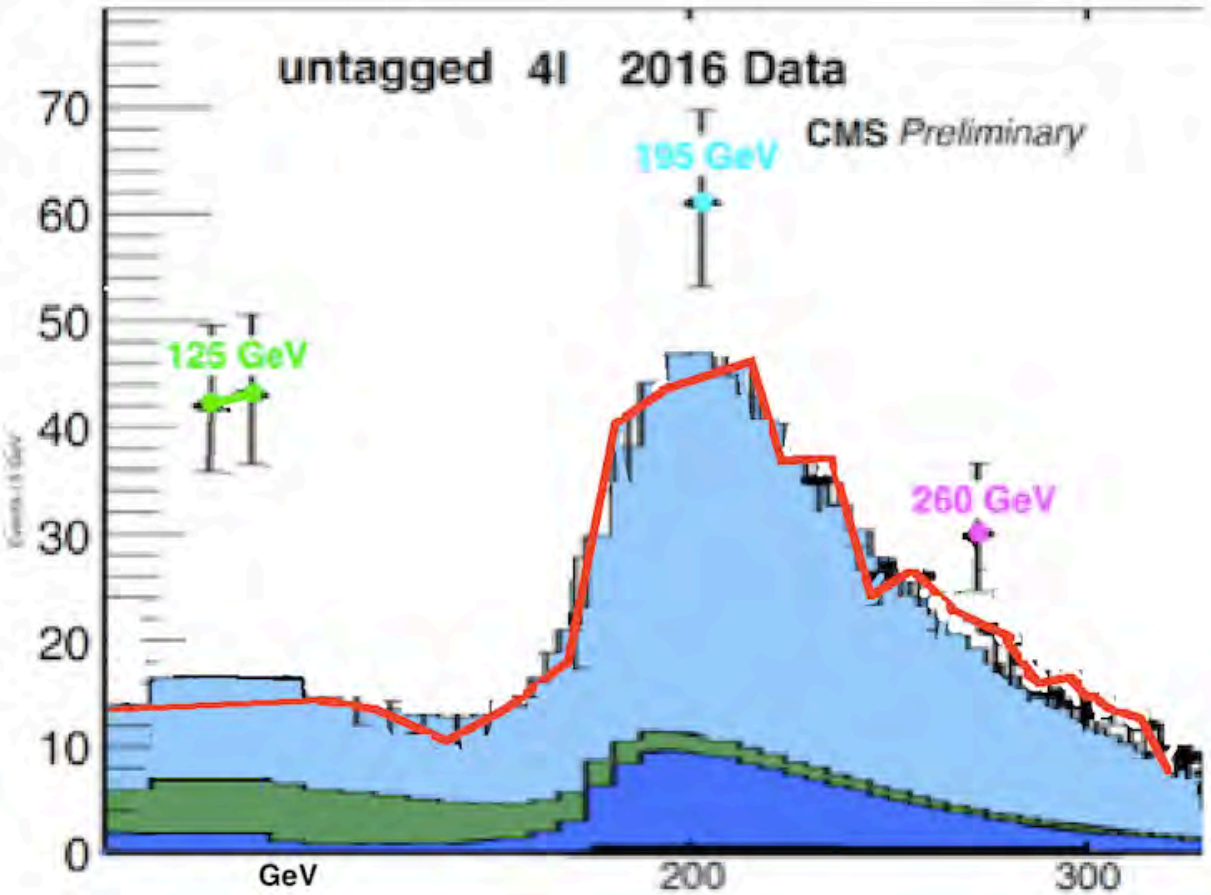




The distribution of m_{pole} values determined from 11 CDF dilepton events



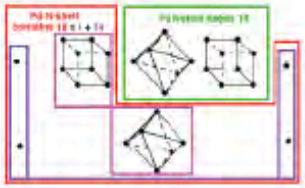




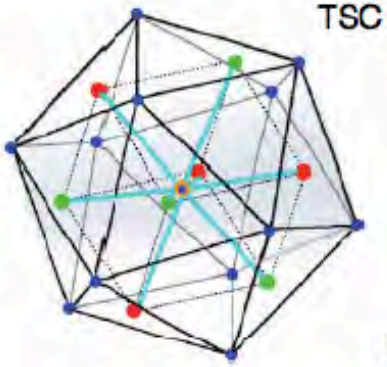
July 2018

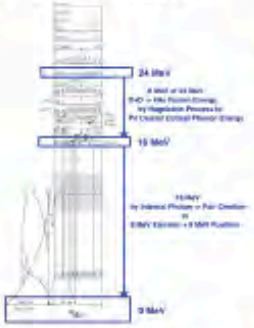
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Canada Day	2	3	4 Independence Day	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

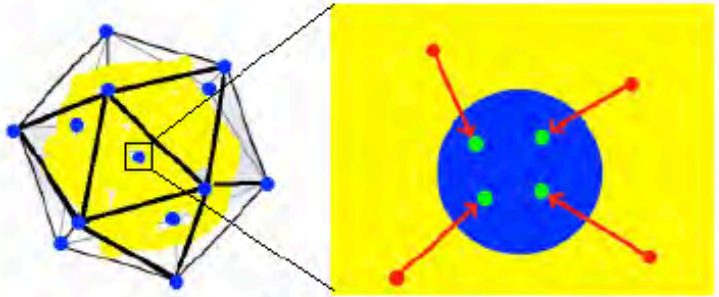
Schwinger Pd-D Zeolite Quantum Fusion Process:

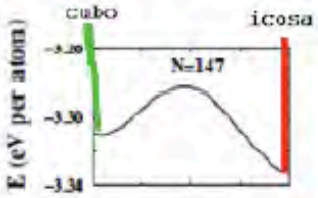


Akito Takahashi
TSC Pd-D Fusion

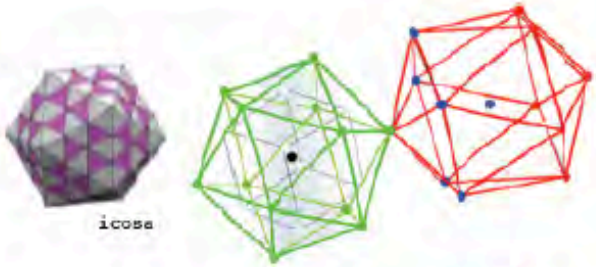


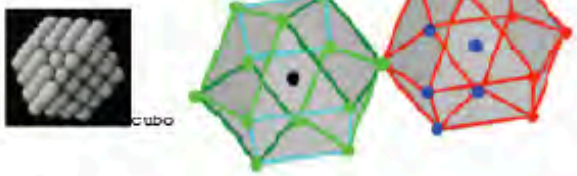






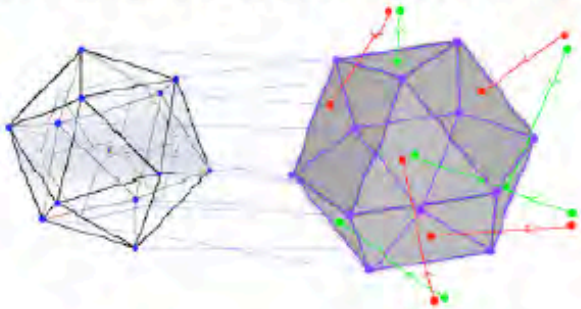
Sandia-UNM 147-atom Pd Clusters

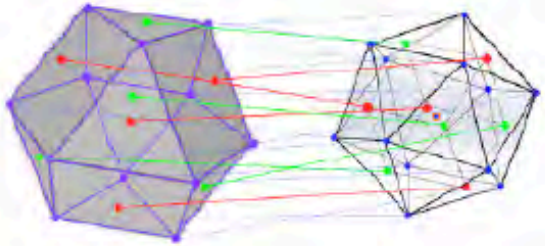


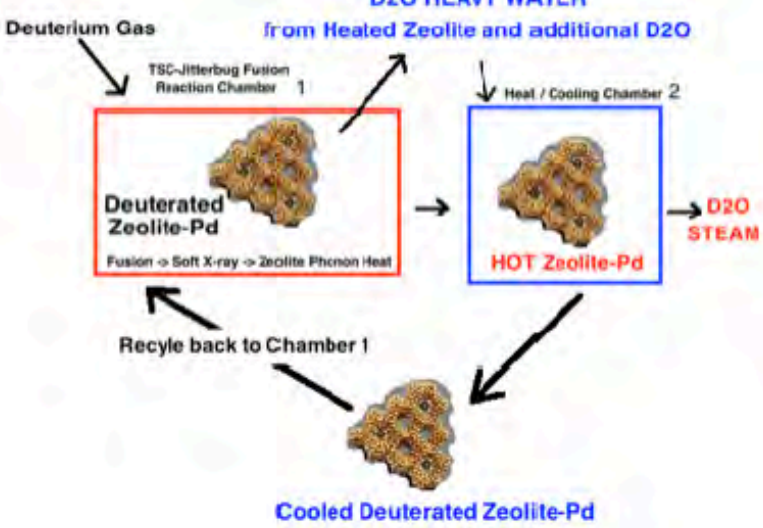


Peter Hagelstein Nuclear Energy to Pd Structure to Zeolite

Klee Irwin Jitterbug Eject He and Reload D







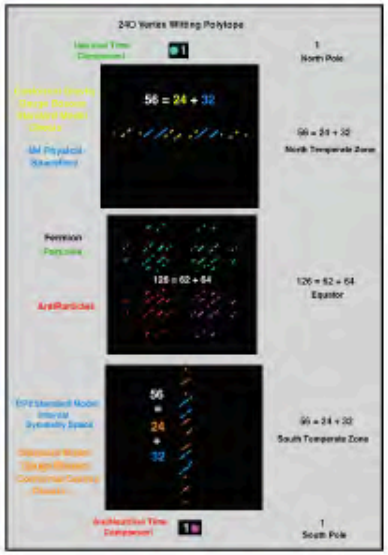
August 2018

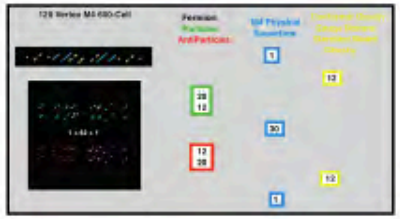
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

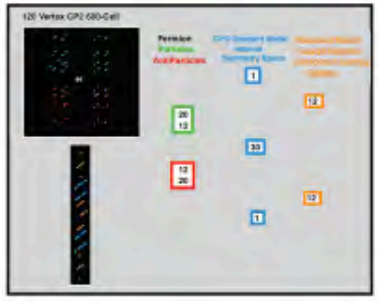
Each ORC State, analagous to a Possible Conscious Thought, is represented by a Chain of Local E8-Cl(16) Deutsch-type Multiverse Snapshots
Each of the Local E8-Cl(16) Multiverse Snapshots is described by an E8 State. Since E8 has 240 Root Vectors and
the 240 Root Vectors correspond to the 240-Polytope (see "Geometric Frustration" by Sadoc and Mosseri (Cambridge 2006) where they say

"The polytope 240 ...[is]... not a regular polytope ... but ... an ordered structure on a hypersphere ... S3 ... which is chiral ... generated by adding two replicas of the {3,3,5}, displaced along a screw axis of S3 ..."

each Local E8-Cl(16) Multiverse Snapshot is represented by a pair of {3,3,5} 600-cells.







Green, Schwartz, and Witten say in their book "Superstring Theory" vol. 1 (Cambridge 1986)
"... For the ... closed ... bosonic string ... The first excited level ... consists of ... the ground state ... tachyon ... and ... a scalar ... 'dilaton' ... and ... SO(24) ... little group of a ...[26-dim]... massless particle ... and ... a ... massless ... spin two state ...".

Closed string tachyons localized at orbifolds of fermions produce virtual clouds of particles / antiparticles that dress fermions.

Dilatons are Goldstone bosons of spontaneously broken scale invariance that (analagous to Higgs) go from mediating a long-range scalar gravity-type force to the nonlocality of the Bohm-Sarfatti Quantum Potential.

The SO(24) little group is related to the Monster automorphism group that is the symmetry of each cell of Planck scale local lattice structure.

The massless spin two state is the carrier of the Bohm-Sarfatti Quantum Potential.

Peter R. Holland says in his book "The Quantum Theory of Motion" (Cambridge 1993)
"... the total force ... from the quantum potential ... does not ... fall off with distance ... because ... the quantum potential ... depends on the form of ... [the quantum state]... rather than ... its ... magnitude ...".

First consider Superposition of States involving one tubulin with one electron of mass m and two different position states separated by a.
The Superposition Separation Energy Difference is the gravitational energy

E_electron = G m^2 / a

For any single given tubulin a = 1 nanometer = 10^(-7) cm so that for a single Electron

T = h / E_electron = (Comoton / Schwarzschild) (a / c) = 10^26 sec = 10^19 years

Now consider the case of N Tubulin Electrons in Coherent Superposition
Jack Sarfatti defines coherence length L by L^3 = N a^3 so that
the Superposition Energy E_N of N superposed Conformation Electrons is

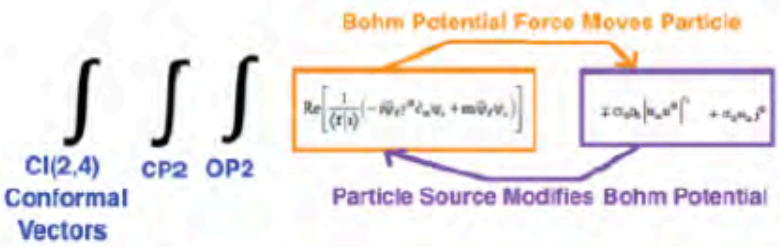
E_N = G M^2 / L = N^(5/3) E_electron

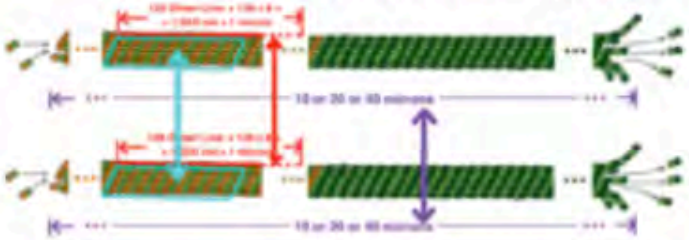
The decoherence time for the system of N Tubulin Electrons is

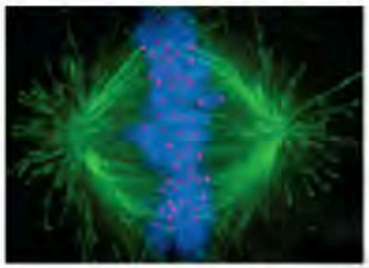
T_N = h / E_N = h / N^(5/3) E_electron = N^(-5/3) 10^26 sec

Number of Involved Tubulin Dimers	Time T_N	
10^(11+9) = 10^20	10^(-33 + 26) = 10^(-7) sec	10^11 neurons x 10^9 TD / neuron
10^16	10^(-27 + 26) = 10^(-1) sec - 10 Hz - Human Alpha EEG is 8 to 13 Hz -	

Fundamental Schumann Resonance is 7.8 Hz -
Time of Hamiltonian Circuit of 10^16 TD separated from nearest neighbors by 10 nm is 10^16 x 10 nm / c = (10^16 x 10^(-6)) cm / c = 10^10 cm / c = 0.3 sec -

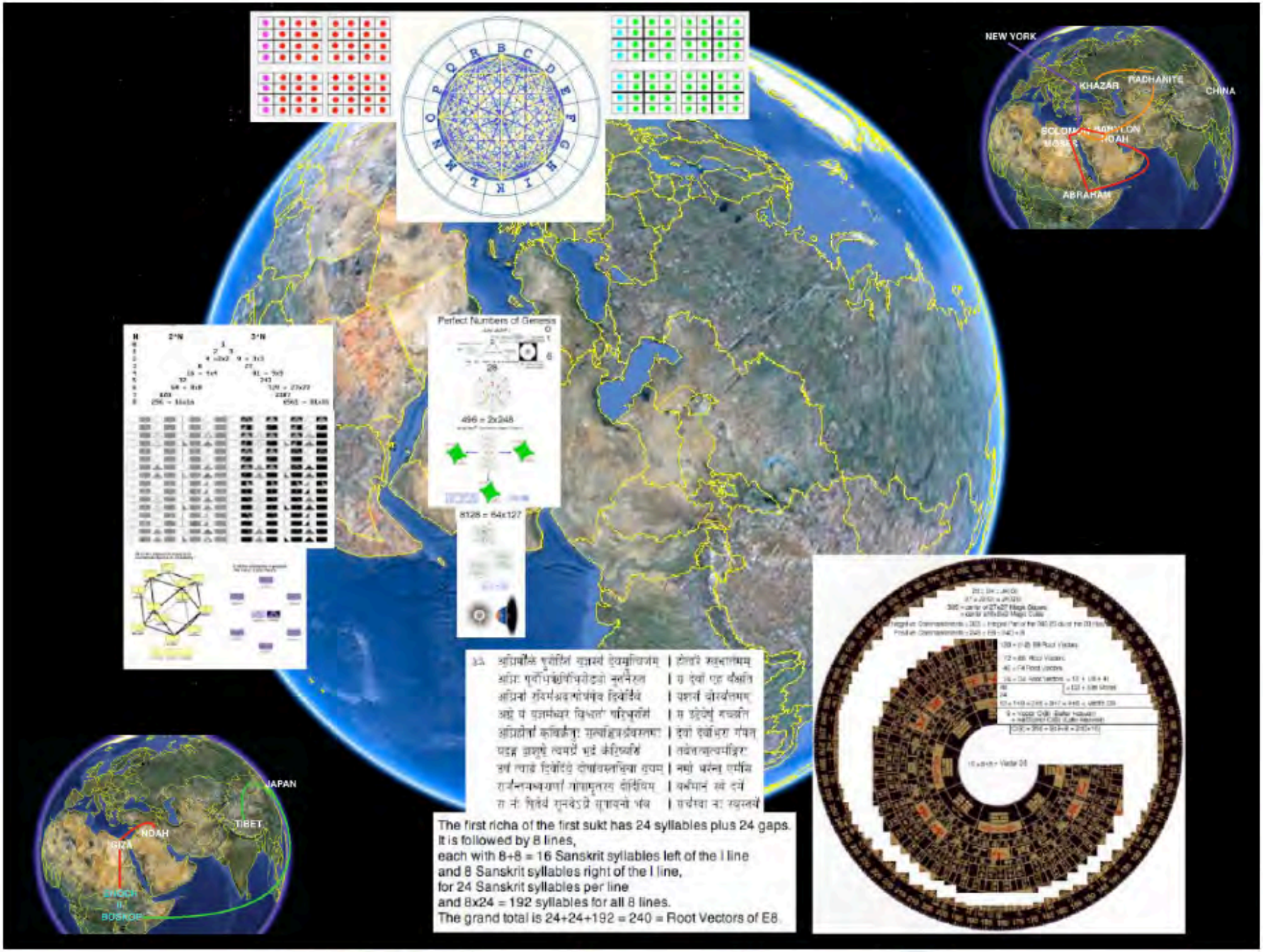






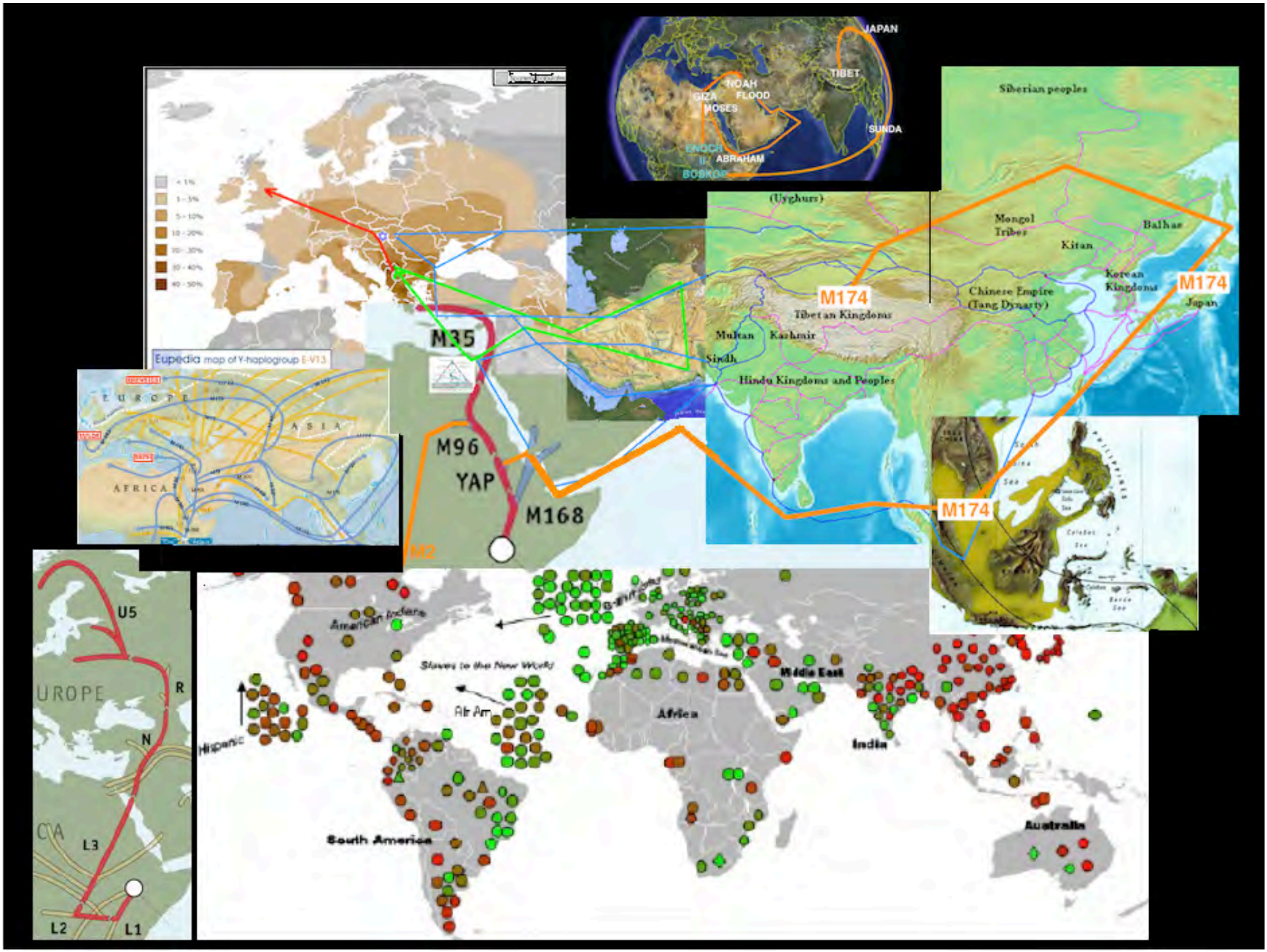
September 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 Labor Day	4	5	6	7	8
9 Grandparents Day Rosh Hashanah	10	11	12	13	14	15
16	17	18 Yom Kippur	19	20	21	22 Autumn Begins
23 30	24	25	26	27	28	29


NEW YORK
KHAZAR
RADHANITE
CHINA
ABRAHAM
Perfect Numbers of Genesis
496 = 2x248
8128 = 64x127
JAPAN
TIBET
NOAH
GIZA
ENOCH
BUSHOP
The first richa of the first sukt has 24 syllables plus 24 gaps.
It is followed by 8 lines,
each with 8+8 = 16 Sanskrit syllables left of the I line
and 8 Sanskrit syllables right of the I line,
for 24 Sanskrit syllables per line
and 8x24 = 192 syllables for all 8 lines.
The grand total is 24+24+192 = 240 = Root Vectors of E8.
50,000 years ago

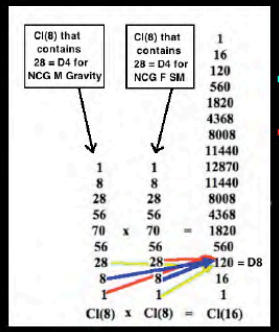
October 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8 Columbus Day	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31 Halloween			

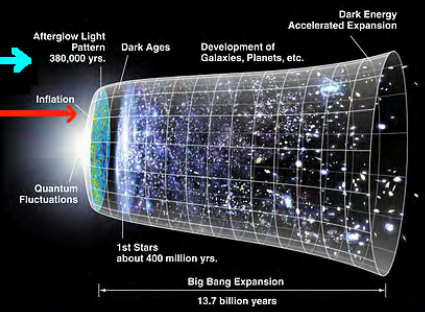

JAPAN
TIBET
NOAH
FLOOD
GIZA
MOSES
SUNDA
ENOCH
ABRAHAM
BOSKOP
Siberian peoples
(Uyghurs)
Mongol Tribes
Balhae
Kitan
Korean Kingdoms
Chinese Empire (Tang Dynasty)
M174
Tibetan Kingdoms
Multan
Kashmir
Sindh
Hindu Kingdoms and Peoples
M174
Japan
M174
M35
M96
YAP
M168
M2
Eupedia map of Y-haplogroup E-V13
EUROPE
ASIA
AFRICA
U5
R
N
L3
L2
L1
American Indians
Slaves to the New World
Hispanic
Middle East
Africa
India
South America
Australia

November 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4 Daylight Savings Ends	5	6	7	8	9	10
11 Veterans Day	12 Veterans Day (Observed)	13	14	15	16	17
18	19	20	21	22 Thanksgiving	23	24
25	26	27	28	29	30	

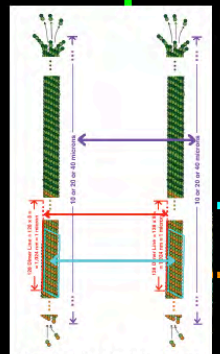


NJL Quantum Condensate



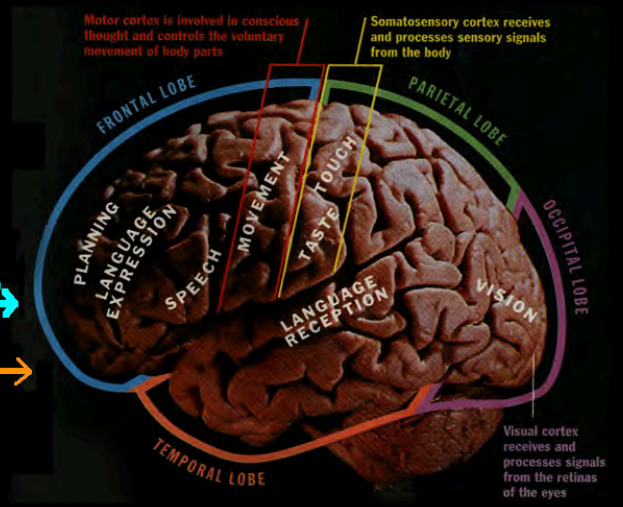
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation

Quantum Resonant Connection



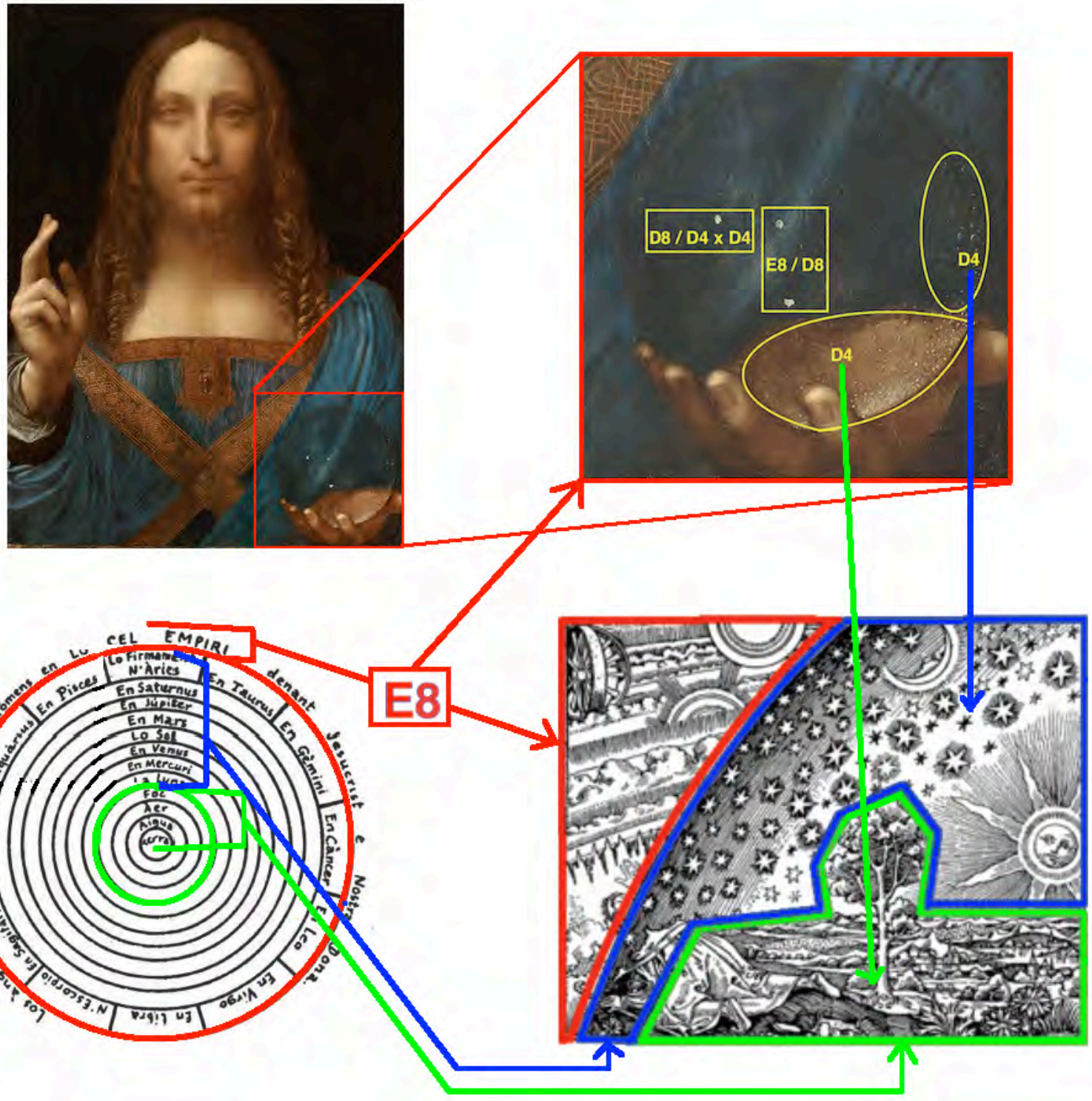
Penrose-Hameroff Quantum Condensate

10^19 Tubulin Dimers in a Human Brain



December 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2 Hanukkah	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21 Winter Begins	22
23 30	24 New Year's Eve 31	25 Christmas Day	26 Kwanzaa	27	28	29


D8 / D4 x D4
E8 / D8
D4
D4
E8
EMPIRI
En Taurus
En Gèmini
En Càncer
En Leo
En Virgo
En Libra
En Escorpio
En Sagitari
En Capricornus
En Aquàrius
En Pisces
N'Àries
En Saturnus
En Júpiter
En Mart
Lo Sol
En Venus
En Mercuri
Foc
Aer
Aigua
Terra

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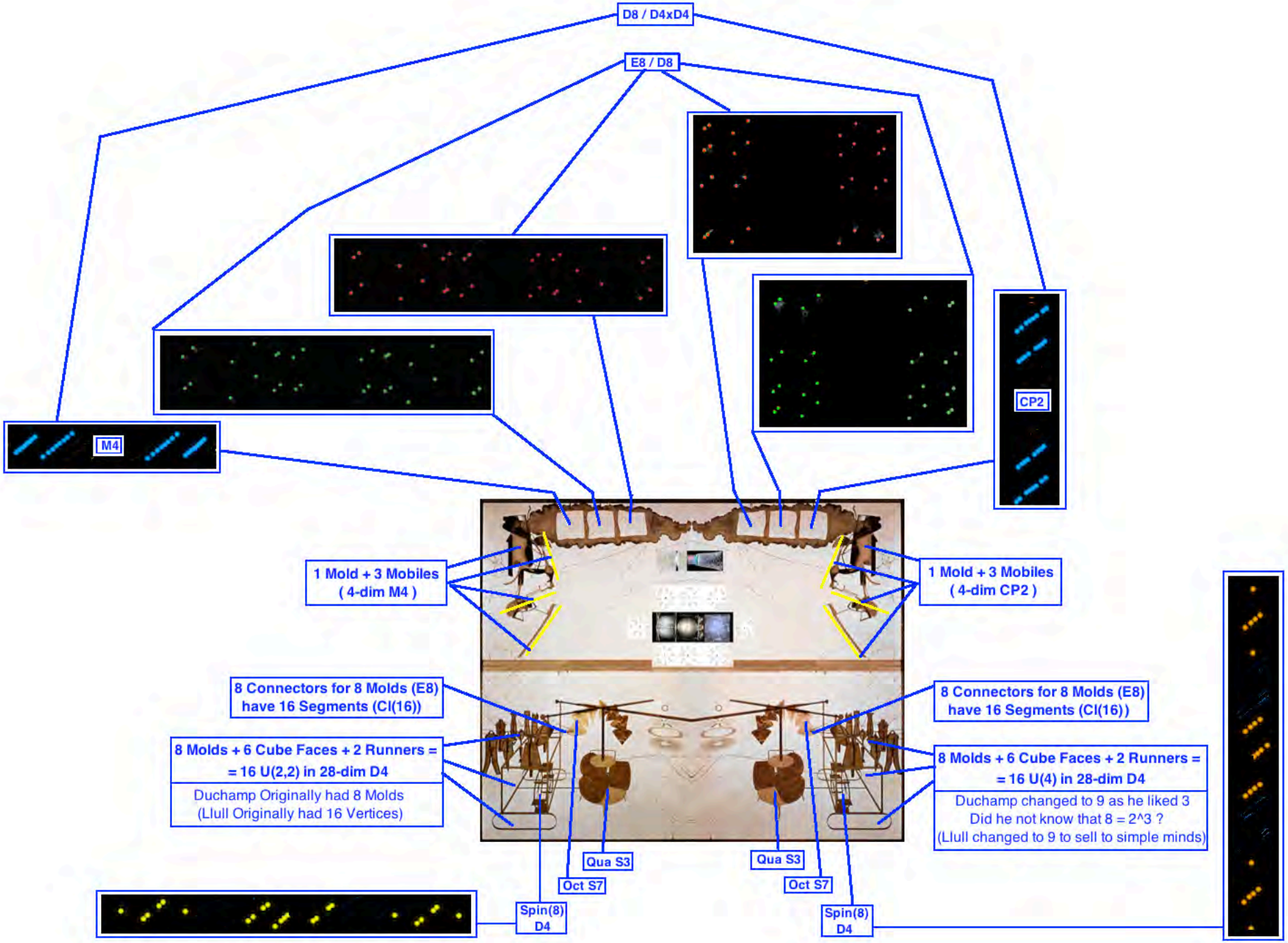
January 2019 (United States)

February 2019

S	M	T	W	T	F	S
					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		

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1 New Year's Day	2	3	4	5 ● New Moon
6	7	8	9	10	11	12
13	14 ◐ 1st Quarter	15	16	17	18	19
20	21 Martin Luther King Jr. Day Tu Bishvat/Tu B'Shevat ○ Full Moon	22	23	24	25	26
27 ◑ 3rd Quarter	28	29	30	31	1	2


D8 / D4xD4
E8 / D8
M4
CP2
1 Mold + 3 Mobiles
(4-dim M4)
1 Mold + 3 Mobiles
(4-dim CP2)
8 Connectors for 8 Molds (E8)
have 16 Segments (Cl(16))
8 Molds + 6 Cube Faces + 2 Runners =
= 16 U(2,2) in 28-dim D4
Duchamp Originally had 8 Molds
(Llull Originally had 16 Vertices)
8 Connectors for 8 Molds (E8)
have 16 Segments (Cl(16))
8 Molds + 6 Cube Faces + 2 Runners =
= 16 U(4) in 28-dim D4
Duchamp changed to 9 as he liked 3
Did he not know that 8 = 2^3 ?
(Llull changed to 9 to sell to simple minds)
Qua S3
Oct S7
Spin(8)
D4
Qua S3
Oct S7
Spin(8)
D4

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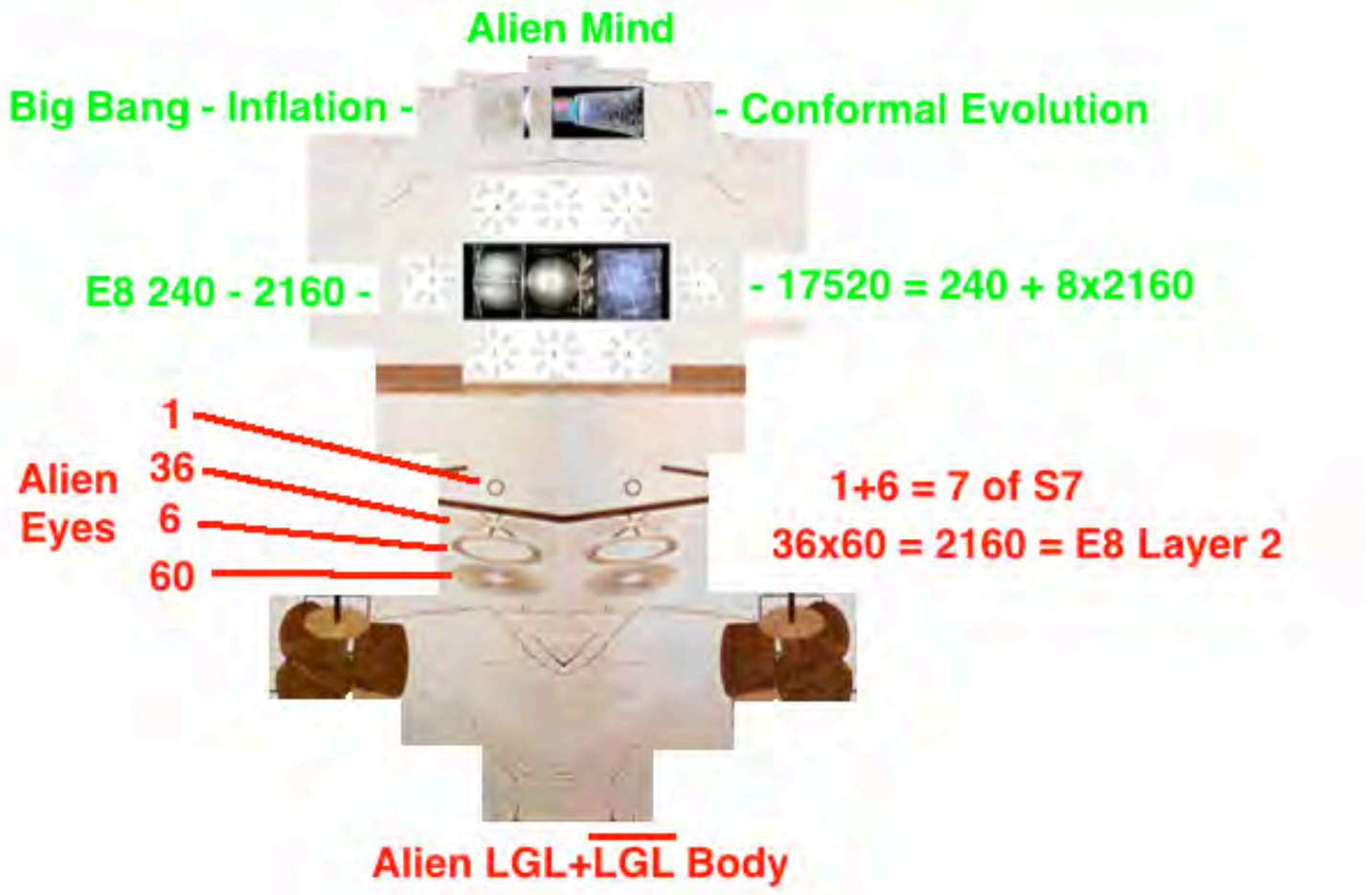
February 2019 (United States)

March 2019

S	M	T	W	T	F	S
					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						

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27 3rd Quarter	28	29	30	31	1	2
3	4 New Moon	5	6	7	8	9
10	11	12 1st Quarter	13	14	15	16
17	18 Presidents' Day	19 Full Moon	20	21	22	23
24	25	26 3rd Quarter	27	28	1	2


Alien Mind
Big Bang - Inflation -
- Conformal Evolution
E8 240 - 2160 -
- 17520 = 240 + 8x2160
1
Alien 36
Eyes 6
60
1+6 = 7 of S7
36x60 = 2160 = E8 Layer 2
Alien LGL+LGL Body

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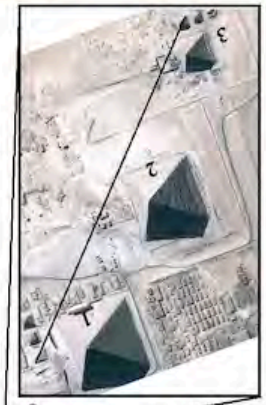
March 2019 (United States)

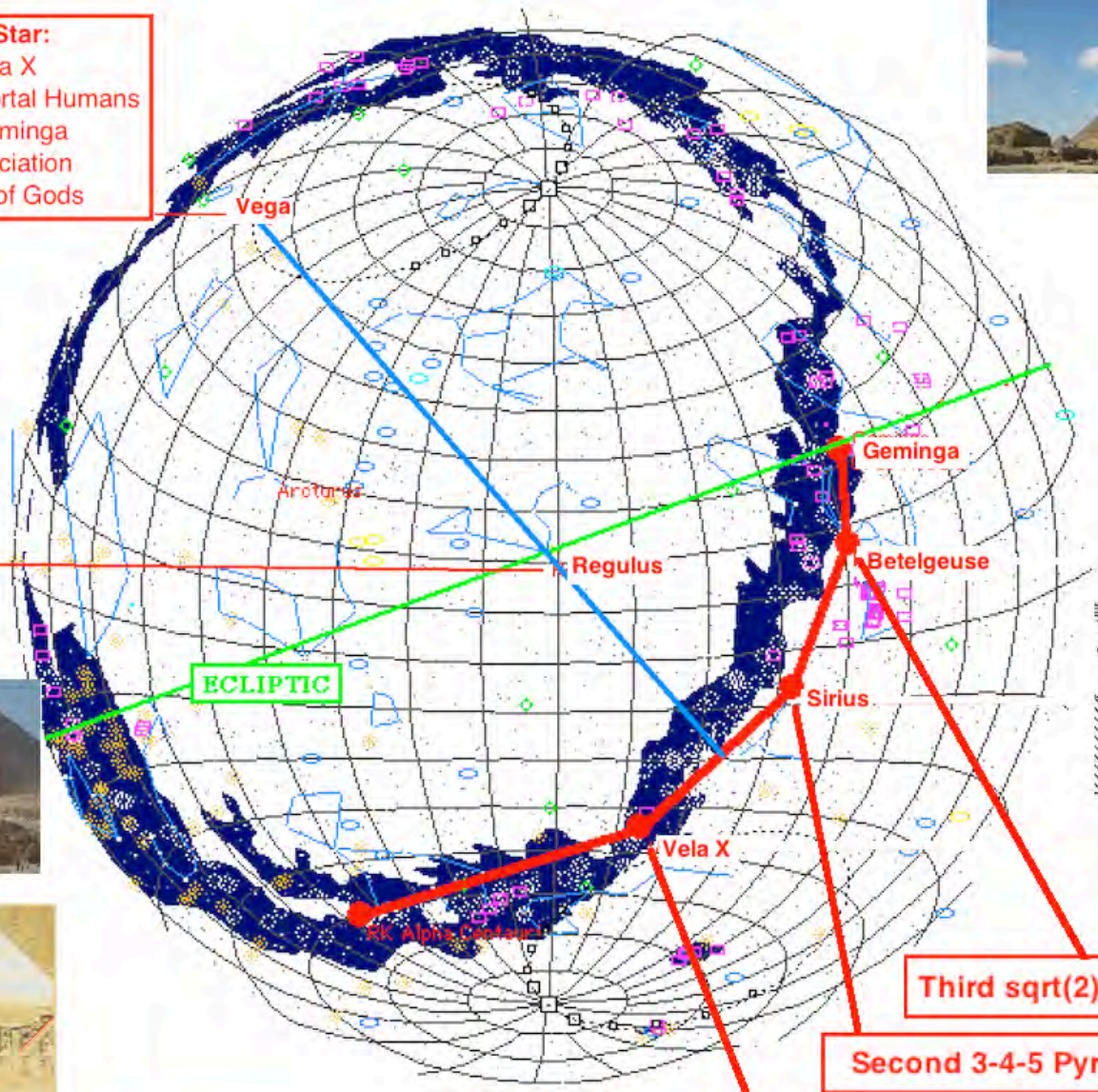
April 2019

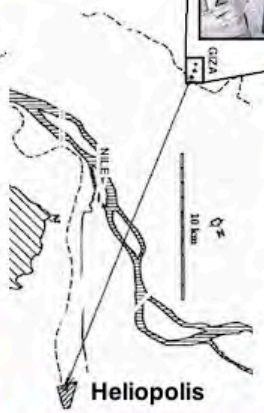
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Sun	Mon	Tue	Wed	Thu	Fri	Sat
24	25	26 3rd Quarter	27	28	1	2
3	4	5	6 New Moon	7	8	9
10	11	12	13	14 1st Quarter	15	16
17	18	19	20 March equinox Full Moon	21 Purim	22	23
24	25	26	27	28 3rd Quarter	29	30
31	1	2	3 Isra and Mi'raj	4	5 New Moon	6

Vega = North Star:
11600 BP - Vela X
Manetho Rule of Mortal Humans
37000 BP - Geminga
Wisconsin Glaciation
Manetho Rule of Gods







Third sqrt(2) x 10/9 Pyramid

Second 3-4-5 Pyramid

Great Golden Cl(8) Pyramid

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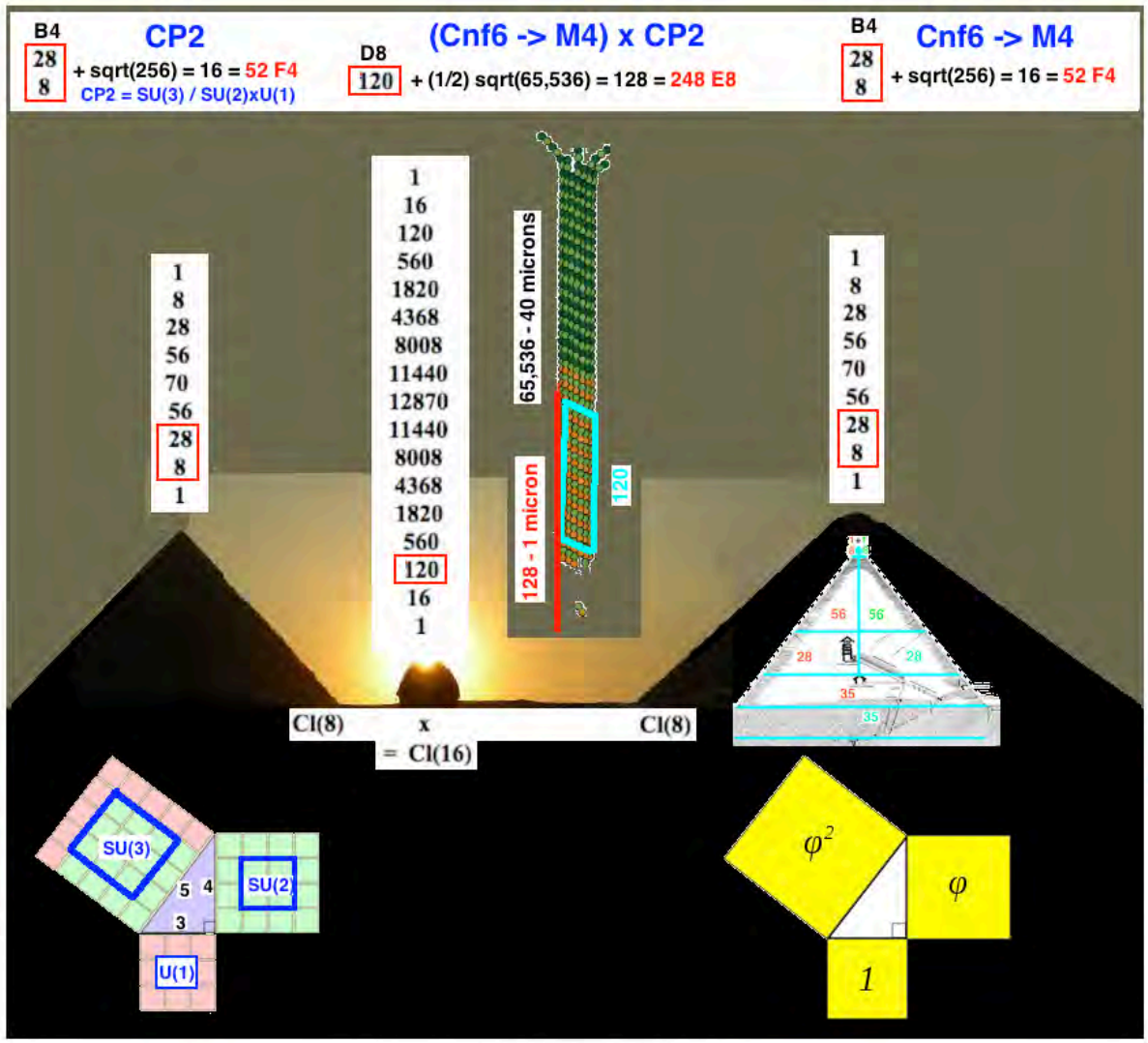
April 2019 (United States)

May 2019

S	M	T	W	T	F	S
			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	

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3 Isra and Mi'raj	4	5 New Moon	6
7	8	9	10	11	12 1st Quarter	13
14	15	16	17	18	19 Good Friday (Many regions) Full Moon	20 Passover (first day)
21 Easter Sunday	22 Easter Monday	23	24	25	26 3rd Quarter	27 Last Day of Passover
28	29	30	1 Yom HaShoah	2	3	4 New Moon



52-dim F4 of CP2 in 256-dim Cl(8)

F4 / B4 = OP2 = Spinor Fermions =
= 8 Particles + 8 AntiParticles
B4 / D4 = 8-dim SpaceTime =
= Kaluza-Klein M4 x CP2
D4 = Spin(8) contains Spin(6) = SU(4)
contains SU(3) Color Force
SU(3) Color Force = Global Symmetry
of CP2 = SU(3) / SU(2)xU(1)
SU(2)xU(1) ElectroWeak Force =
= Local Symmetry of CP2

Cross section

256
x
256
= 65,536

52-dim F4 of Cnf6 -> M4 in 256-dim Cl(8)

F4 / B4 = OP2 = Spinor Fermions =
= 8 Particles + 8 AntiParticles
B4 / D4 = 8-dim SpaceTime =
= Kaluza-Klein M4 x CP2
D4 = Spin(4,4) contains Spin(2,4) of
Conformal Gravity + Dark Energy

Cross section

E8 Kaluza-Klein (Cnf6 -> M4) x CP2

In (Cl(8) of CP2) x (Cl(8) of Cnf6 -> M4) = Cl(16)
containing E8
at each of the 256 points of Cl(8) of Cnf6 -> M4
there are all 256 points of Cl(8) of CP2

E8 / D8 = 128-dim Fermion Spinor Space = 8 components of 8+8 Fermions
D8 / D4 x D4 = A7+1 = 64 = 8-dim position x 8-dim momentum
D4 containing D3 = Spin(2,4) = A3 = SU(2,2) for Conformal Gravity + Dark Energy
D4 containing D3 = SU(4) containing Color Force SU(3)

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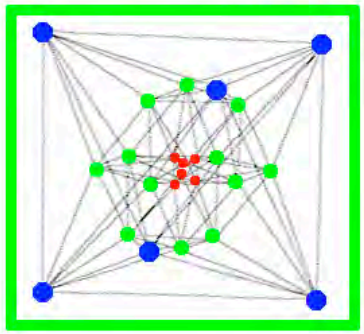
May 2019 (United States)

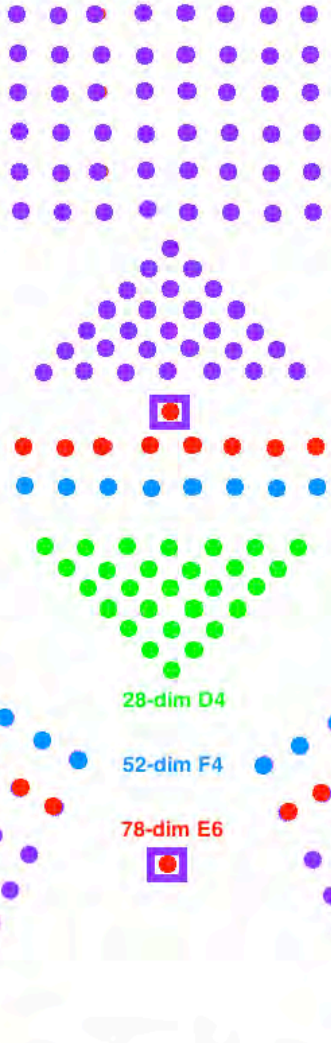
June 2019

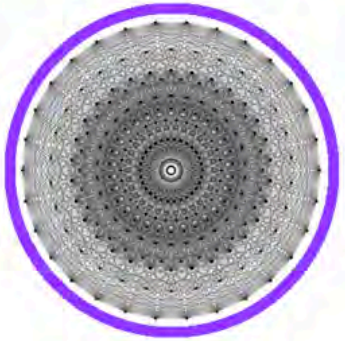
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	1 Yom HaShoah	2	3	4 New Moon
5	6 Ramadan starts	7	8	9 Yom Ha'atzmaut	10	11 1st Quarter
12	13	14	15	16	17	18 Full Moon
19	20	21	22	23 Lag BaOmer	24	25
26 3rd Quarter	27 Memorial Day	28	29	30	31 Lailat al-Qadr	1

24-Cell D4 to Pyramid F4 to E6 Tarot to 240-Polytope E8 Giza







78-dim E6 = 52-dim F4 + 26-dim J(3,O)o

2 Complex Structure Elements of 78-dim E6 are absorbed into 48+48+48+28 = 144 of 248-dim E8

E6 / (D5xU(1)) = 32-Real-dim Symmetric Space of Type EIII = (CxO)P2
16-Complex-dim NonCompact Dual = Type V Bounded Domain in subspace of J(3,CxO)
Shilov Boundary = Not Tube Type = 8-Complex-dim =
= bundle with fiber S1xS7 and base space S9 with fibration S1 -> S9 -> CP4
each fiber S1xS7 = Shilov Boundary for D5 / (D4xU(1)) = Lie Sphere RP1xS7

Force	Hermitian symmetric space		M	Vol(M)	D	Vol(D)		Qforce	Vol(Q)
gravity	Spin(5)	Spin(7) / Spin(5)xU(1)	S^4	8pi^2/3	IV5	pi^5/2^4 5!	4	RP^1xS^4	8pi^3/3
color	SU(3)	SU(4) / SU(3)xU(1)	CP^2	8pi^2/3	B^6(ball)	pi^3/6	4	S^5	4pi^3
Weak	SU(2)	Spin(5) / SU(2)xU(1)	S^2xS^2	2x4pi	IV3	pi^3/24	2	RP^1xS^2	4pi^2
e-mag	U(1)	-	T^4	4x2pi	-	-	1	-	-

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June 2019 (United States)

July 2019

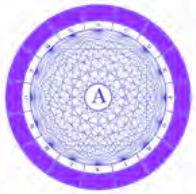
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26 3rd Quarter	27 Memorial Day	28	29	30	31 Lailat al-Qadr	1
2	3 New Moon	4	5 Eid al-Fitr	6	7	8
9 Shavuot	10 1st Quarter	11	12	13	14	15
16	17 Full Moon	18	19	20	21 June Solstice	22
23	24	25 3rd Quarter	26	27	28	29
30	1	2 New Moon	3	4 Independence Day	5	6

Ramon Llull Wheels:

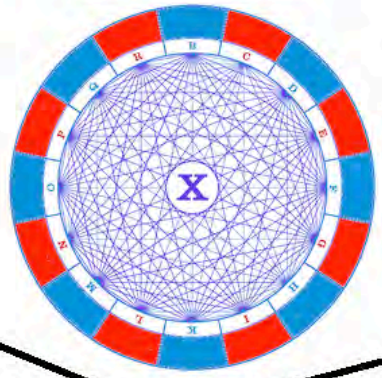
Tensor Product RxCxHxO = T = 64-dim =

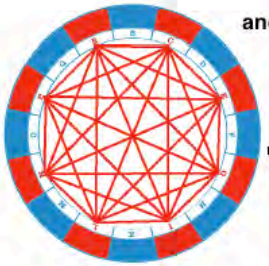
T + T = 128-dim = E8 / D8



120-dim D8
and E8 / D8 = (OxO)P2

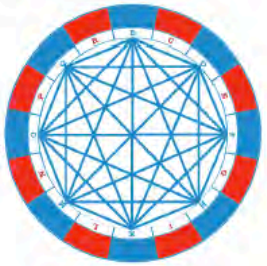
Binary Real Clifford Algebras
of tensor product Cl(8) x Cl(8) = Cl(16)



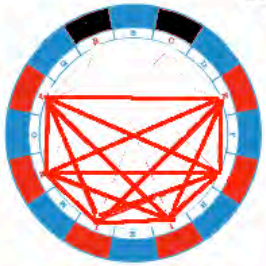


28-dim D4

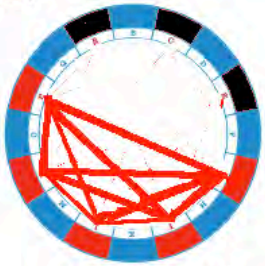
120-dim D8



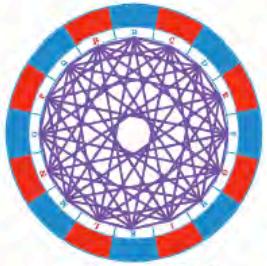
28-dim D4



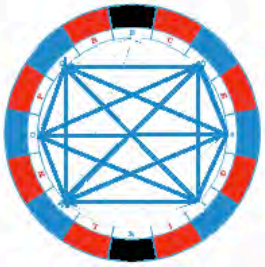
15-dim Spin(2,4)



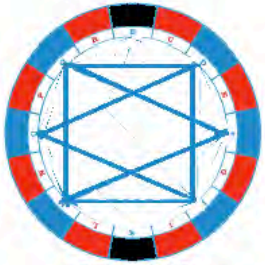
10-dim Spin(2,3)



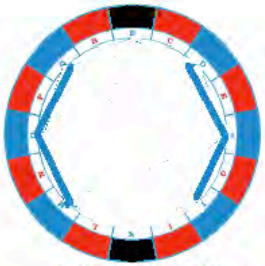
64-dim A7+R



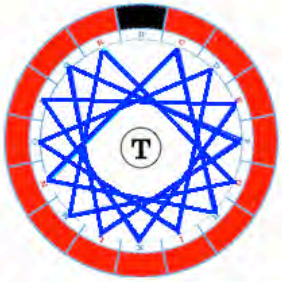
15-dim SU(4)



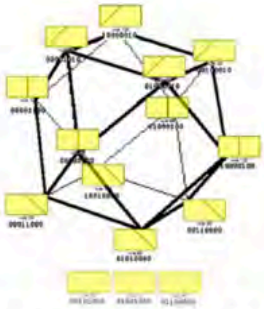
8-dim SU(3)



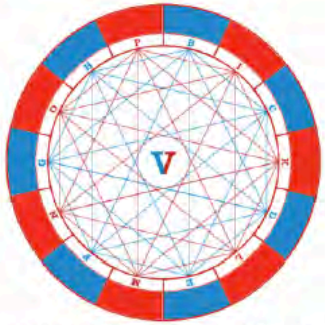
4-dim SU(2)xU(1)



4 x 3 = Cuboctahedron Vertices D3 = A3
D3 = A3 acts Conformally on M4 of M4 x CP2 Kaluza-Klein



3 = Cartan Subalgebra D3 = A3



42 Assessors = 21-dim Spin(7) + 21-dim Spin(7)
Zero Divisors of Sedenions

4 + 4 = Cube Vertices = A2 =
= SU(3) of CP2 = SU(3) / SU(2)xU(1)

4 = CP2 of M4 x CP2 Kaluza-Klein
4 = SU(2)xU(1) of CP2 = SU(3) / SU(2)xU(1)

timeanddate.com

July 2019 (United States)

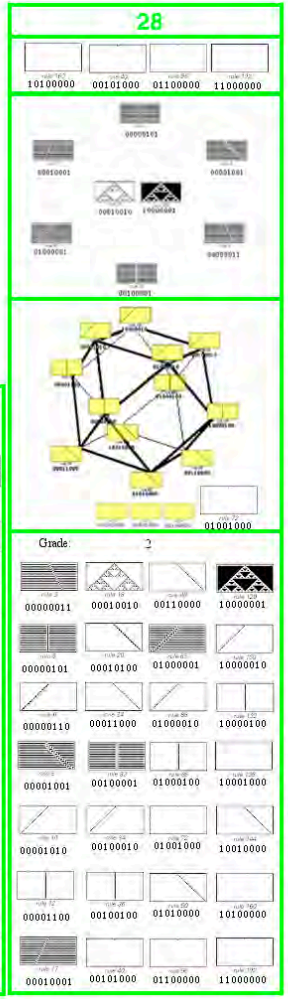
August 2019

S	M	T	W	T	F	S
				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

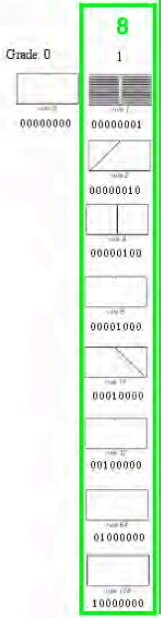
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2 ● New Moon	3	4 Independence Day	5	6
7	8	9 ◐ 1st Quarter	10	11	12	13
14	15	16 ○ Full Moon	17	18	19	20
21	22	23	24 ◑ 3rd Quarter	25	26	27
28	29	30	31 ● New Moon	1	2	3

256-dim Cl(8) as Cellular Automata

28



8



8+28+16 = 52 F4

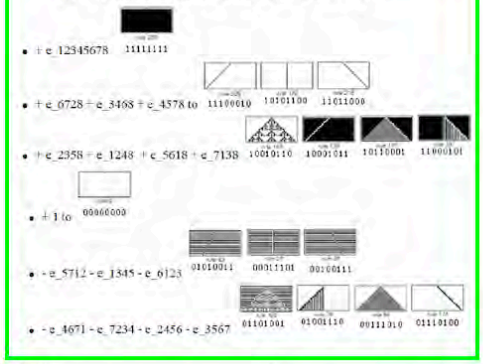
16

Cl(8) Primitive Idempotent has 16 Terms

I = (1/2)(1 + e_1248) (1/2)(1 + e_2358) (1/2)(1 + e_3468) (1/2)(1 + e_4578) =

=(1/16)(1 + e_1248 + e_2358 + e_3468 + e_4578 + e_5618 + e_6728 + e_7138 - e_3567 - e_4671 - e_5712 - e_6123 - e_7234 - e_1345 - e_2456 + e_J)

corresponding to 16 of the 256 Cellular Automata



Tensor Product Cl(8) x Cl(8) = Cl(16)

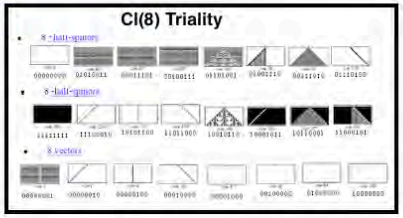
(F4 in Cl(8)) x (F4 in Cl(8)) =

= 8x8 + 28x1 + 1x28 + 16x16 =

= 120 Cl(16) BiVectors + (128 + 128) Cl(16) Spinors

120 Cl(16) BiVectors + 128 Cl(16) Half-Spinors = E8

Cl(8) Triality

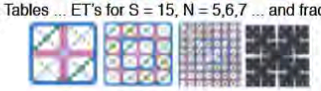


Guillermo Moreno (arXiv math/0512517) has shown that **V(7,2) = Spin(7) / Spin(5)** can be identified with the **Zero Divisors of Sedenions** which have 7+28 = 35 Associative Triples and for which Zero Divisors are given by the fibration V(7,2) -> G2 -> S3 [3-sphere] and which have 4-2=2 ZD Irreducible Components and 10-dim Lie Sphere Spin(7) / Spin(5)xU(1) whose 10D correspond to **Cl(1,9) = Cl(2,8) Conformal over Cl(1,7)** that **V(15,2) = Spin(15) / Spin(13)** is related to, but not identified with, the **Zero Divisors of 32-ons** which have 35 + 120 = 155 Associative Triples and which have 8-2=6 ZD Irreducible Components and 26-dim Lie Sphere Spin(15) / Spin(13)xU(1) whose 26D correspond to **26D String Theory and to 26-dim traceless J(3,O)o** that **V(127,2) = Spin(127) / Spin(125)** is related to, but not identified with, the **Zero Divisors of Voudon 256-ons** corresponding to Cl(8) which have 1+6+28+120+496+2016+8128=10795 Associative Triples and which have 64-2=62 ZD Irreducible Components and 250-dim Lie Sphere Spin(127) / Spin(125)xU(1)

Robert de Marrais said "... 256 ... 2^8 ions Voudons ... Moreno ... determines that the automorphism group of the ZD's of all 2^n-ions ... obey a simple pattern: for n ≥ 4 this group has the form G2 x (n-3) x S3 (... order-6 permutation group on 3 elements) ... This says the automorphism group of the Sedenions' ZD's has order 14 x 1 x 6 = 84 ... based on 7 octahedral lattices ("Box-Kites") ...

... Harmonics of Box-Kites, called here "Kite-Chain Middens," ... extend indefinitely into higher forms of 2^n -ions. All non-Midden-collected ZD diagonals in the ... 32-ons ... belong... to a set of 15 "emanation tables," ... they house 168 ... PSL(2,7) ... cells ... 8 ... 32-ons ,,, ET's ... from S = 8 to 15 ...

[here are] ... Emanation Tables ... ET's for S = 15, N = 5,6,7 ... and fractal limit ...



timeanddate.com

August 2019 (United States)

September 2019

S	M	T	W	T	F	S
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					

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31 New Moon	1	2	3
4	5	6	7 1st Quarter	8	9	10
11 Tisha B'Av	12 Eid al-Adha	13	14	15 Full Moon	16	17
18	19	20	21	22	23 3rd Quarter	24
25	26	27	28	29	30 New Moon	31

Julian Schwinger describes Elementary Particles  as volumes of space - Sources - whose properties are determined by Green's Functions characteristic of the volumes.

In E8 Physics any Elementary Particle is immediately surrounded by a cloud of virtual particle-antiparticle pairs similar to a Kerr-Newman Black Hole with Symmetric Space - Bounded Complex Domain - Shilov Boundary structure corresponding to its Gauge Group properties.
The Poisson Kernel - Bergman Kernel defines the Green's Function.

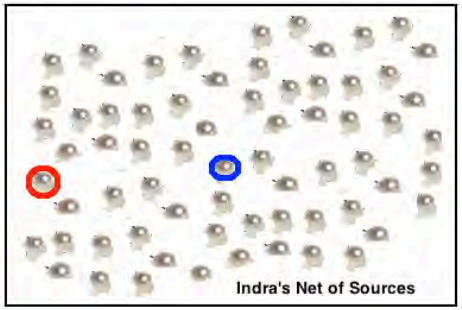
The initial Valence Particle is Planck scale. The number of Virtual Particles is determined by the Planck scale geometry of spacetime. The E8 model at the Planck Scale has spacetime condensing out of Clifford structures forming a Lorentz Leech lattice underlying 26-dim String Theory of World-Lines with 8 + 8 + 8 = 24-dim of fermion particles and antiparticles and of spacetime.
The automorphism group of one 26-dim String Theory cell modulo the Leech lattice is the Monster Group of order about 8 x 10^53.
The Cloud structure comes from the 24-dim Leech lattice part of the Monster Group which is 2^(1+24) times the double cover of Co1, for an order of about 10^26. Due to superpostions of algebraically independent E8 Lattices the total number of Virtual particle/ antiparticle pairs is about 10^27 so the volume of the Kerr-Newman Cloud is on the order of 10^27 x Planck scale, and its size should be about 10^(27/3) x 1.6 x 10^(-33) cm = roughly 10^(-24) cm.

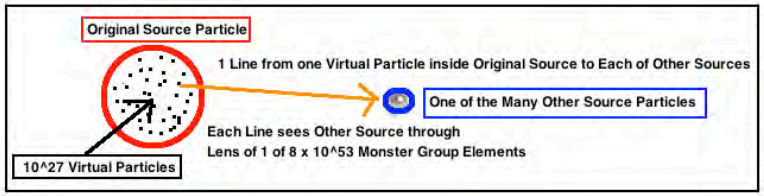
Each Schwinger Source particle-antiparticle pair should see (with Bohm Quantum Potential and Sarfatti Back-Reaction) the rest of our Universe in the perspective of 8 x 10^53 Monster Symmetry so a Schwinger Source acting as a Jewel of Indra's Net of Schwinger Source Bohm Quantum Blockchain Physics can see 10^27 x 8 x 10^53 = 8 x 10^80 Other Sources of an Indra's Net.

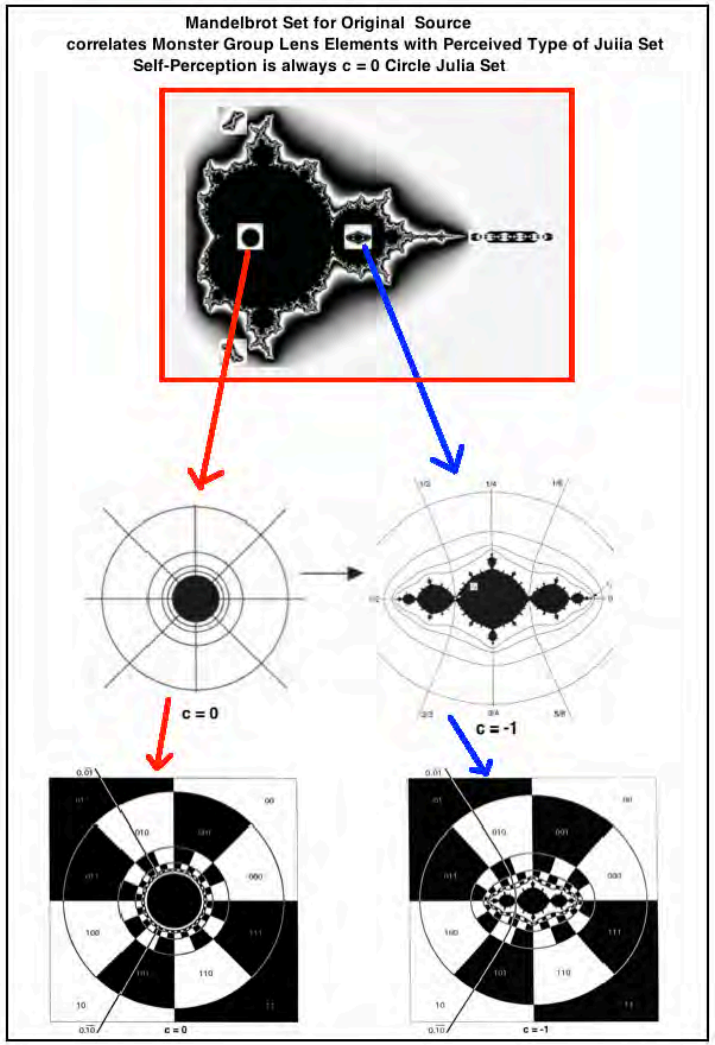
To fit inside the initial Schwinger Source the Information Elements of all the Other Schwinger Sources of Our Universe (10^77 or so) should be distributed as a Fractal Julia Set. There are 2^n stage-n cells in a Binary Decomposition of Julia Sets, so a stage-256 Julia level set based on Binary Decomposition has 2^256 = about 10^77 cells so Full Indra Net information can be seen / reflected by each Schwinger Source Indra Jewel.

Each Schwinger Source contains 10^27 Virtual pairs of particles each of which can see along a connecting Line an Other Indra's Net Source which Line sees Other Sources through Monster Group Lens elements so that the Other Source appears to the Original Source to be a Julia Set.

Each Schwinger Source has a Mandelbrot Set that tells its Source what each of the many Indra's Net Source Julia set looks like by correlating Monster Group Lens Elements with Types of Julia Set. Self-Perception is always the c = 0 Circle Julia Set.







timeanddate.com

September 2019 (United States)

October 2019

S	M	T	W	T	F	S
		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		

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Muharram	2 Labor Day	3	4	5 1st Quarter	6	7
8	9	10	11	12	13	14 Full Moon
15	16	17	18	19	20	21 3rd Quarter
22	23 September equinox	24	25	26	27	28 New Moon
29	30 Rosh Hashana	1	2	3	4	5 1st Quarter

S0 S1 S3 S7
U U U U
T = R x C x H x O
Z2 U(1) SU(2) Spin(8)

Division Algebras, Lattices, Physics, Windmill Tilting
Geoffrey Dixon

As to $\mathbf{T}$, resolve its identity into four orthogonal *idempotents*

$$\Delta_0 = \tfrac{1}{4}(1+i\vec{x})(1+ie_7) = (\tfrac{1}{2}(1+i\vec{x}))(\tfrac{1}{2}(1+ie_7))$$
$$\Delta_1 = \tfrac{1}{4}(1-i\vec{x})(1+ie_7) = (\tfrac{1}{2}(1-i\vec{x}))(\tfrac{1}{2}(1+ie_7))$$
$$\Delta_2 = \tfrac{1}{4}(1+i\vec{y})(1-ie_7) = (\tfrac{1}{2}(1+i\vec{y}))(\tfrac{1}{2}(1-ie_7))$$
$$\Delta_3 = \tfrac{1}{4}(1-i\vec{y})(1-ie_7) = (\tfrac{1}{2}(1-i\vec{y}))(\tfrac{1}{2}(1-ie_7))$$

In the Pauli algebra case, we got Dirac spinors by doubling $\mathbf{P}$ to $\mathbf{P}^2$ we double up and use $\mathbf{T}^2$ as our spinor space. Let Ψ be a $\mathbf{T}^2$ spinor the following identifications fall out of the mathematics

$\rho_+\Psi$: matter
$\rho_-\Psi$: antimatter

8 Fermion First-Generation Particles
each with 8 Spacetime Components

$\rho_+\Psi\Delta_0$: matter - neutrino - $SU(3)$ singlet
$\rho_+\Psi\Delta_1$: matter - electron - $SU(3)$ singlet
$\rho_+\Psi\Delta_2$: matter - up quark - $SU(3)$ triplet
$\rho_+\Psi\Delta_3$: matter - down quark - $SU(3)$ triplet

+

8 Fermion First-Generation AntiParticles
each with 8 Spacetime Components

$\rho_-\Psi\Delta_3$: antimatter - antineutrino - $SU(3)$ antisinglet
$\rho_-\Psi\Delta_2$: antimatter - positron - $SU(3)$ antisinglet
$\rho_-\Psi\Delta_1$: antimatter - anti-up antiquark - $SU(3)$ antitriplet
$\rho_-\Psi\Delta_0$: antimatter - anti-down antiquark - $SU(3)$ antitriplet

= 8x8 + 8x8 = 64 + 64 = T + T = 128 = T2 =

= E8 / D8 = (OxO)P2 = HalfSpinors of Cl(16)

Geoffrey Dixon wrote a 1995 paper in which he represented the Leech lattice over $\mathbf{O}^3$.
the final result breaks up the inner shell of Λ_{24},
which is of order $K_{24} = 196560$,
into three subsets with orders $3\times240 = 720$,
$3 \times 240 \times 16 = 11520$, and $3 \times 240 \times 16 \times 16 = 184320$,
the sum of all three orders being 196560.

Here is a summary of E8 Physics model calculation results. Since ratios are calculated, values for one particle mass and one force strength are assumed.
Quark masses are constituent masses. Most of the calculations are tree-level, so more detailed calculations might be even closer to observations.

Dark Energy : Dark Matter : Ordinary Matter = 0.75 : 0.21 : 0.04

Fermions as Schwinger Sources have geometry of Complex Bounded Domains with Kerr-Newman Black Hole structure size about 10^(-24) cm.

Particle/Force	Tree-Level	Higher-Order
e-neutrino	0	0 for nu_1
mu-neutrino	0	9 x 10^(-3) eV for nu_2
tau-neutrino	0	5.4 x 10^(-2) eV for nu_3
electron	0.5110 MeV	
down quark	312.8 MeV	charged pion = 139 MeV
up quark	312.8 MeV	proton = 938.25 MeV
		neutron - proton = 1.1 MeV
muon	104.8 MeV	106.2 MeV
strange quark	625 MeV	
charm quark	2090 MeV	
tauon	1.88 GeV	
beauty quark	5.63 GeV	
truth quark (low state)	130 GeV	(middle state) 174 GeV
		(high state) 218 GeV
W+	80.326 GeV	
W-	80.326 GeV	
W0	98.379 GeV	Z0 = 91.862 GeV
Mplanck 1.217x10^19 GeV		
Higgs VEV (assumed)	252.5 GeV	
Higgs (low state)	126 GeV	(middle state) 182 GeV
		(high state) 239 GeV
Gravity Gg (assumed)	1	
(Gg)(Mproton^2 / Mplanck^2)		5 x 10^(-39)
EM fine structure	1/137.03608	
Weak Gw	0.2535	
Gw(Mproton^2 / (Mw+^2 + Mw-^2 + Mz0^2))		1.05 x 10^(-5)
Color Force at 0.245 GeV	0.6286	0.106 at 91 GeV

Kobayashi-Maskawa parameters for W+ and W- processes are:

	d	s	b
u	0.975	0.222	0.00249 -0.00388i
c	-0.222 -0.000161i	0.974 -0.0000365i	0.0423
t	0.00698 -0.00378i	-0.0418 -0.00086i	0.999

The phase angle d13 is taken to be 1 radian.

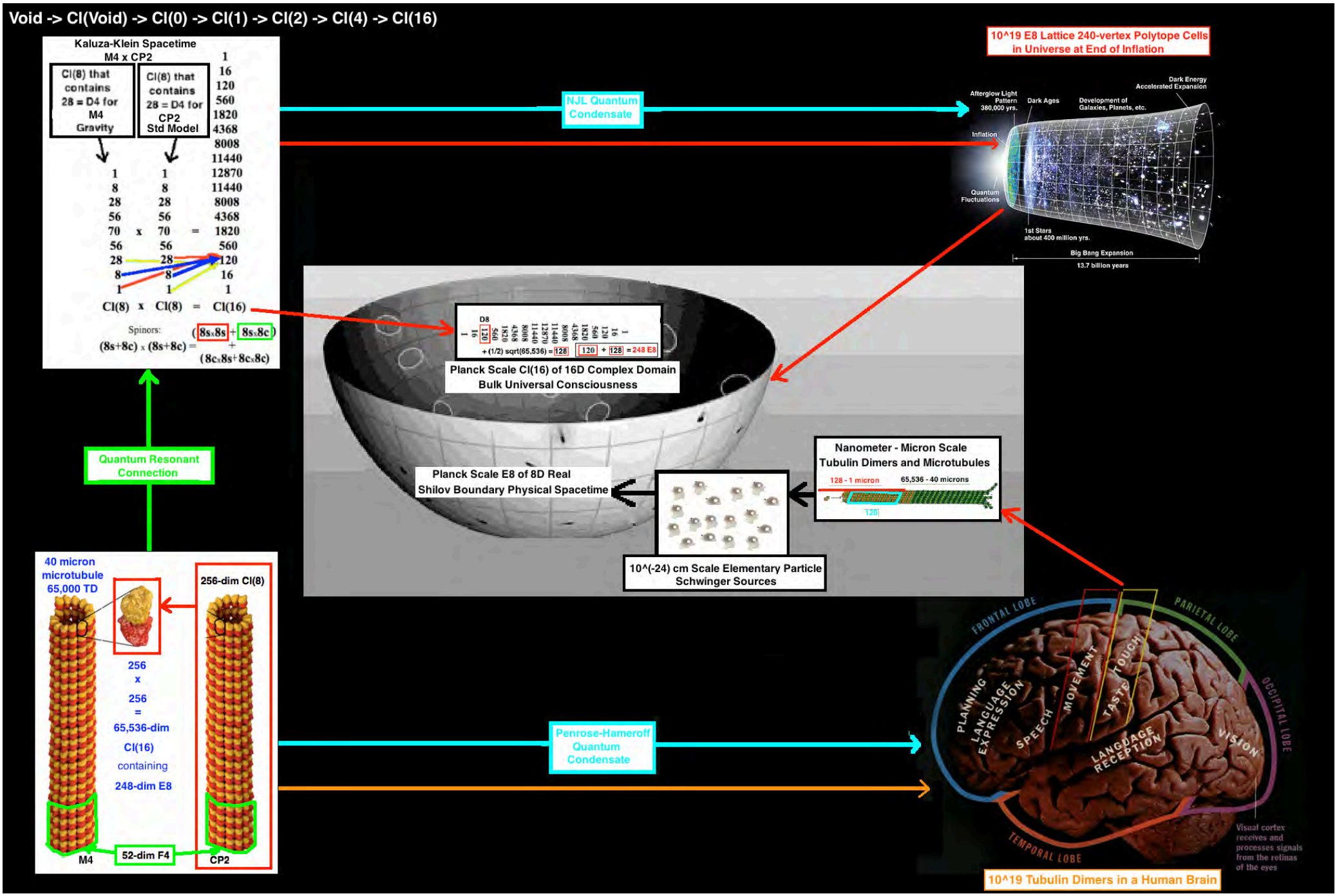
timeanddate.com

October 2019 (United States)

November 2019

S	M	T	W	T	F	S
					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

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30 Rosh Hashana	1	2	3	4	5 ◐ 1st Quarter
6	7	8	9 Yom Kippur	10	11	12
13 ○ Full Moon	14 Columbus Day (Most regions) First Day of Sukkot	15	16	17	18	19
20 Last Day of Sukkot	21 Shmini Atzeret ◑ 3rd Quarter	22 Simchat Torah	23	24	25	26
27 ● New Moon	28	29	30	31	1	2


Void -> Cl(Void) -> Cl(0) -> Cl(1) -> Cl(2) -> Cl(4) -> Cl(16)
Kaluza-Klein Spacetime
M4 x CP2
Cl(8) that contains 28 = D4 for M4 Gravity
Cl(8) that contains 28 = D4 for CP2 Std Model
1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1
1 8 28 56 70 56 28 8 1 x 1 8 28 56 70 56 28 8 1 = 1 16 120 560 1820 560 120 16 1
Cl(8) x Cl(8) = Cl(16)
Spinors:
(8s+8c) x (8s+8c) = (8sx8s + 8sx8c) + (8cx8s+8cx8c)
Quantum Resonant Connection
40 micron microtubule 65,000 TD
256-dim Cl(8)
256 x 256 = 65,536-dim Cl(16) containing 248-dim E8
M4
52-dim F4
CP2
Penrose-Hameroff Quantum Condensate
NJL Quantum Condensate
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation
Afterglow Light Pattern 380,000 yrs.
Dark Ages
Development of Galaxies, Planets, etc.
Dark Energy Accelerated Expansion
Inflation
Quantum Fluctuations
1st Stars about 400 million yrs.
Big Bang Expansion
13.7 billion years
D8
1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1
+(1/2) sqrt(65,536) = 128
120 + 128 = 248 E8
Planck Scale Cl(16) of 16D Complex Domain Bulk Universal Consciousness
Planck Scale E8 of 8D Real Shilov Boundary Physical Spacetime
10^(-24) cm Scale Elementary Particle Schwinger Sources
Nanometer - Micron Scale Tubulin Dimers and Microtubules
128 - 1 micron
65,536 - 40 microns
120
FRONTAL LOBE
PARIETAL LOBE
OCCIPITAL LOBE
TEMPORAL LOBE
PLANNING
LANGUAGE EXPRESSION
SPEECH
MOVEMENT
TASTE
TOUCH
LANGUAGE RECEPTION
VISION
Visual cortex receives and processes signals from the retinas of the eyes
10^19 Tubulin Dimers in a Human Brain

timeanddate.com

November 2019 (United States)

December 2019

S	M	T	W	T	F	S
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				

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27 New Moon	28	29	30	31	1	2
3	4 1st Quarter	5	6	7	8	9
10 The Prophet's Birthday	11 Veterans Day	12 Full Moon	13	14	15	16
17	18	19 3rd Quarter	20	21	22	23
24	25	26 New Moon	27	28 Thanksgiving Day	29	30

Void -> Cl(Void) -> Cl(0) -> Cl(1) -> Cl(2) -> Cl(4) -> Cl(16)

Kaluza-Klein Spacetime
M4 x CP2

Cl(8) that contains 28 = D4 for M4 Gravity	Cl(8) that contains 28 = D4 for CP2 Std Model	
		1
		16
		120
		560
		1820
		4368
		8008
		11440
1	1	12870
8	8	11440
28	28	8008
56	56	4368
70	70	1820
56	56	560
28	28	120
8	8	16
1	1	1

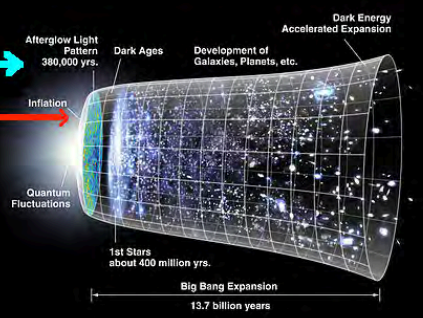
Cl(8) x Cl(8) = Cl(16)

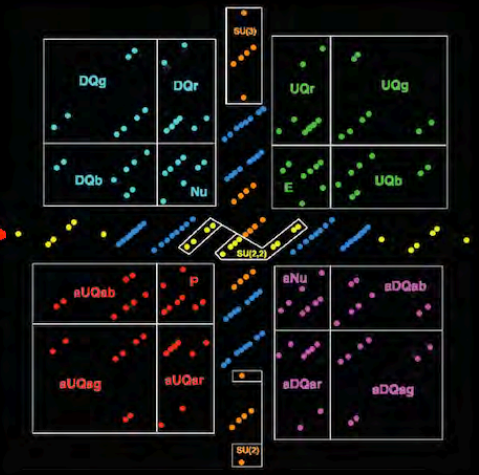
Spinors: (8s x 8s + 8s x 8c)
(8s+8c) x (8s+8c) = +
(8c x 8s + 8c x 8c)

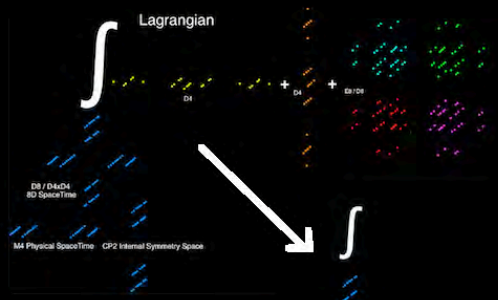
Quantum Resonant Connection

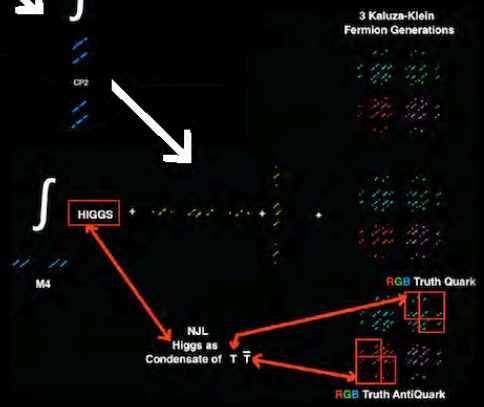
NJL Quantum Condensate

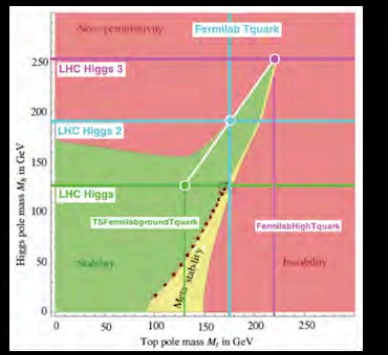
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation







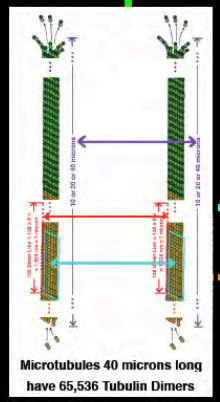




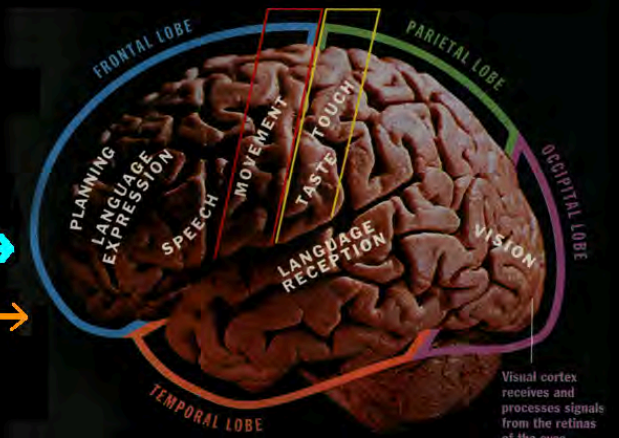
Cl(0,16) x Cl(0,8) = Cl(0,24)

M(2,Cl(0,24)) = Cl(1,25)

Completion of Union of
All Tensor Products of Cl(1,25) = **AQFT**



Penrose-Hameroff Quantum Condensate



10^19 Tubulin Dimers in a Human Brain

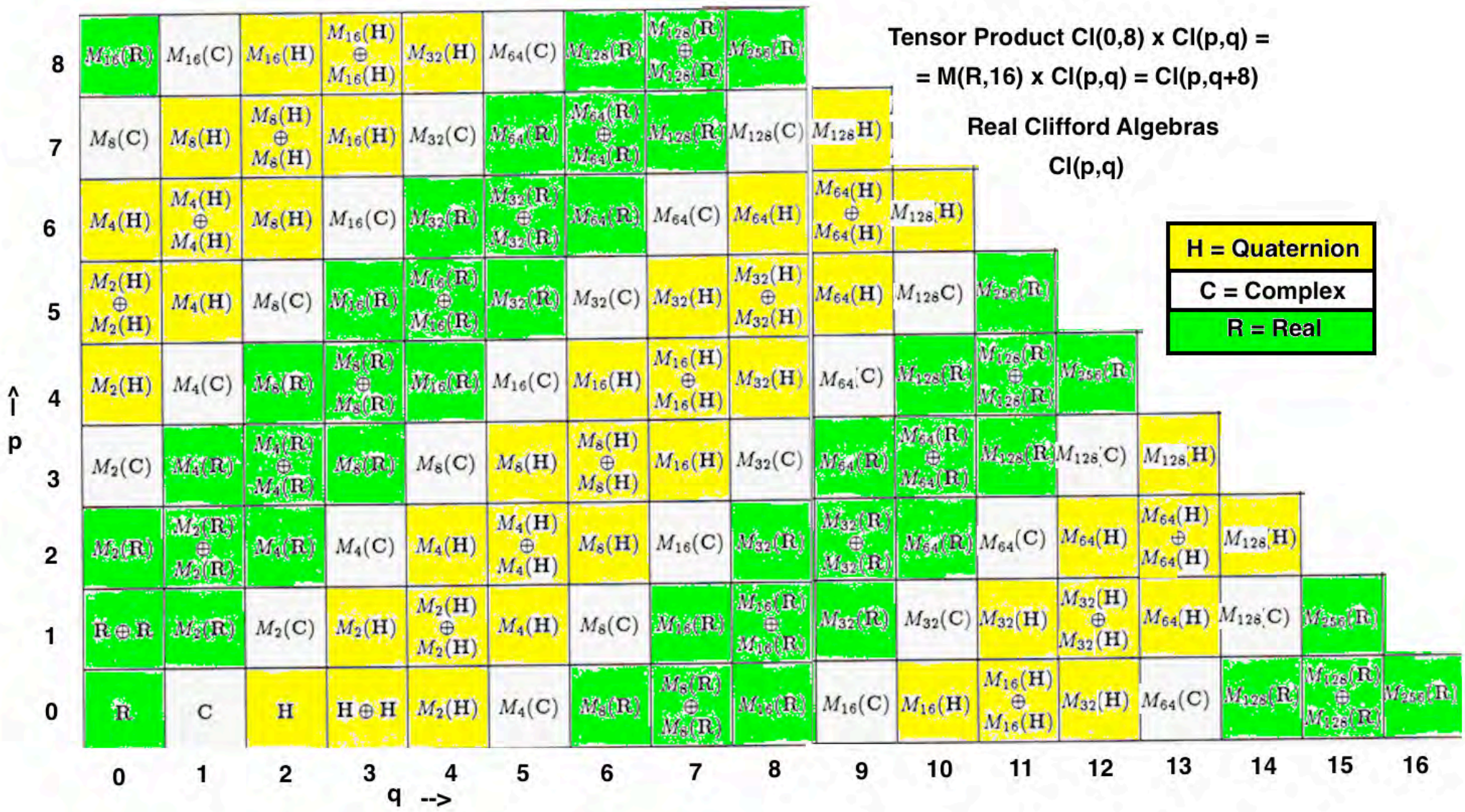
timeanddate.com

December 2019 (United States)

January 2020

S	M	T	W	T	F	S
			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	

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4 1st Quarter	5	6	7
8	9	10	11	12 Full Moon	13	14
15	16	17	18 3rd Quarter	19	20	21 December Solstice
22	23 Chanukah/Hanukkah (first day)	24 Christmas Eve	25 Christmas Day	26 New Moon	27	28
29	30 Last Day of Chanukah	31	1 New Year's Day	2 1st Quarter	3	4


Tensor Product Cl(0,8) x Cl(p,q) =
= M(R,16) x Cl(p,q) = Cl(p,q+8)
Real Clifford Algebras
Cl(p,q)
H = Quaternion
C = Complex
R = Real
p
q -->


2018
JAN 1
JAN 2-7
JAN 8
JAN 9-15
JAN 16
JAN 17-23
JAN 24
JAN 25-30
JAN 31
FEB 1-6
FEB 7
FEB 8-14
FEB 15
FEB 16-22
FEB 23
FEB 24-28
MAR 1
MAR 2-8
MAR 9
MAR 10-16
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MAR 18-23
MAR 24
MAR 25-30
MAR 31
APR 1-7
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APR 9-14
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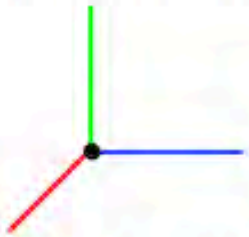
APR 16-21
APR 22
APR 23-28
APR 29
APR 30-MAY 6
MAY 7
MAY 8-14
MAY 15
MAY 16-20
MAY 21
MAY 22-28
MAY 29
MAY 30-JUN 5
JUN 6
JUN 7-12
JUN 13
JUN 14-19
JUN 20
JUN 21-26
JUN 27
JUN 28-JUL 5
JUL 6
JUL 7-11
JUL 12
JUL 13-18
JUL 19
JUL 20-26
JUL 27
JUL 28-AUG 3
AUG 4
AUG 5-10
AUG 11
AUG 12-17
AUG 18
AUG 19-25
AUG 26
AUG 27-SEP 1
SEP 2
SEP 3-8
SEP 9
SEP 10-15
SEP 16
SEP 17-23
SEP 24
SEP 25-OCT 1
OCT 2
OCT 3-7
OCT 8
OCT 9-15
OCT 16
OCT 17-23
OCT 24
OCT 25-30
OCT 31
NOV 1-6
NOV 7
NOV 8-14
NOV 15
NOV 16-21
NOV 22
NOV 23-28
NOV 29
NOV 30-DEC 5
DEC 6
DEC 7-14
DEC 15
DEC 16-21
DEC 22
DEC 23-28
DEC 29
DEC 30-JAN 5

Clifford Algebra = Algebra of Spaces =
= Fundamental Human Understanding

For our 3-dim Space with coordinates x y z

Cl(3) describes

1 - all of 3-space itself



3 - three types of planes in space:

xy yz zx

3 - three types of lines / directions in space:

x y z

1 - one type of 0-dim point

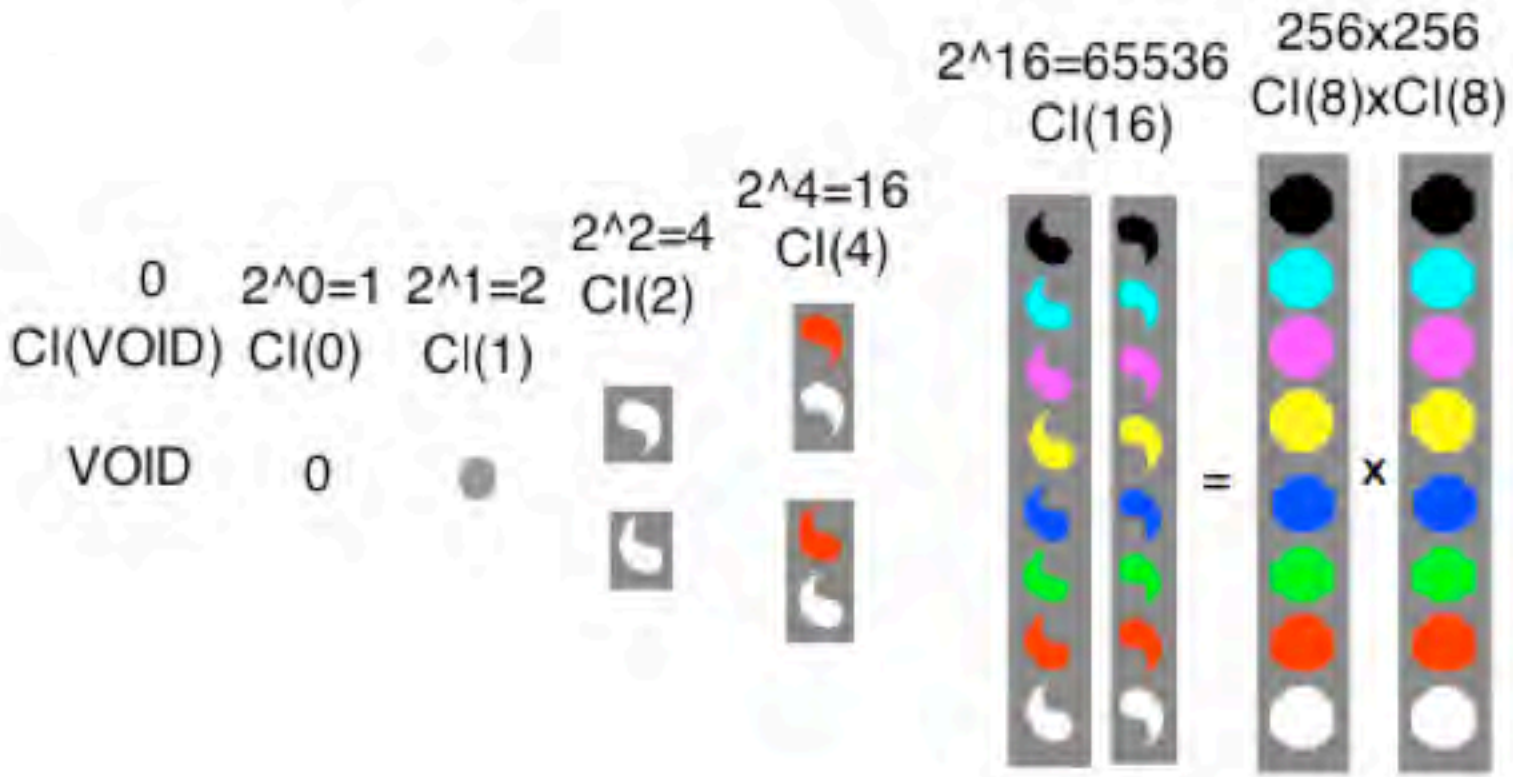
so

Cl(3) of 3-dim space has total dimension

1+3+3+1 = 2^3 = 8

Generally, Cl(N) of N-dim space has dimension 2^N so the process of forming Clifford Algebra creates 2^N -dim spaces from N-dim spaces

THIS IS HOW OUR UNIVERSE GREW FROM NOTHING:

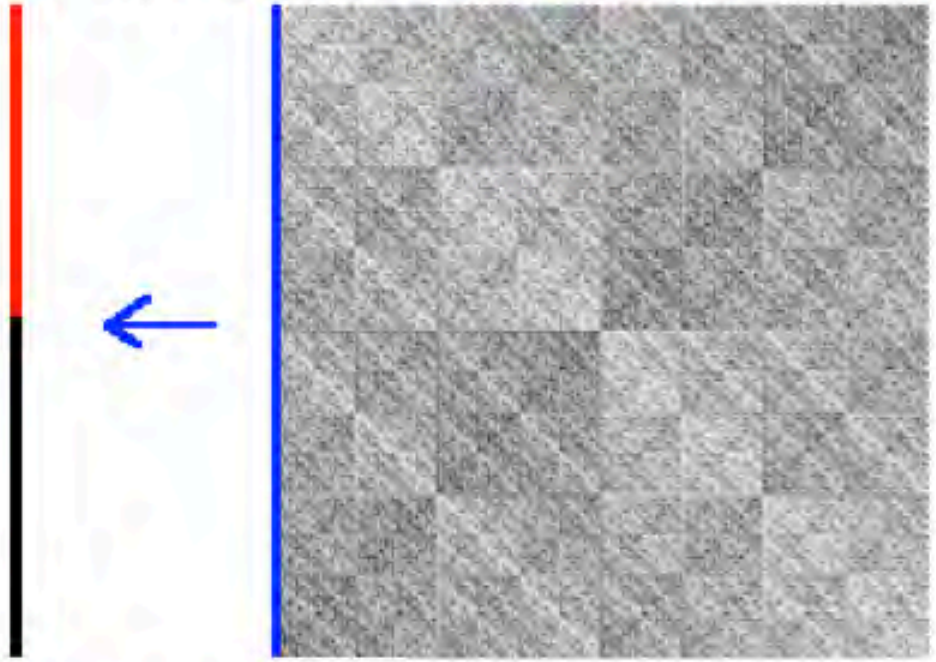


Cl(16) = 2^16 = 65,536 dimensions with graded structure

1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1

The 120 grade-2 BiVectors form the D8 Lie Algebra
that is related to rotations in 16-dim space

The Real Clifford Algebra Cl(16) = 256 x 256 Real Matrix Algebra



The 256 first-column-vectors are the Spinors of D8
that are related to entanglement of connections to 16-dim space
The 256 D8 Spinors break down into two half-Spinors
256 = 128 + 128

The 128 and 128 half-spinors are mirror images of each other
so 128 can describe all useful physics by itself.

120 D8 BiVectors + 128 D8 half-Spinors = 248-dim E8

248-dim E8 lives in Cl(16)
containing 120-dim D8 biVectors of Cl(16)

E8 / D8 = 64 + 64 Fermions = 128-dim D8 half-Spinors of Cl(16)

D8 / D4 x D4 = 64 Spacetime

D4 = 28 Standard Model (12)
with 16 Gravity + Dark Energy Ghosts

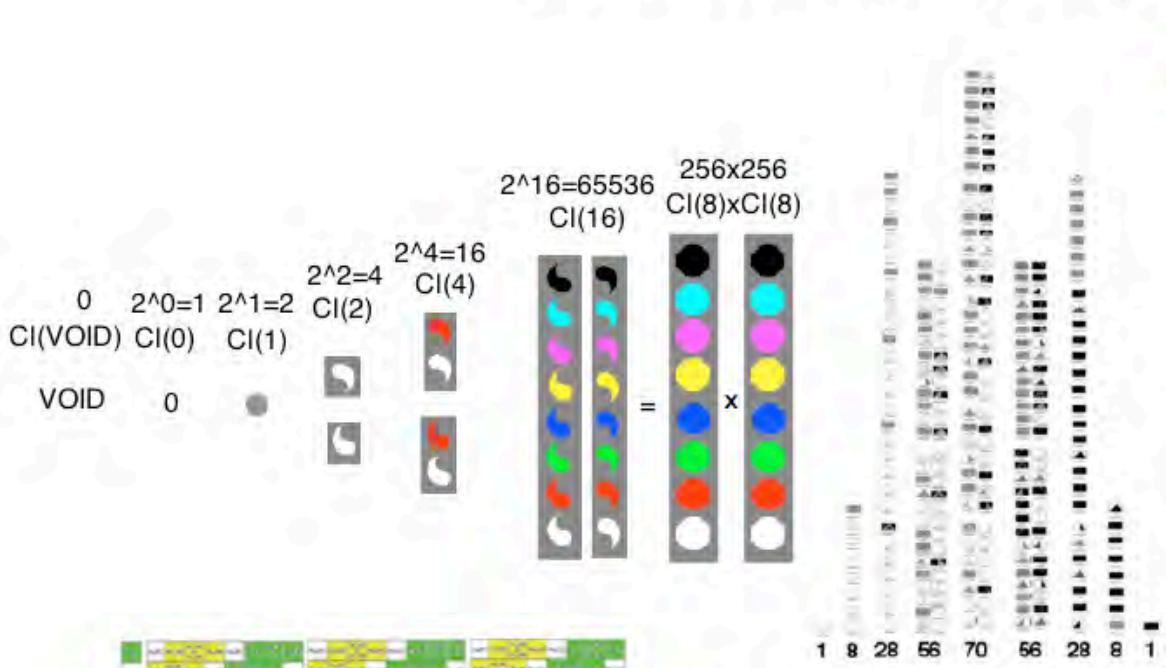
D4 = 28 Gravity + Dark Energy (16)
with 12 Standard Model Ghosts

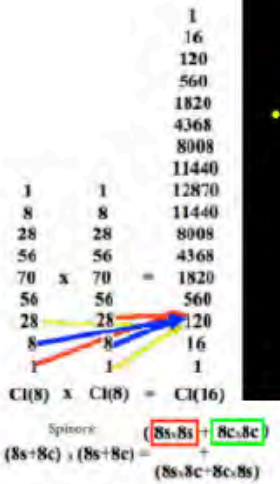
Dimension of Clifford Algebra						
0	2^0=1	2^1=2	2^2=4	2^4=16	2^16=65536	256x256

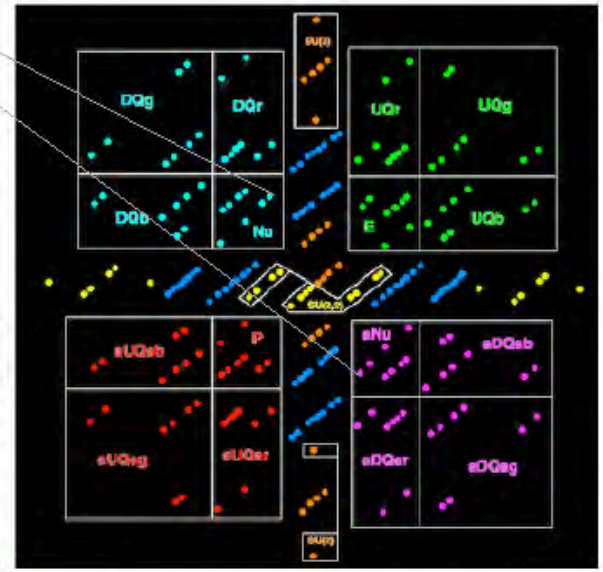
VOID -> Cl(VOID) -> Cl(0,0) -> Cl(0,1)-> Cl(0,2) -> Cl(0,4) -> Cl(0,16) = Cl(0,8)xCl(0,8) --> Cl(0,16)xCl(0,8) = Cl(0,24) -> M(2,Cl(0,24)) = Cl(1,25) ->

-> Completion of Union of All Tensor Products of Cl(1,25) = hyperfinite AQFT

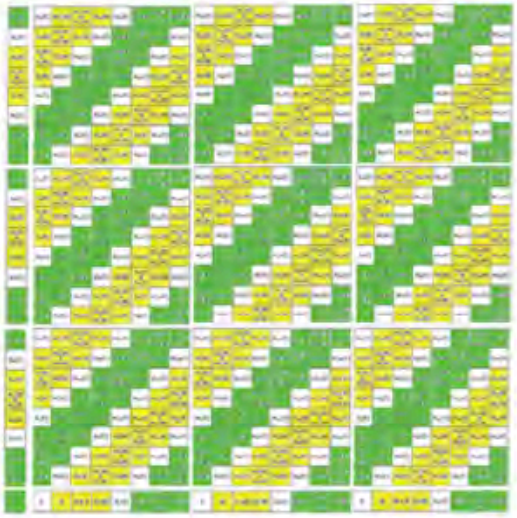
Cl(1,25) = Cl(1,9)xCl(0,8)xCl(0,8) and Cl(1,9) = Cl(1,5) x Cl(0,4) = Cl(2,4) x Cl(0,4)







Cl(16) contains 120 + 64 + 64 = 248 = E8
with 112 + 128 = 240 root vectors



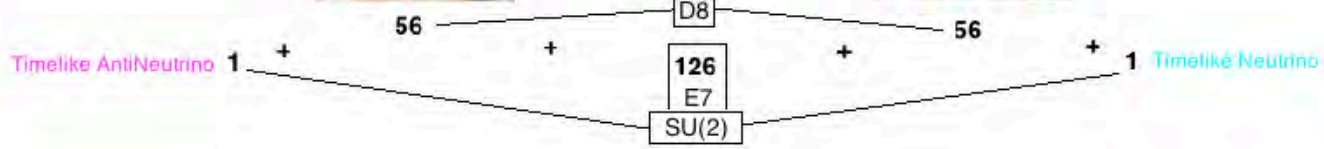
The completion of the union of all tensor products of Cl(16) = Cl(8)xCl(8) produces a generalized Hyperfinite II1 von Neumann factor that gives the Cl(16)-E8 model a natural Algebraic Quantum Field Theory

The Cl(16)-E8 AQFT inherits structure from the Cl(16)-E8 Local Lagrangian

The Creation-Annihilation Operator structure of Cl(16)-E8 AQFT is given by the Maximal Contraction of E8 = semidirect product A7 x h92
where h92 = 92+1+92 = 185-dim Heisenberg algebra and A7 = 63-dim SL(8)

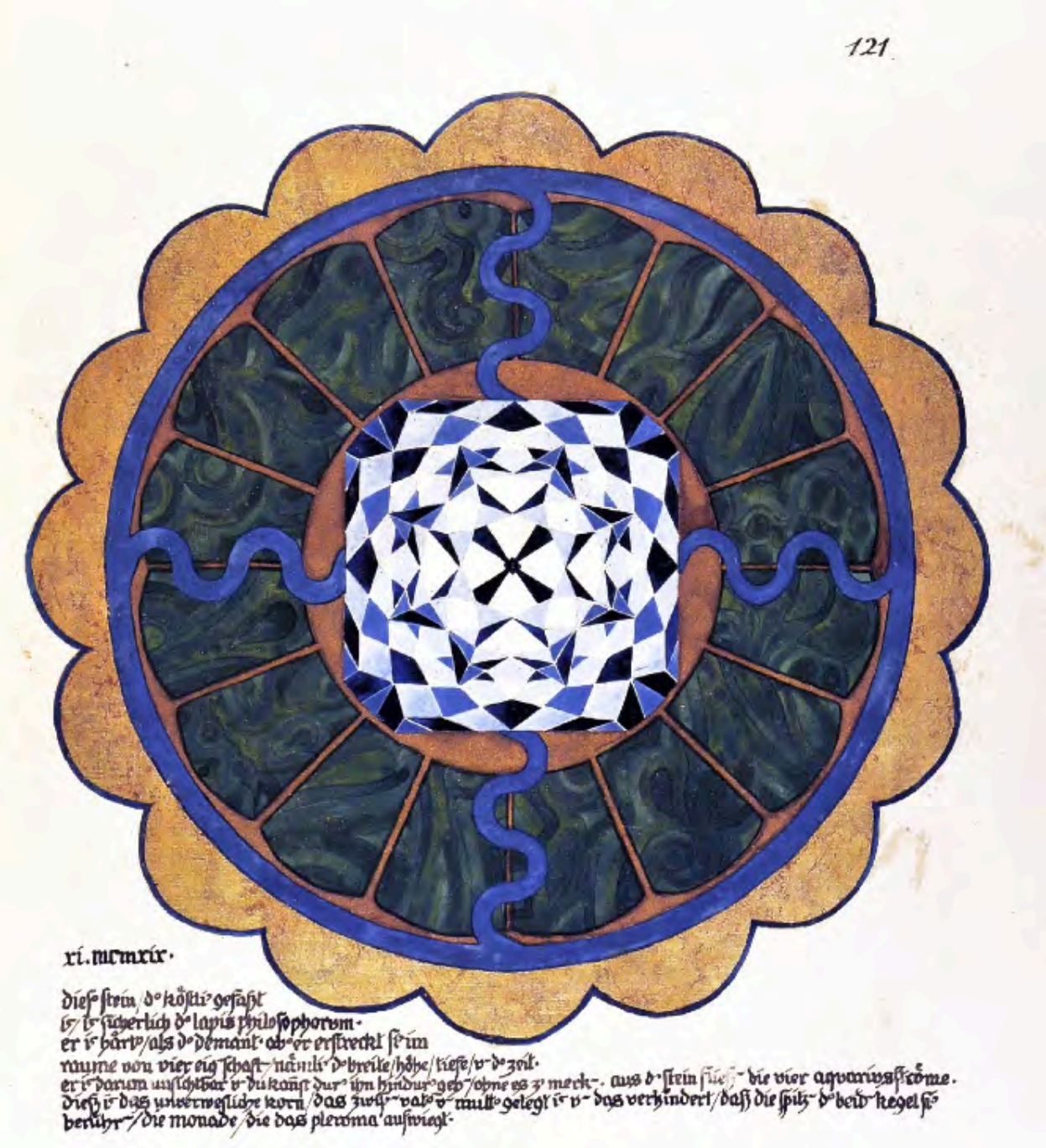
240 E8 Root Vectors

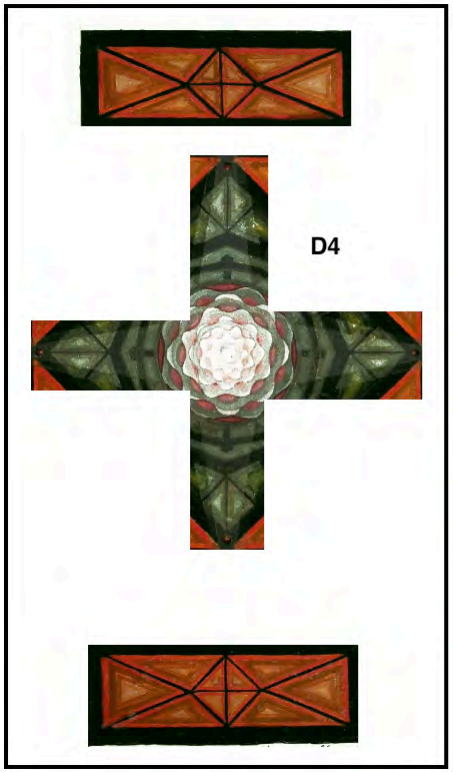
112 = 56 + 56 = (24+32) + (24-32)
128 = 1+126+1

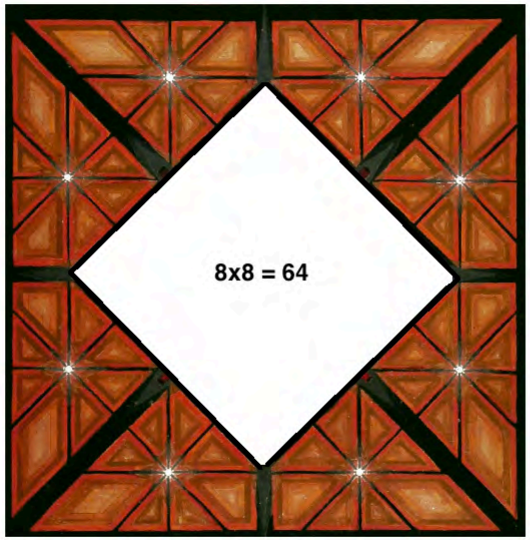


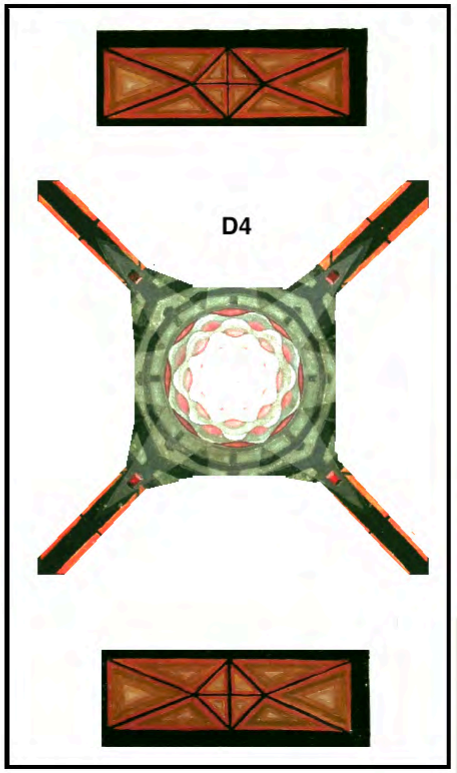
When Our Planck Scale Universe emerged from its Parent Universe by Quantum Fluctuation it was described by SO(16) symmetry of Compact E8(-248).
E8 Compact Form E8(-248) with Symmetric Space E8 / Spin(16) represents Our Planck Scale Universe when it emerged from its Parent Universe by Quantum Fluctuation.

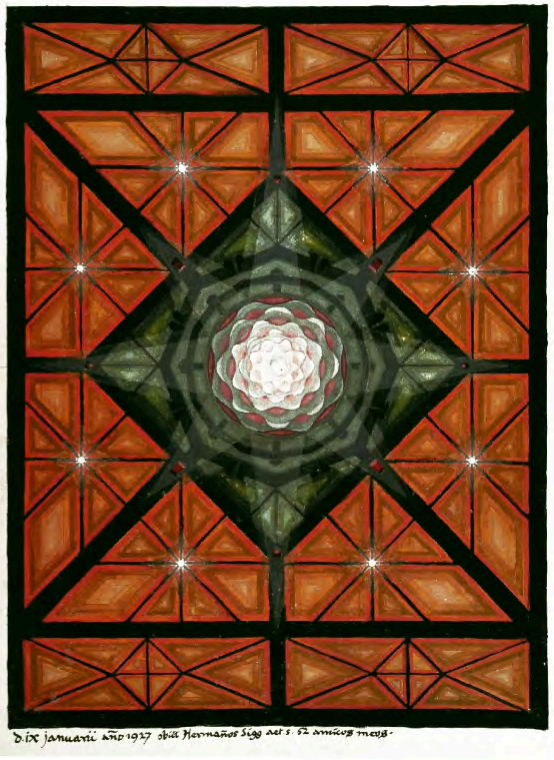
E8 Split Form EVIII E8(8) with Symmetric Space E8 / SO(8,8)
represents
Our Universe during Octonionic Inflation
with Non-Unitary Quantum Processes.











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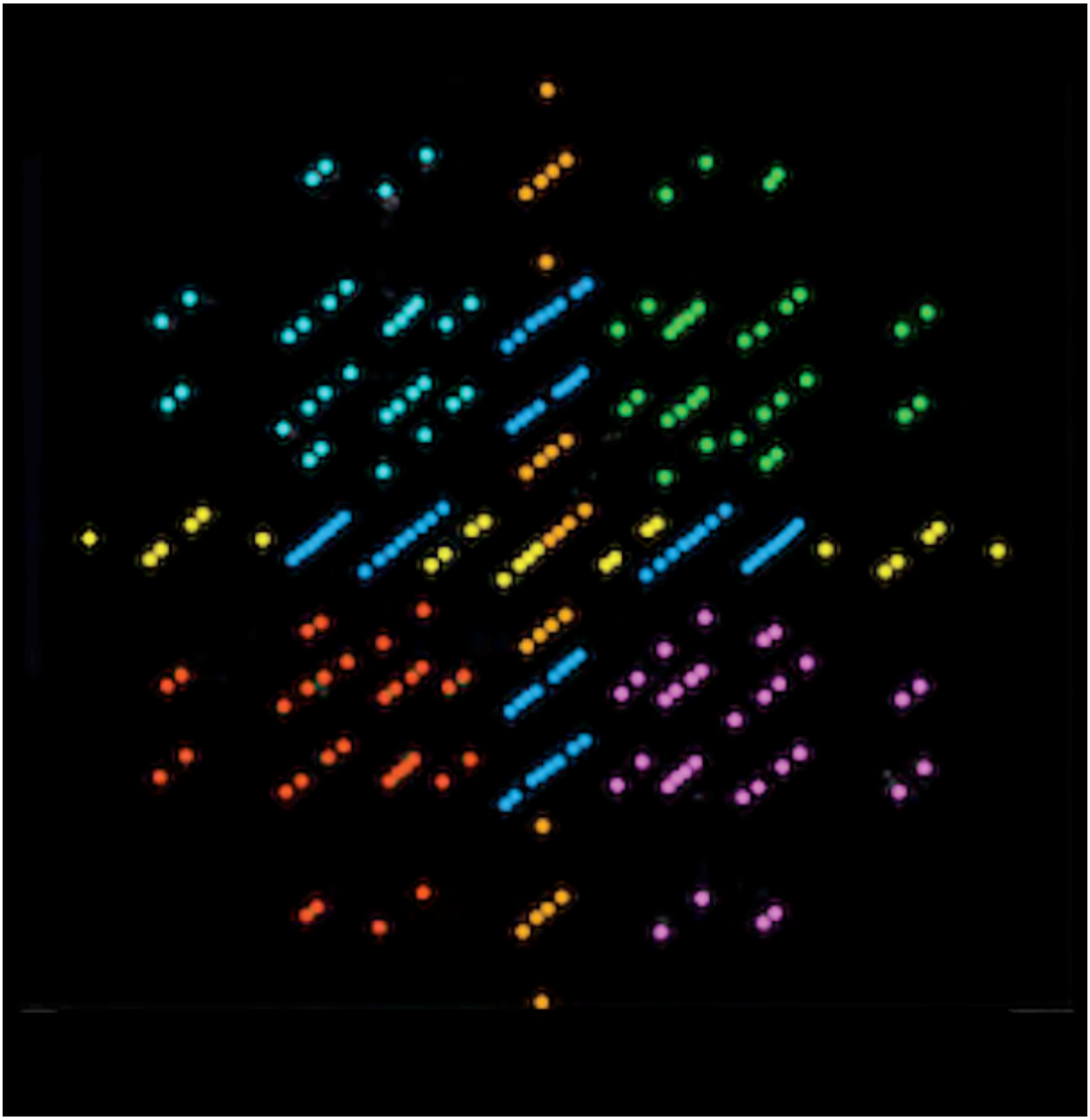
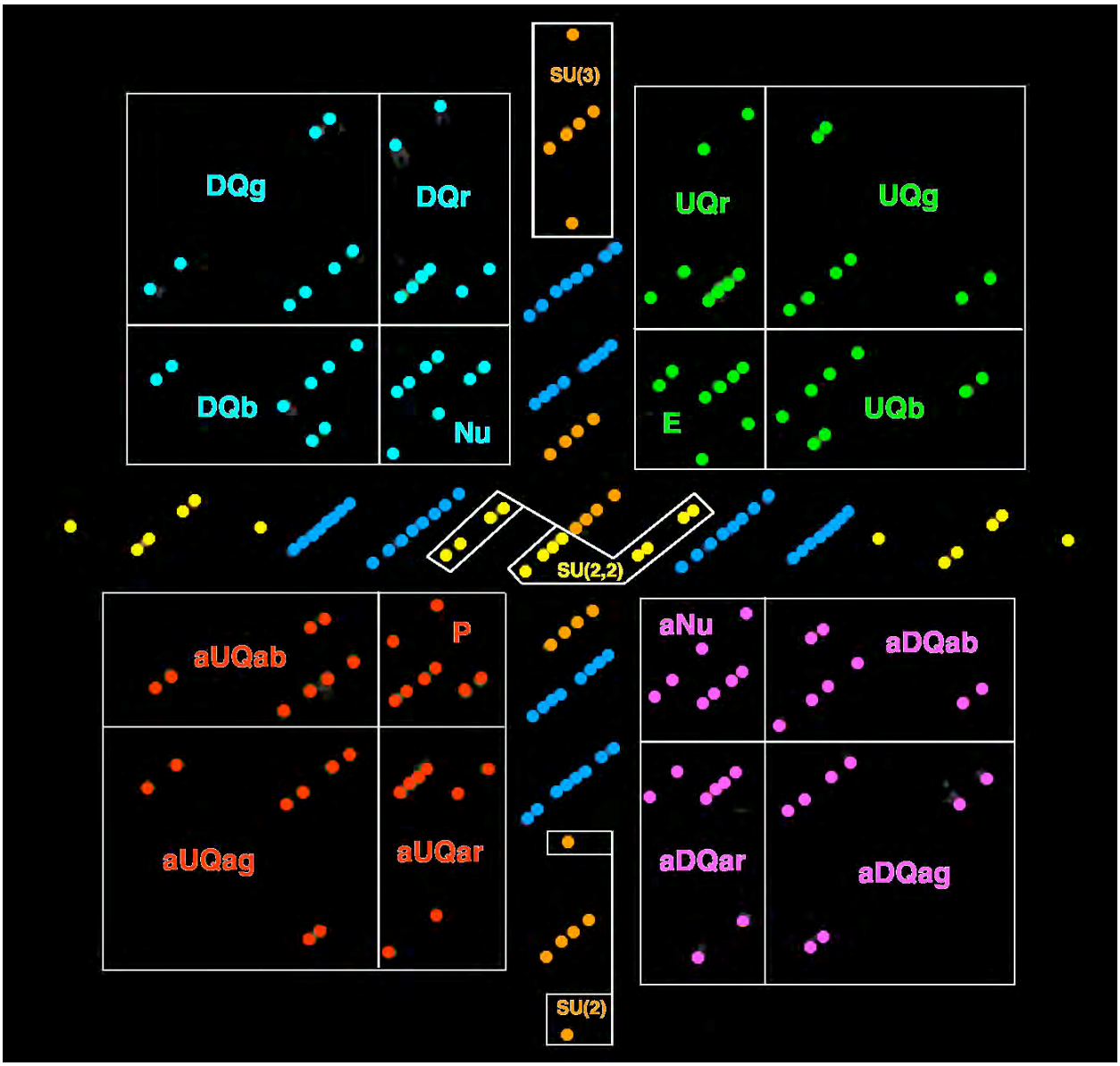
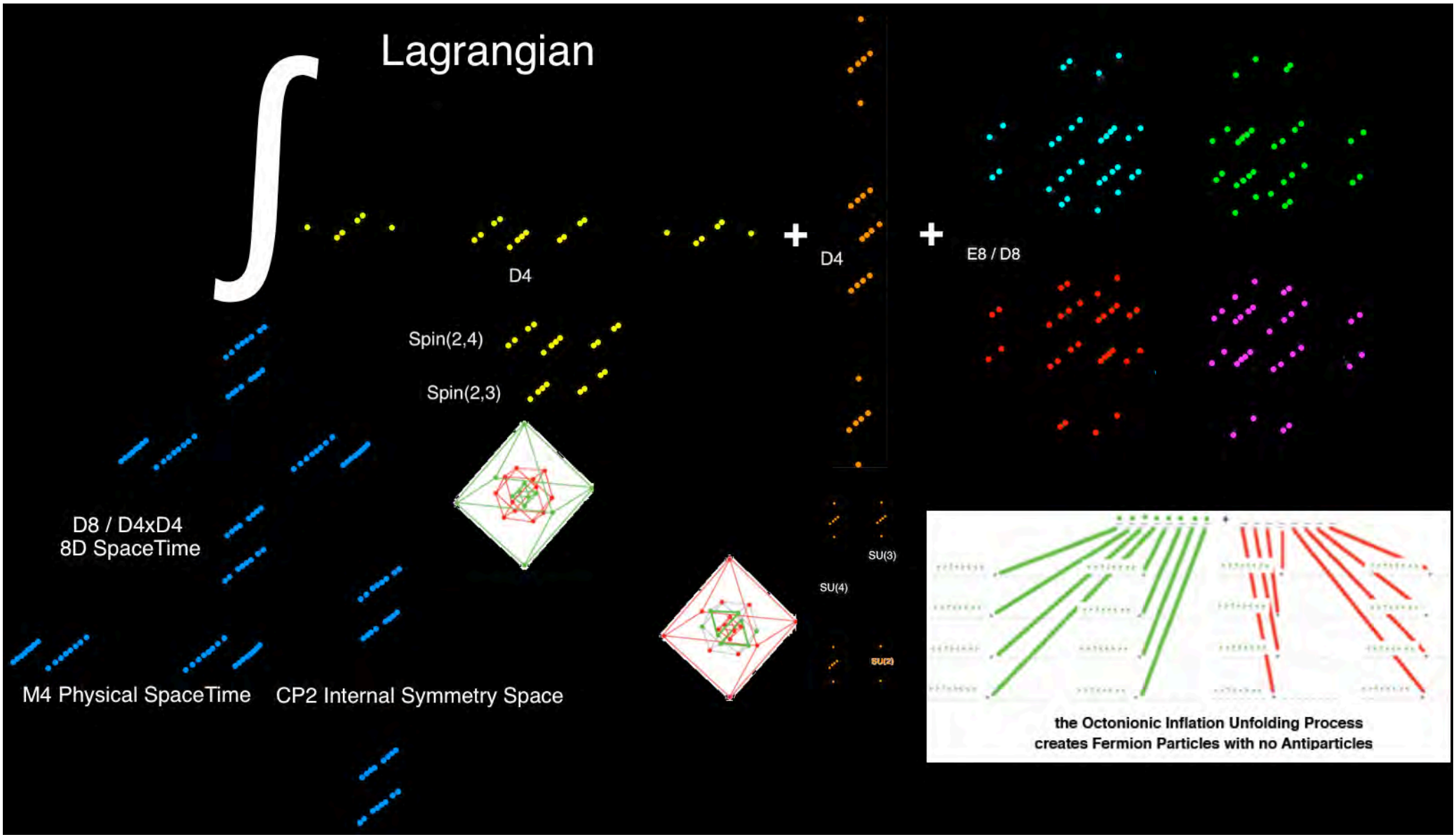
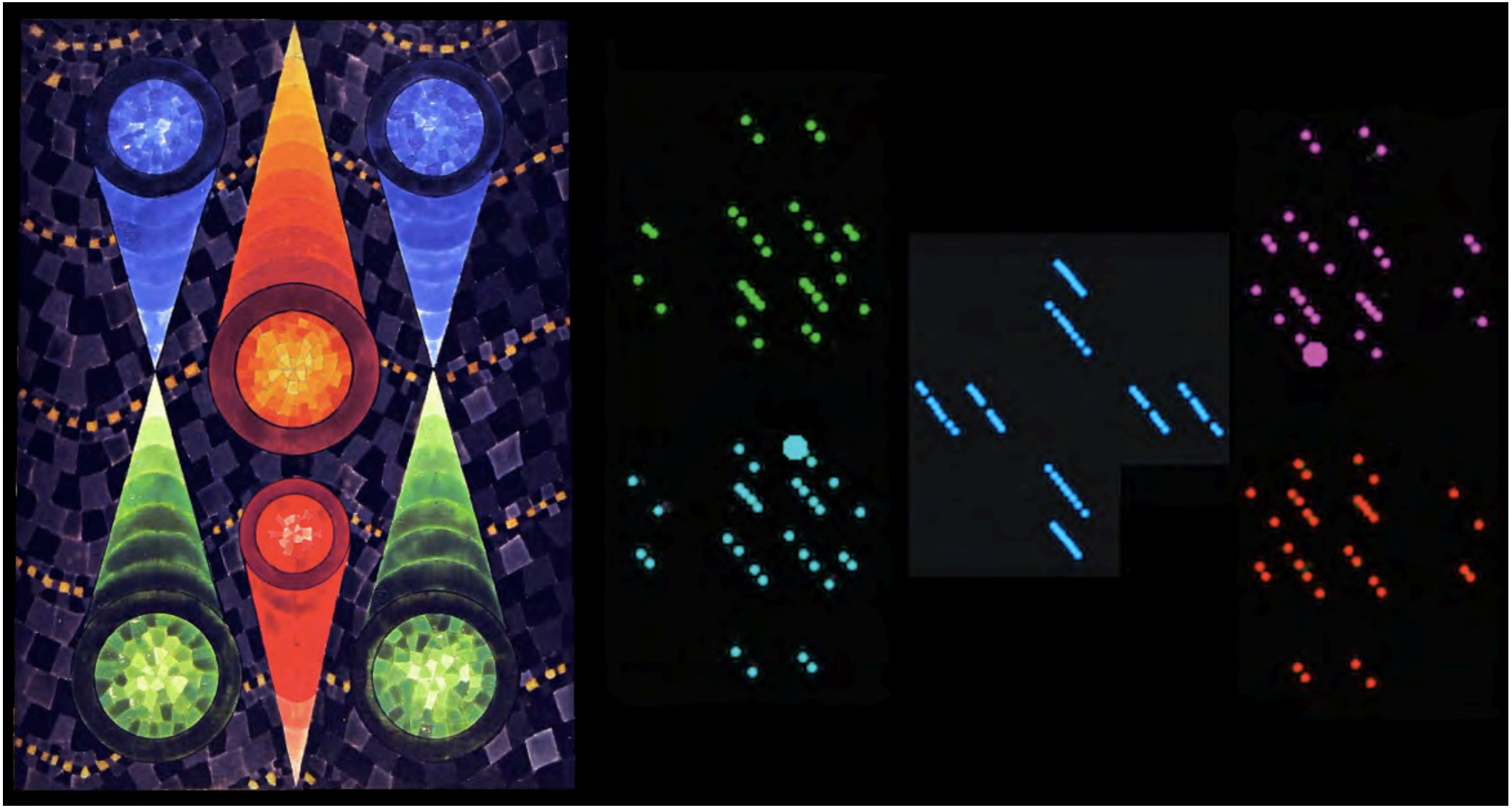
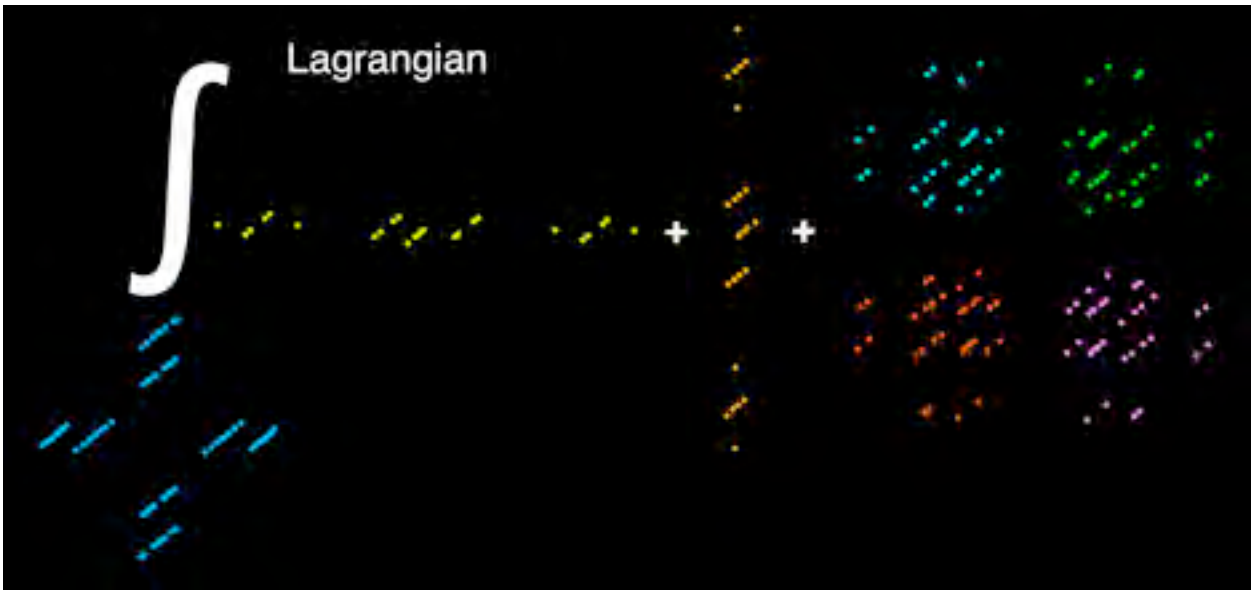



SU(3)
DQg
DQr
UQr
UQg
DQb
Nu
E
UQb
SU(2,2)
aUQab
P
aNu
aDQab
aUQag
aUQar
aDQar
aDQag
SU(2)


Lagrangian
D4
D4
E8 / D8
Spin(2,4)
Spin(2,3)
D8 / D4xD4
8D SpaceTime
SU(3)
SU(4)
SU(2)
M4 Physical SpaceTime
CP2 Internal Symmetry Space
the Octonionic Inflation Unfolding Process
creates Fermion Particles with no Antiparticles

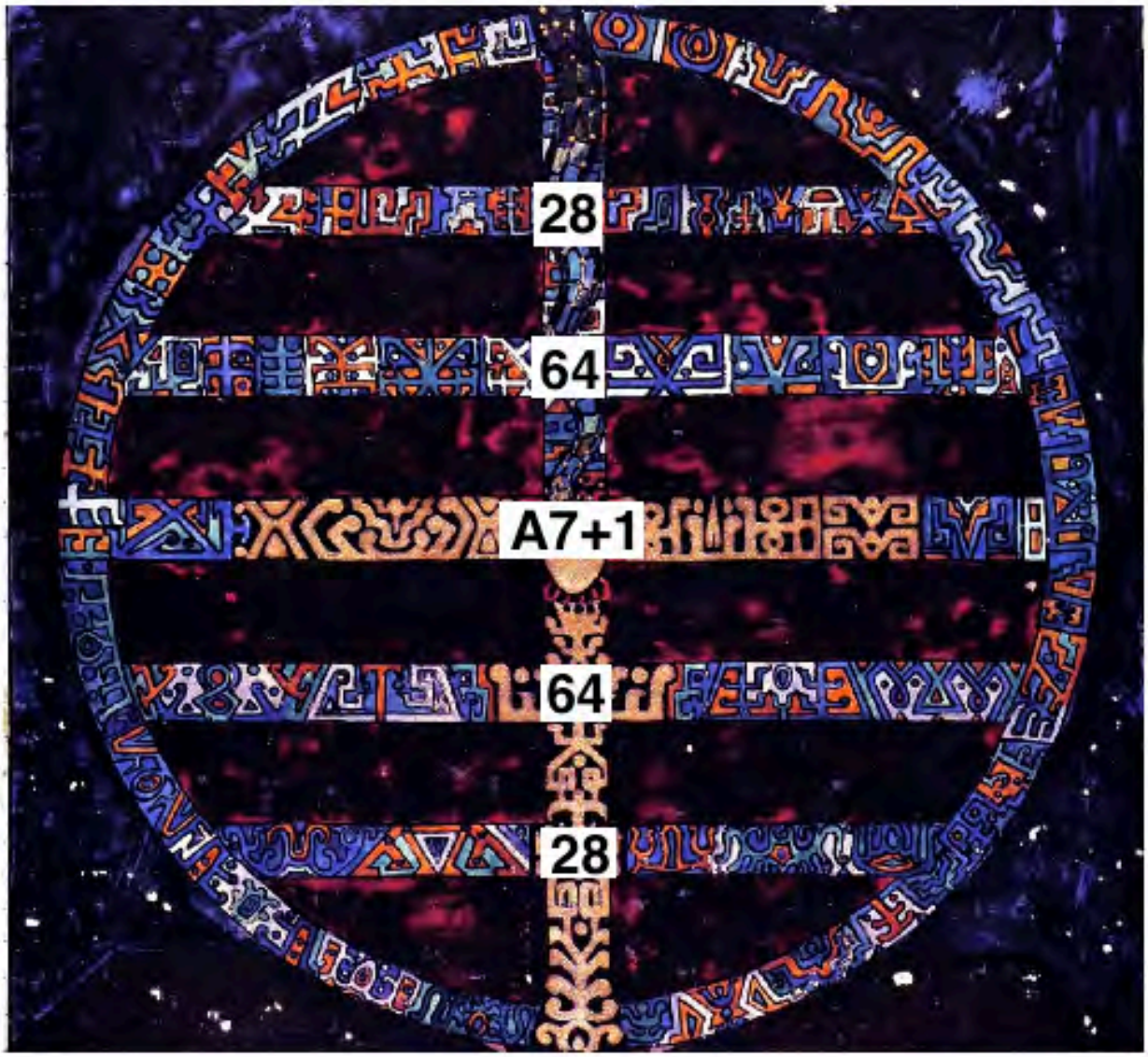




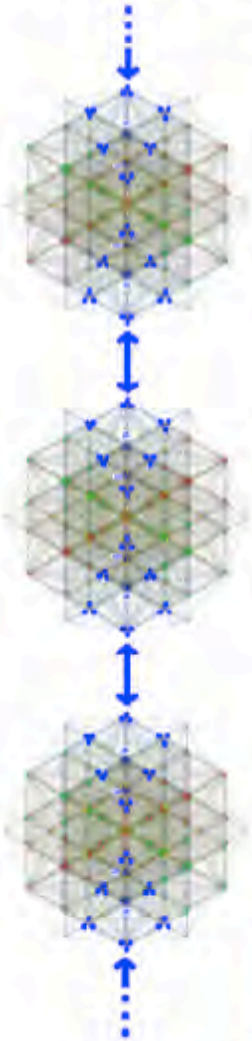
Creation-Annihilation Operators for 8 components of 8+8 Fermions
are
odd-grade-+/-1 part
of
E8 Maximal Contraction generalized Heisenberg Algebra

h92 x A7 = 28 + 64 + ((SL(8,R)+1) + 64 + 28

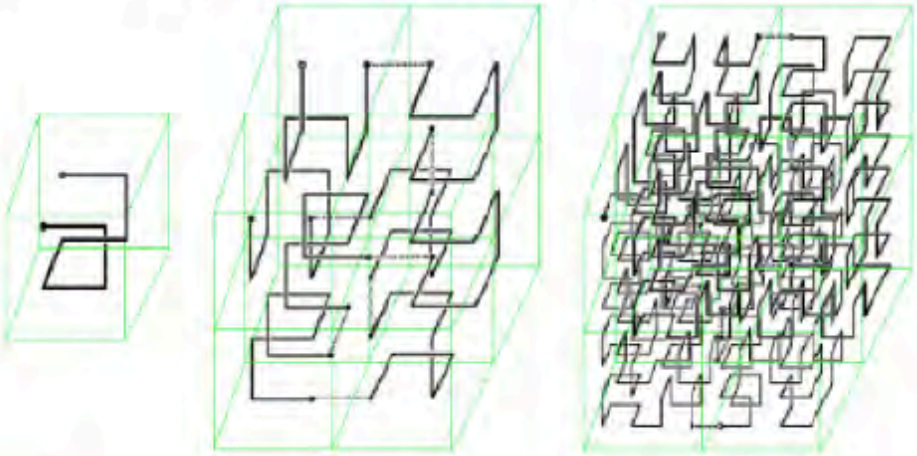
(see Rutwig Campoamor-Stursberg in Acta Physica Polonica B 41 (2010) 53-77 "Contractions of Exceptional Lie Algebras and SemiDirect Products")

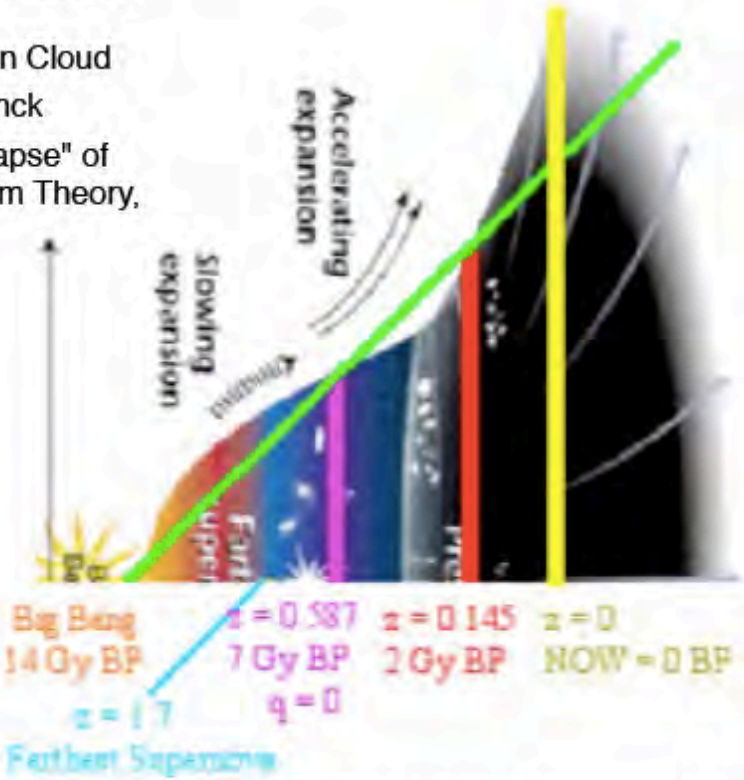

28
64
A7+1
64
28

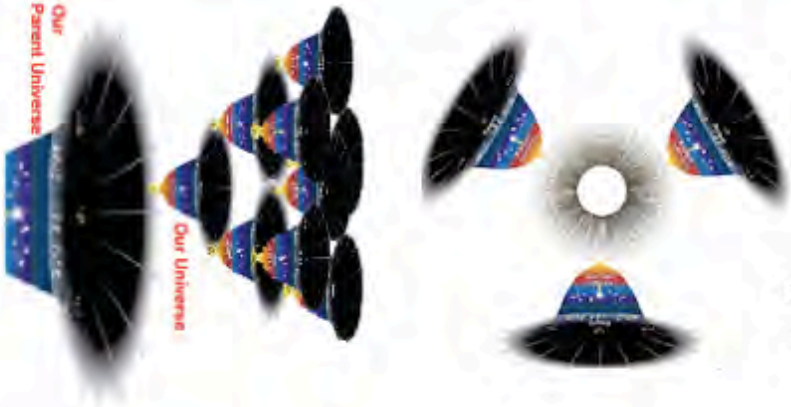
Big Bang E8(-248) : Spin(16) | Octonion Inflation E8(8) : SO(8,8) | Quaternion Conformal Evolution E8(-24) : SO*(16)



At the end of Non-Unitary Octonionic Inflation Our Universe
had about (1/2) 16^64 = (1/2) (2^4)^64 = 2^255 = 6 x 10^76 Fermion Particles
the size of our Universe was then about 10^(-24) cm
which is about the size of a Fermion Schwinger Source Kerr-Newman Cloud
The End of Inflation time was at about 10^(-34) sec = 2^64 Tplanck
The Zizzi Inflation phase of our universe ends with decoherence "collapse" of
the 2^64 Superposition Inflated Universe into Many Worlds of Quantum Theory,



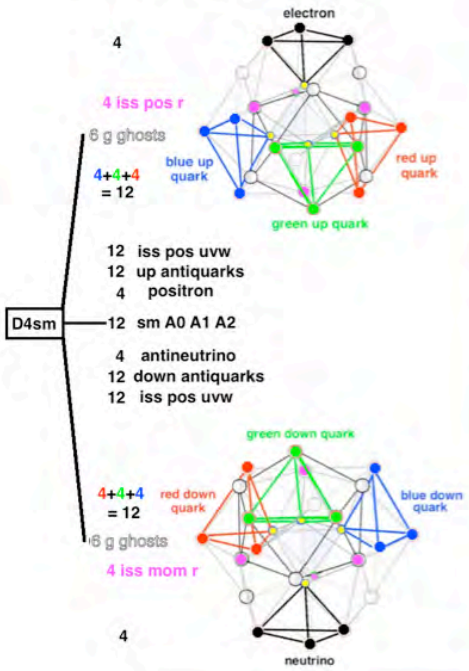


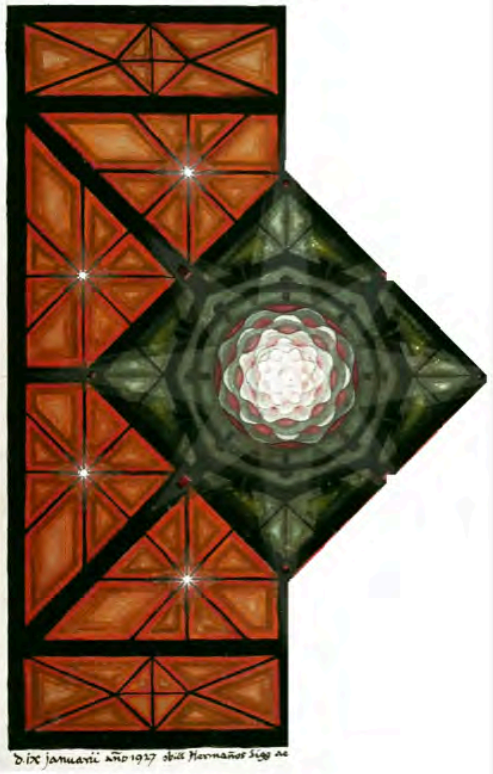


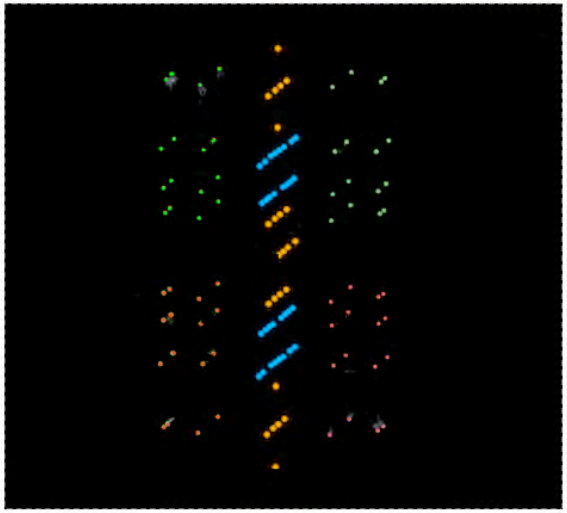
The ratio Dark Energy : Dark Matter : Ordinary Matter
for our Universe at the present time is calculated to be:
0.75 : 0.21 : 0.04

Paola Zizzi in gr-qc/0007006:
"... **The self-reduction of the superposed quantum state ...**
corresponds to a superposed state of ... [10^19 = 2^64 qubits]
... also the number of superposed tubulins-qubits in our brain
... leading to a conscious event. ...".

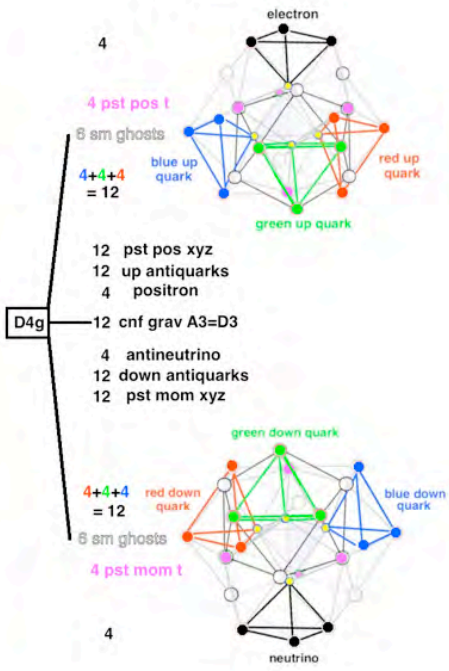
Standard Model 600-Cell
with
CP2 Internal Symmetry Space

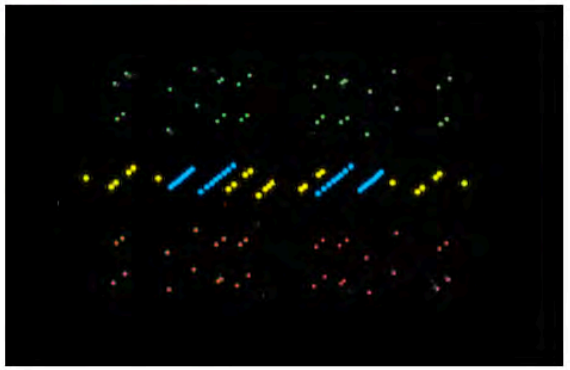




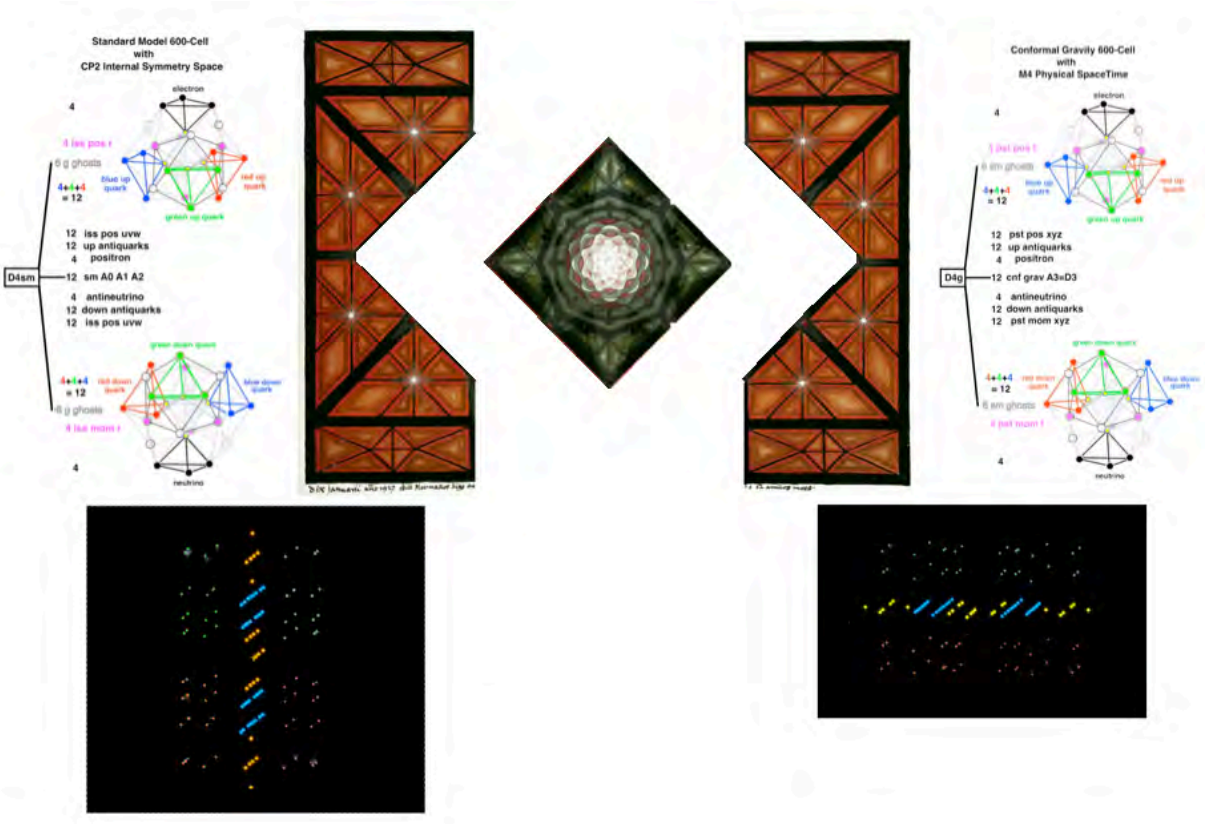


Conformal Gravity 600-Cell
with
M4 Physical SpaceTime

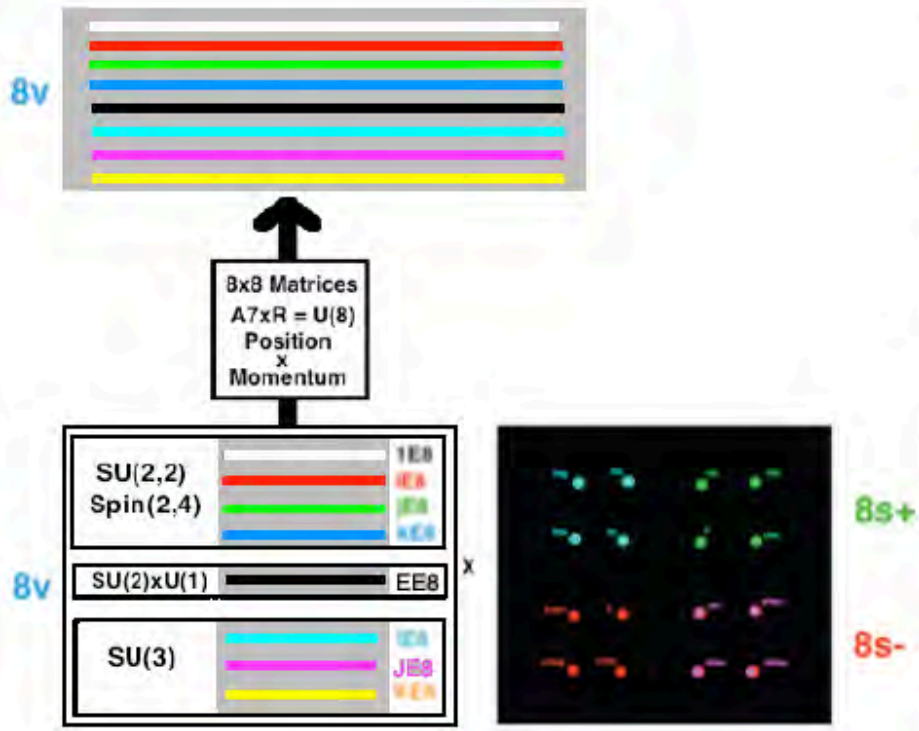




Inflation ends when a preferred Quaternionic Subspacetime freezes out,
converting 8 dim Spacetime into 4+4 dim M4 x CP2 Spacetime where
M4 = Physical Minkowski Spacetime and
CP2 = SU(3) / U(2) Internal Symmetry Space
Octonionic Integral becomes two Quaternionic Integrals



8-dim Octonionic Spacetime was broken into
(4+4)-dim Unitary Quaternionic M4 x CP2 Kaluza-Klein Spacetime
with SO*(16) symmetry of EIX E8(-24).
That transition was
a Weyl Unitary Trick within E8(8) from SO(8,8) to SO*(16)
followed by
a shifting of SO*(16) symmetry from E8(8) to E8(-24)
E8 form EIX E8(-24) with Symmetric Space E8 / SO*(16)
represents Our Universe after End of Inflation



Indra's Net of Schwinger Sources - Bohm Quantum Blockchain

The Cl(16)-E8 AQFT inherits structure from the Cl(16)-E8 Local Lagrangian

$\int$ Standard Model Gauge Gravity + Fermion Particle-AntiParticle

8-dim SpaceTime

the Cl(16)-E8 model at the Planck Scale has spacetime condensing out of Clifford structures forming a Leech lattice underlying 26-dim String Theory of World-Lines with 8 + 8 + 8 = 24-dim of fermion particles and antiparticles and of spacetime.

Slices of 8v SpaceTime are represented as D8 branes. Each D8 brane has Planck-Scale Lattice Structure superpositions of 8 types of E8 Lattice denoted by 1E8, iE8, jE8, kE8, EE8, IE8, JE8, KE8

Stack D8 branes to get SpaceTime with Strings = World-Lines

Let Oct16 = discrete mutiplicative group { +/-1, +/-i, +/-j, +/-k, +/-E, +/-I, +/-J, +/-K}.
Orbifold by Oct16 the 8s+ to get 8 Fermion Particle Types
Orbifold by Oct16 the 8s- to get 8 Fermion AntiParticle Types

Gauge Bosons from 1E8 and EE8 parts of a D8 give U(2) Electroweak Force
Gauge Bosons from IE8, JE8, and KE8 parts of a D8 give SU(3) Color Force
Gauge Bosons from 1E8, iE8, jE8, and kE8 parts of a D8 give U(2,2) Conformal Gravity

The 8x8 matrices for collective coordinates linking one D8 to the next D8 give Position x Momentum

The automorphism group of a single 26-dim String Theory cell modulo the Leech lattice is the Monster Group of order about 8 x 10^53.

When a fermion particle/antiparticle appearsTachyons create a cloud of particles/antiparticles. The cloud is one Planck-scale Fundamental Fermion Valence Particle plus an effectively neutral cloud of particle/antiparticle pairs forming a Kerr-Newman black hole. That cloud constitutes the Schwinger Source.

The Schwinger Sources are finite regions in a Complex Domain spacetime corresponding to Green's functions of particle creation / annihilation.

Its structure comes from the 24-dim Leech lattice part of the Monster Group which is 2^(1+24) times the double cover of Co1, for a total order of about 10^26.

(Since a Leech lattice is based on copies of an E8 lattice and since there are 7 distinct E8 integral domain lattices there are 7 (or 8 if you include a non-integral domain E8 lattice)mdistinct Leech lattices. The physical Leech lattice is a superposition of them, effectively adding a factor of 8 to the order.)

The volume of the Kerr-Newman Cloud is on the order of 10^27 x Planck scale, = roughly 10^(-24) cm.

Julian Schwinger describes Elementary Particles  as volumes of space - Sources - whose properties are determined by Green's Functions characteristic of the volumes.

In E8 Physics any Elementary Particle is immediately surrounded by a cloud of virtual particle-antiparticle pairs similar to a Kerr-Newman Black Hole with Symmetric Space - Bounded Complex Domain - Shilov Boundary structure corresponding to its Gauge Group properties.
The Poisson Kernel - Bergman Kernel defines the Green's Function.

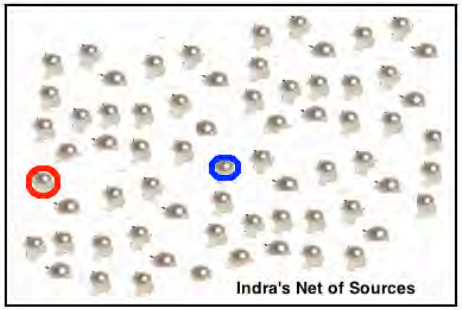
The initial Valence Particle is Planck scale. The number of Virtual Particles is determined by the Planck scale geometry of spacetime. The E8 model at the Planck Scale has spacetime condensing out of Clifford structures forming a Lorentz Leech lattice underlying 26-dim String Theory of World-Lines with 8 + 8 + 8 = 24-dim of fermion particles and antiparticles and of spacetime.
The automorphism group of one 26-dim String Theory cell modulo the Leech lattice is the Monster Group of order about 8 x 10^53.
The Cloud structure comes from the 24-dim Leech lattice part of the Monster Group which is 2^(1+24) times the double cover of Co1, for an order of about 10^26. Due to superpostions of algebraically independent E8 Lattices the total number of Virtual particle/ antiparticle pairs is about 10^27 so the volume of the Kerr-Newman Cloud is on the order of 10^27 x Planck scale, and its size should be about 10^(27/3) x 1.6 x 10^(-33) cm = roughly 10^(-24) cm.

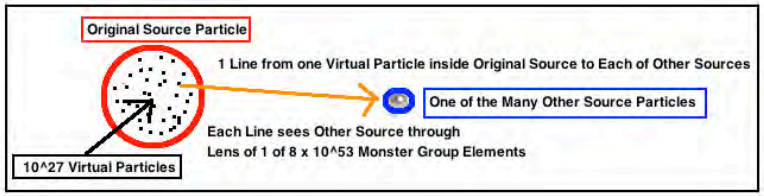
Each Schwinger Source particle-antiparticle pair should see (with Bohm Quantum Potential and Sarfatti Back-Reaction) the rest of our Universe in the perspective of 8 x 10^53 Monster Symmetry so a Schwinger Source acting as a Jewel of Indra's Net of Schwinger Source Bohm Quantum Blockchain Physics can see 10^27 x 8 x 10^53 = 8 x 10^80 Other Sources of an Indra's Net.

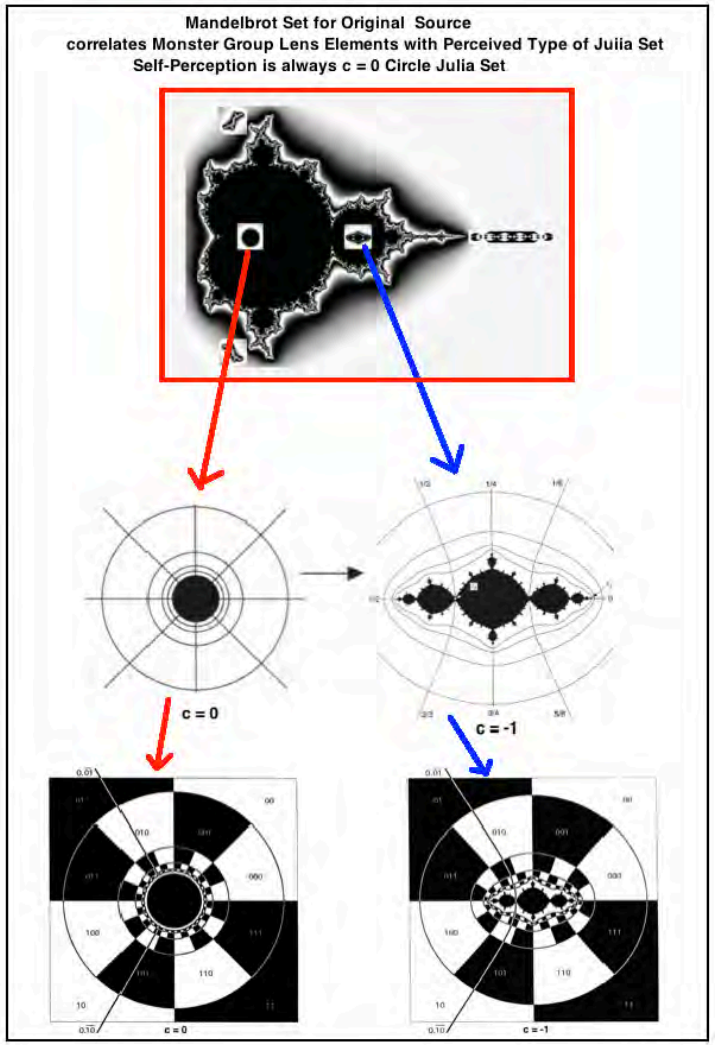
To fit inside the initial Schwinger Source the Information Elements of all the Other Schwinger Sources of Our Universe (10^77 or so) should be distributed as a Fractal Julia Set. There are 2^n stage-n cells in a Binary Decomposition of Julia Sets, so a stage-256 Julia level set based on Binary Decomposition has 2^256 = about 10^77 cells so Full Indra Net information can be seen / reflected by each Schwinger Source Indra Jewel.

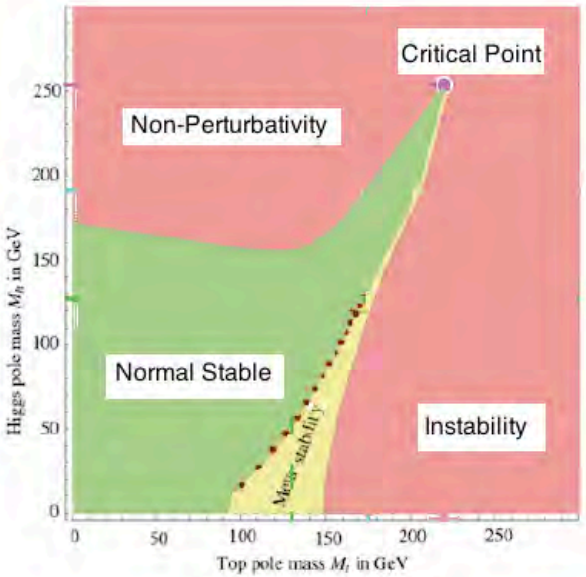
Each Schwinger Source contains 10^27 Virtual pairs of particles each of which can see along a connecting Line an Other Indra's Net Source which Line sees Other Sources through Monster Group Lens elements so that the Other Source appears to the Original Source to be a Julia Set.

Each Schwinger Source has a Mandelbrot Set that tells its Source what each of the many Indra's Net Source Julia set looks like by correlating Monster Group Lens Elements with Types of Julia Set. Self-Perception is always the c = 0 Circle Julia Set.





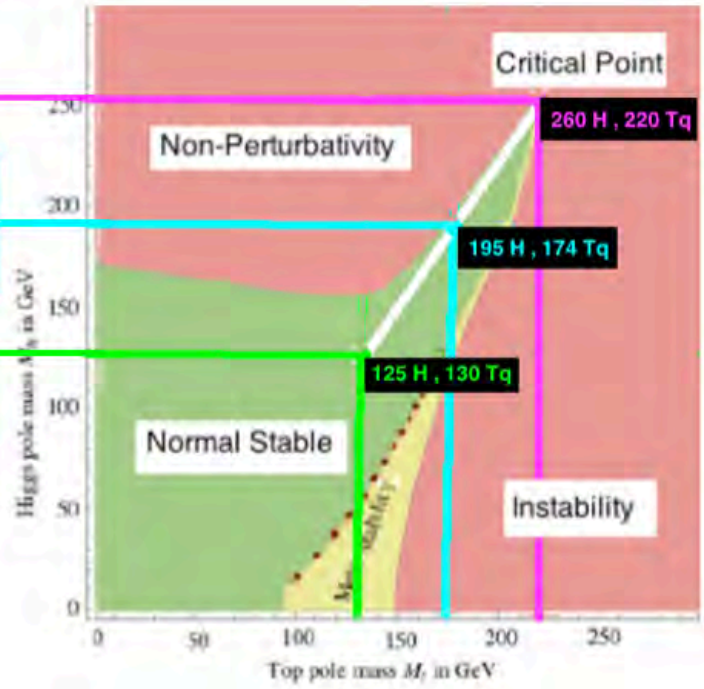


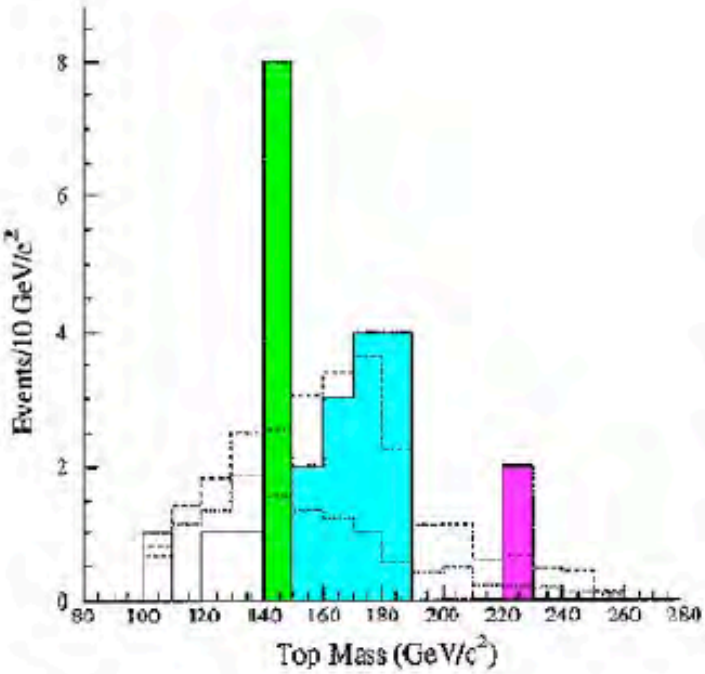


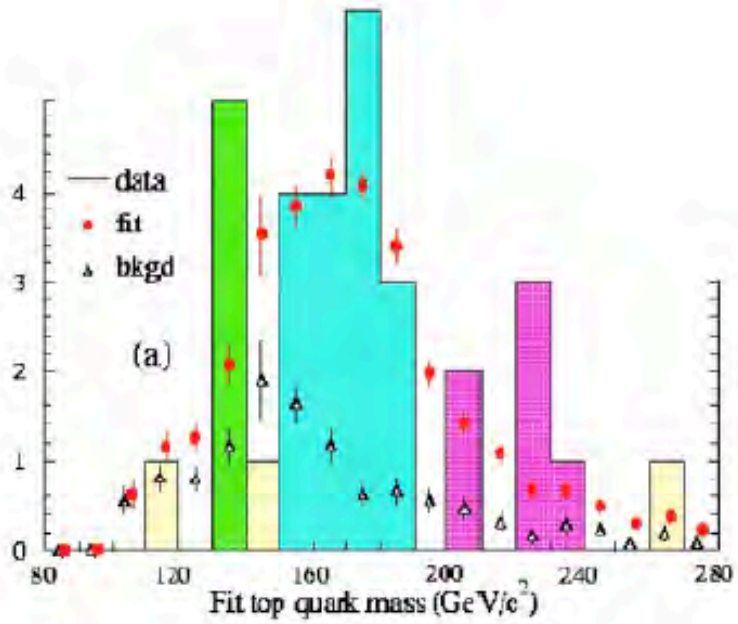
Critical Point
250 H , 220 Tq

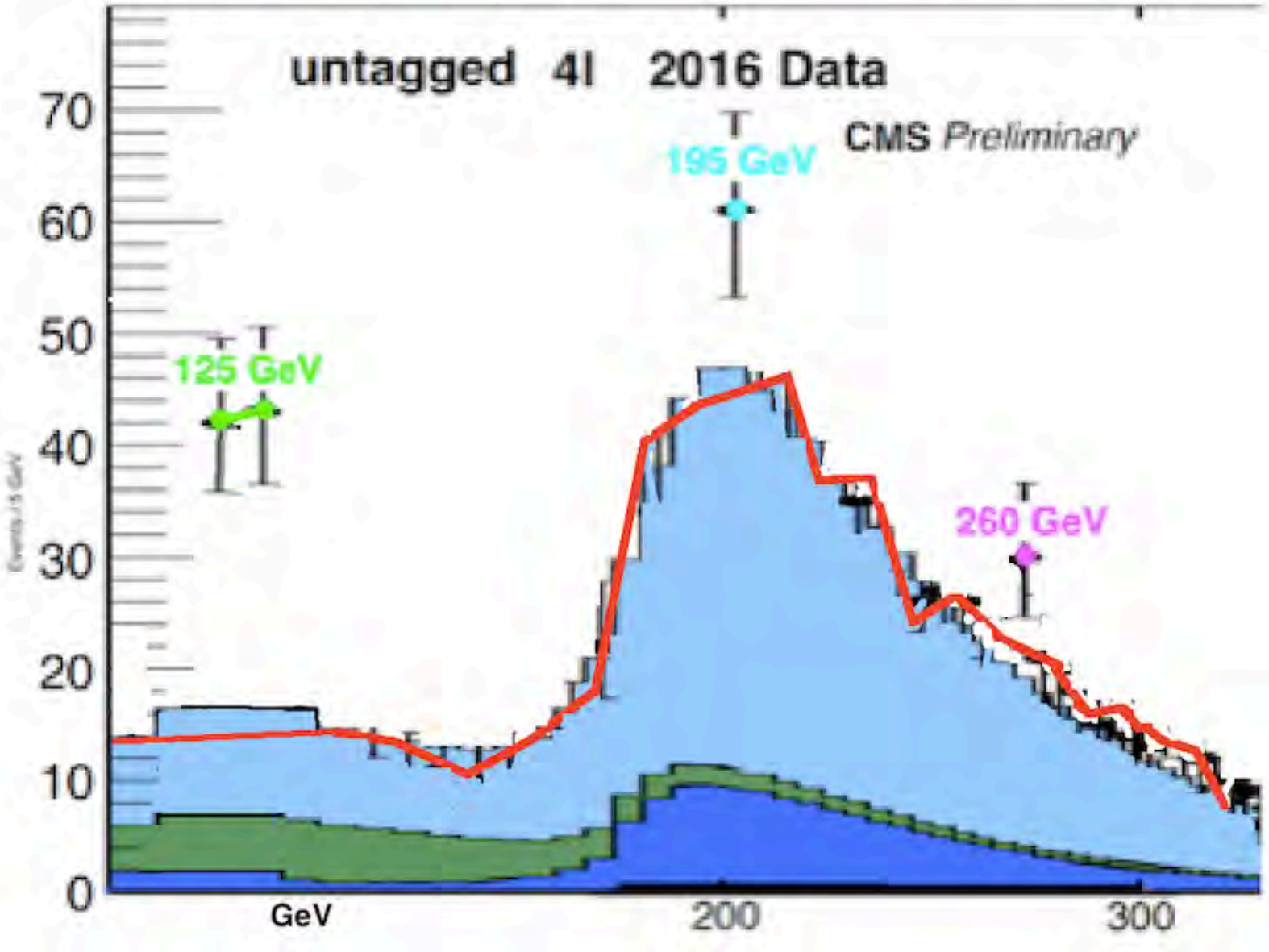
Non-Perturbativity 4+4 K-K
Composite H as Tq-Tantiq Condensate
195 H , 174 Tq

Normal Stable Ground State
125 H , 130 Tq

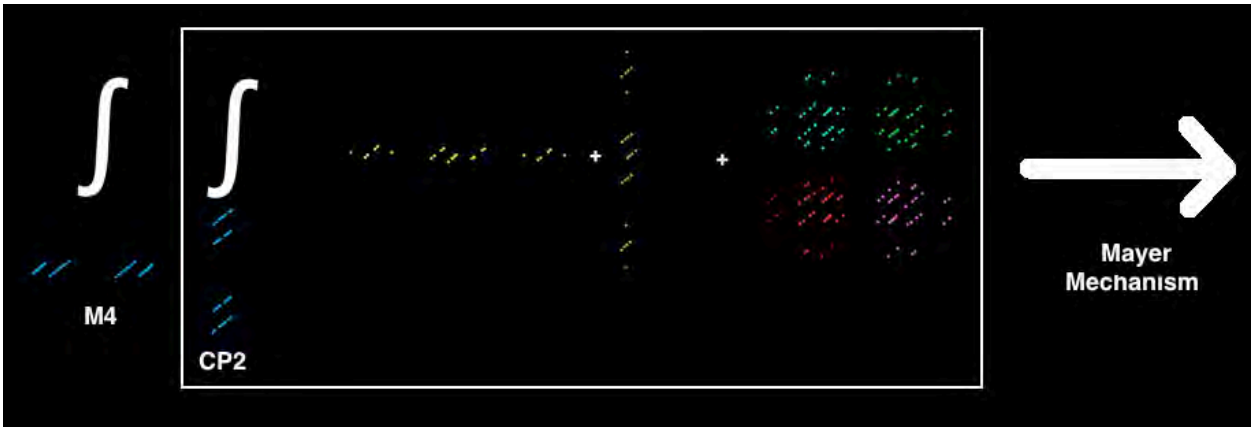


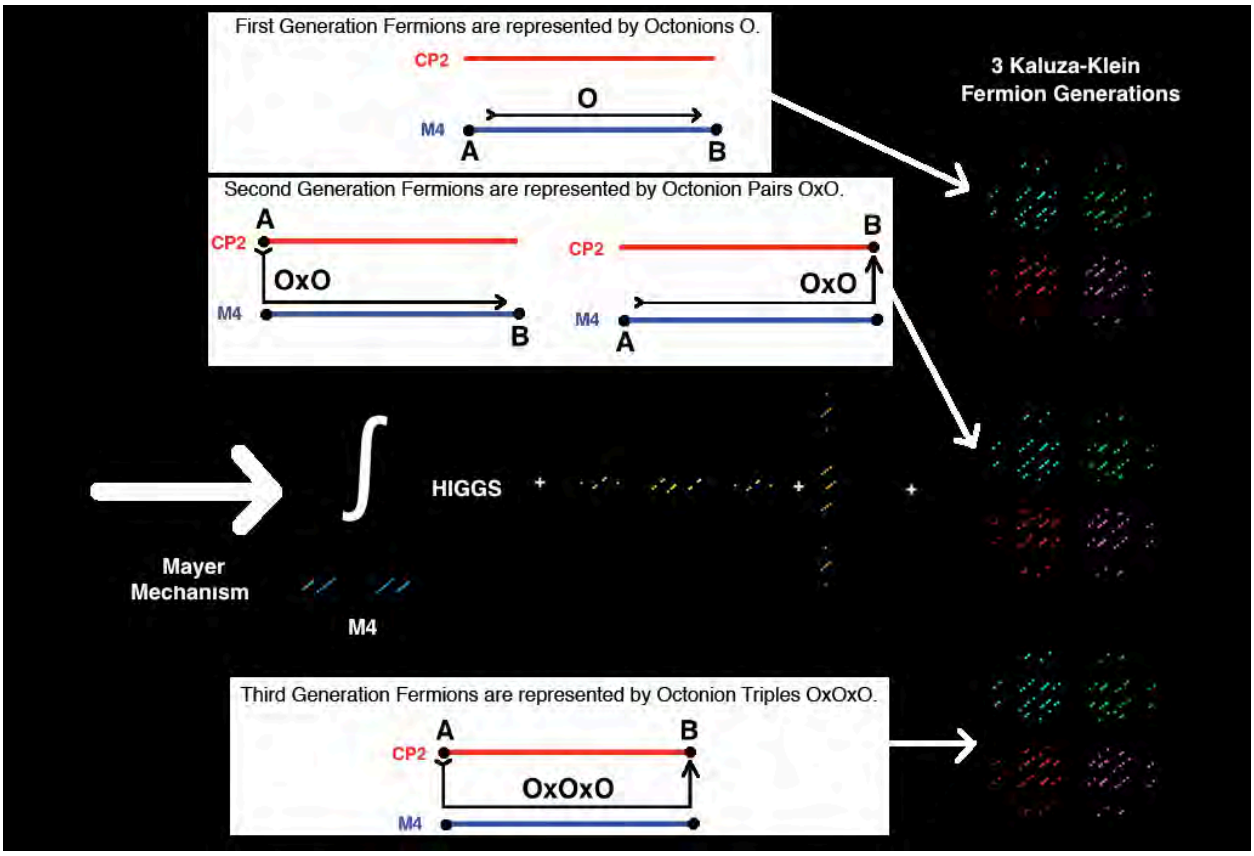

Events/10 GeV/c²
Top Mass (GeV/c²)


data
fit
bkgd
(a)
Fit top quark mass (GeV/c²)


untagged 4l 2016 Data
CMS Preliminary
195 GeV
125 GeV
260 GeV
GeV

Splitting Octonionic Spacetime into Quaternionic M4 x CP2 Kaluza-Klein over CP2 produces
Higgs by the Mayer Mechanism and
Second and Third Generation Fermions



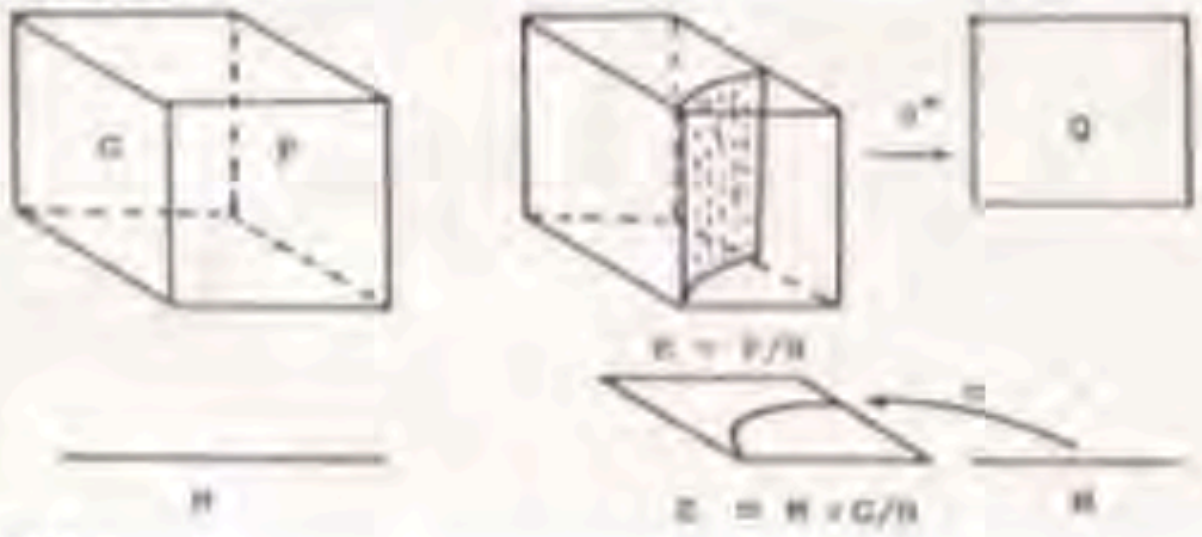


Quaternionic E7xSU(2) structure breaks 8-dim Spacetime Octonionic Symmetry to Quaternionic (4+4)-dim Associative x CoAssociative Kaluza-Klein Spacetime

(see Reese Harvey "Spinors and Calibrations" (Academic 1990))

where M4 = 4-dim Minkowski Physical Spacetime is Associative
and CP2 = SU(3) / SU(2) x U(1) Internal Symmetry Space is CoAssociative

Meinhard Mayer said (Hadronic Journal 4 (1981) 108-152): "... each point of ... the ... fibre bundle ... E ...



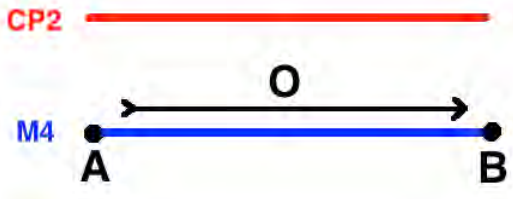
... consists of
a four- dimensional spacetime point x [in M4]
to which is attached the homogeneous space G / H [SU(3) / U(2) = CP2]
...
the components of the curvature lying in the homogeneous space G / H could be reinterpreted as Higgs scalars (with respect to spacetime [M4])
...
the Yang-Mills action reduces to a Yang-Mills action for the h-components [U(2) components] of the curvature over M [M4] and a quartic functional for the "Higgs scalars", which not only reproduces the Ginzburg-Landau potential, but also gives the correct relative sign of the constants, required for the BEHK ... Brout-Englert-Higgs-Kibble ... mechanism to work. ...".

(see Appendix - Details of Mayer - Higgs)

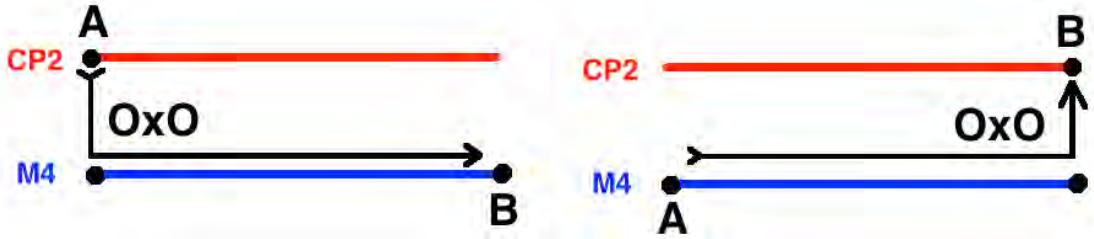
3 Generations of Fermions

In Kaluza-Klein M4 x CP2 there are 3 possibilities for a fermion represented by an Octonion O basis element to go from point A to point B:

1 - A and B are both in M4: First Generation Fermion
whose path can be represented by the single O basis element
so that First Generation Fermions are represented by Octonions O.



2 - Either A or B, but not both, is in CP2: Second Generation Fermion
whose path must be augmented by one projection from CP2 to M4,
which projection can be represented by a second O basis element
so that Second Generation Fermions are represented by Octonion Pairs OxO.



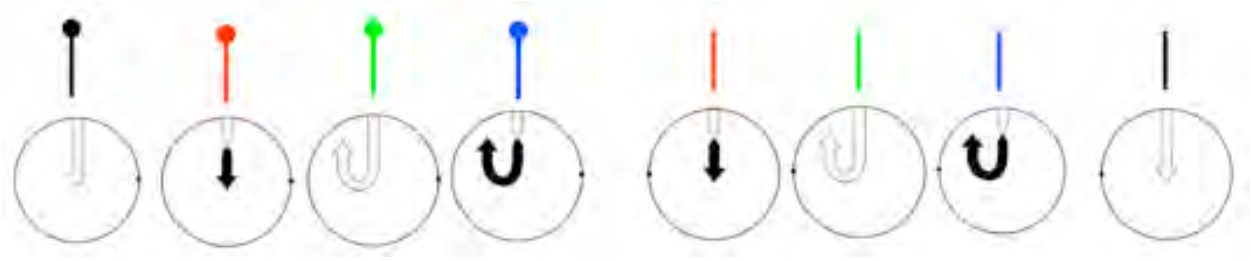
3 - Both A and B are in CP2: Third Generation Fermion
whose path must be augmented by two projections from CP2 to M4,
which projections can be represented by a second O and a third O,
so that Third Generation Fermions are represented by Octonion Triples OxOxO.

3 Generation Fermion Combinatorics

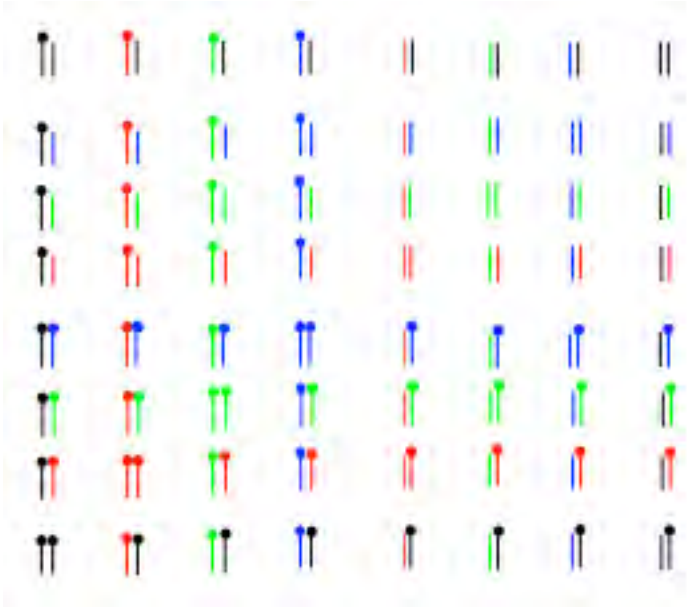
First Generation (8)

(geometric representation of Octonions is from arXiv 1010.2979)

electron	red up quark	green up quark	blue up quark	red down quark	green down quark	blue down quark	neutrino
E	I	J	K	i	j	k	1



Second Generation (64)



Mu Neutrino (1)
Rule: a Pair belongs to the Mu Neutrino if:
All elements are Colorless (black)
and all elements are Associative
(that is, is 1 which is the only Colorless Associative element) .

Muon (3)
Rule: a Pair belongs to the Muon if:
All elements are Colorless (black)
and at least one element is NonAssociative
(that is, is E which is the only Colorless NonAssociative element).

Blue Strange Quark **(3)**
Rule: a Pair belongs to the Blue Strange Quark if:
There is at least one Blue element and the other element is Blue or Colorless (black)
and all elements are Associative (that is, is either 1 or i or j or k).

Blue Charm Quark **(17)**
Rules: a Pair belongs to the Blue Charm Quark if:
1 - There is at least one Blue element and the other element is Blue or Colorless (black)
and at least one element is NonAssociative (that is, is either E or I or J or K)
2 - There is one Red element and one Green element (Red x Green = Blue).

(Red and Green Strange and Charm Quarks follow similar rules)

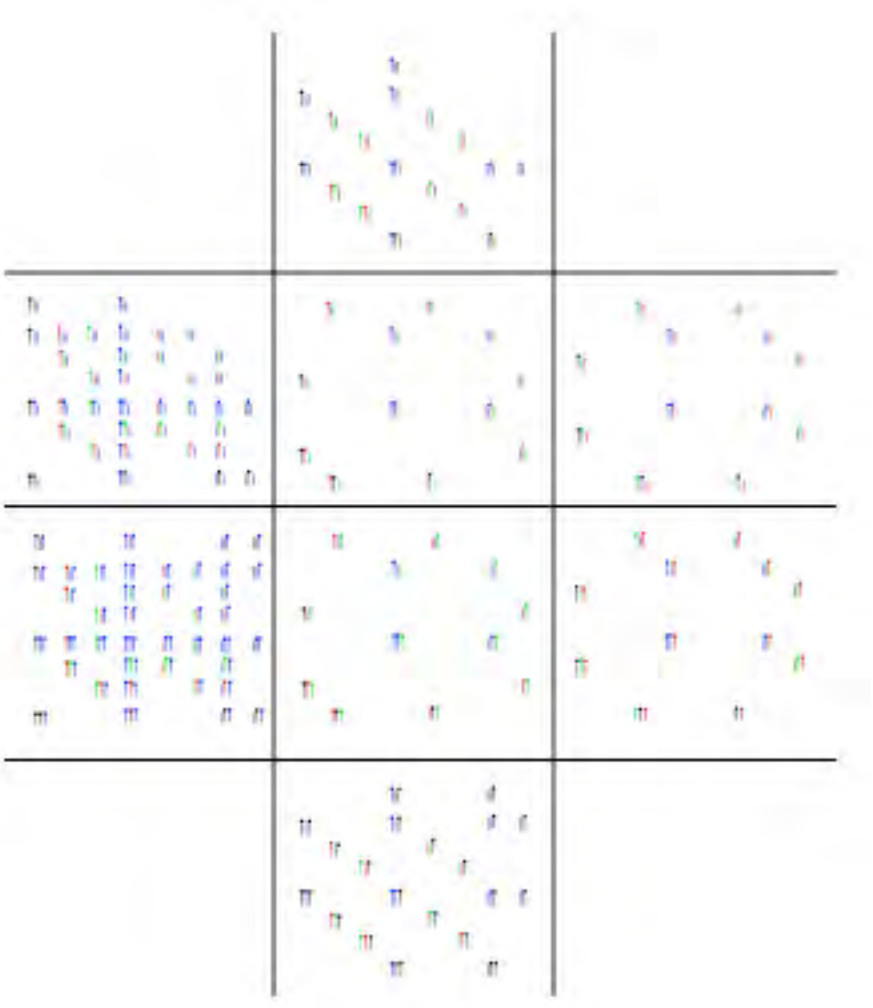
Third Generation (512)

Tau Neutrino (1)
Rule: a Triple belongs to the Tau Neutrino if:
All elements are Colorless (black)
and all elements are Associative
(that is, is 1 which is the only Colorless Associative element)

Tauon (7)
Rule: a Triple belongs to the Tauon if:
All elements are Colorless (black)
and at least one element is NonAssociative (that is, is E which is the only Colorless NonAssociative element)

Blue Beauty Quark (7)
Rule: a Triple belongs to the Blue Beauty Quark if:
There is at least one Blue element and all other elements are Blue or Colorless (black) and all elements are Associative (that is, is either 1 or i or j or k).

Blue Truth Quark (161)
Rules: a Triple belongs to the Blue Truth Quark if:
1 - There is at least one Blue element and all other elements are Blue or Colorless (black)
and at least one element is NonAssociative (that is, is either E or I or J or K)
2 - There is one Red element and one Green element and the other element is Colorless (Red x Green = Blue)
3 - The Triple has one element each that is Red, Green, or Blue,
in which case the color of the Third element (for Third Generation) is determinative and must be Blue.



(Red and Green Beauty and Truth Quarks follow similar rules)

Fermion masses are calculated as a product of four factors:

V(Qfermion) x N(Graviton) x N(octonion) x Sym

The ratio of the down quark spinor manifold volume factor
to the electron spinor manifold volume factor is

V(Qdown quark) / V(Qelectron) = V(S^7x RP^1)/1 = pi^5 / 3.

The third generation fermion particles correspond to triples of octonions.
There are 8^3 = 512 such triples.
The triple { 1,1,1 } corresponds to the tau-neutrino.
The other 7 triples involving only 1 and E correspond to the tauon:
{ E, E, E } { E, E, 1 } { E, 1, E } { 1, E, E } { 1, 1, E } { 1, E, 1 } { E, 1, 1 }
The symmetry of the 7 tauon triples is the same
as the symmetry of the first generation tree-level-massive fermions,
3 down, quarks, the 3 up quarks, and the electron,
so by the Sym factor the tauon mass should be the same as
the sum of the masses of the first generation massive fermion particles.
Therefore the **tauon mass is calculated at tree level as 1.877 GeV**.

The beauty quark corresponds to 21 triples.
They are triples of the same form as the 7 tauon triples involving 1 and E,
but for 1 and I, 1 and J, and 1 and K = red, green, and blue beauty quarks.
The seven red beauty quark triples correspond to the seven tauon triples,
except that the beauty quark interacts with 6 Spin(0,5) gravitons
while the tauon interacts with only two.
The red beauty quark constituent mass should be the tauon mass times
the third generation graviton factor 6/2 = 3,
so the **red beauty quark mass is mb = 5.63111 GeV**.

Triples of the type { 1, I, J } , { I, J, K }, etc.,
do not correspond to the beauty quark, but to the truth quark.
The truth quark corresponds to those 512 - 1 - 7 - 21 = 483 triples,
so the constituent mass of the red truth quark
is 161 / 7 = 23 times the red beauty quark mass,
and the **red T-quark mass is mt = 129.5155 GeV**

248-dim E8 contains 120-dim D8

E8 / D8 = 64 + 64 Fermions

D8 / D4 x D4 = 64 Spacetime

D4 = 28 Standard Model (12)
with 16 Gravity + Dark Energy Ghosts

D4 = 28 Gravity + Dark Energy (16)
with 12 Standard Model Ghosts

D4 of Standard Model Gauge Bosons and Gravity Ghosts

The 24 orange are Root Vectors of
the CP2-related D4 local isotropy group in the symmetric space D8 / D4 x D4
that acts on the CP2 Internal Symmetry Space of Kaluza-Klein M4 x CP2

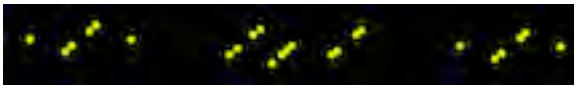
8 orange are Root Vectors for Standard Model SU(3) x SU(2) x U(1)
which have 2+1+1 = 4 Cartan SubAlgebra dimensions.

Standard Model Gauge groups come from CP2 = SU(3) / SU(2) x U(1)
(as described by Batakis in Class. Quantum Grav. 3 (1986) L99-L105)

Electroweak SU(2) x U(1) is gauge group as isotropy group of CP2.

SU(3) is global symmetry group of CP2 but due to Kaluza-Klein structure of compact CP2 at every M4 spacetime point, it acts as Color gauge group with respect to M4.

D4 of Conformal Gravity and Standard Model Ghosts

The 24 yellow  are Root Vectors of
the M4-related D4 local isotropy group in the symmetric space D8 / D4 x D4
that acts on the M4 Internal Symmetry Space of Kaluza-Klein M4 x CP2

12 yellow are Root Vectors for Conformal Gravity U(2,2)
which has 4 Cartan SubAlgebra dimensions.

Gravity and Dark Energy come from its Conformal Subgroup SU(2,2) = Spin(2,4)
(see Appendix - Details of Conformal Gravity and ratio DE : DM :OM)

SU(2,2) = Spin(2,4) has 15 generators:

1 Dilation representing Higgs Ordinary Matter

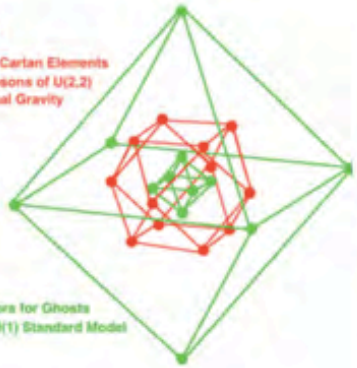
4 Translations representing Primordial Black Hole Dark Matter

10 = 4 Special Conformal + 6 Lorentz representing Dark Energy
(see Irving Ezra Segal, “Mathematical Cosmology and Extragalactic Astronomy” (Academic 1976))

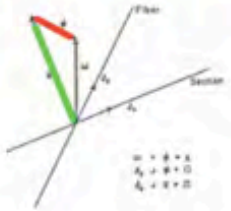
The basic ratio Dark Energy : Dark Matter : Ordinary Matter = 10:4:1 = 0.67 : 0.27 : 0.06
When the dynamics of our expanding universe are taken into account, the ratio is
calculated to be **0.75 : 0.21 : 0.04**

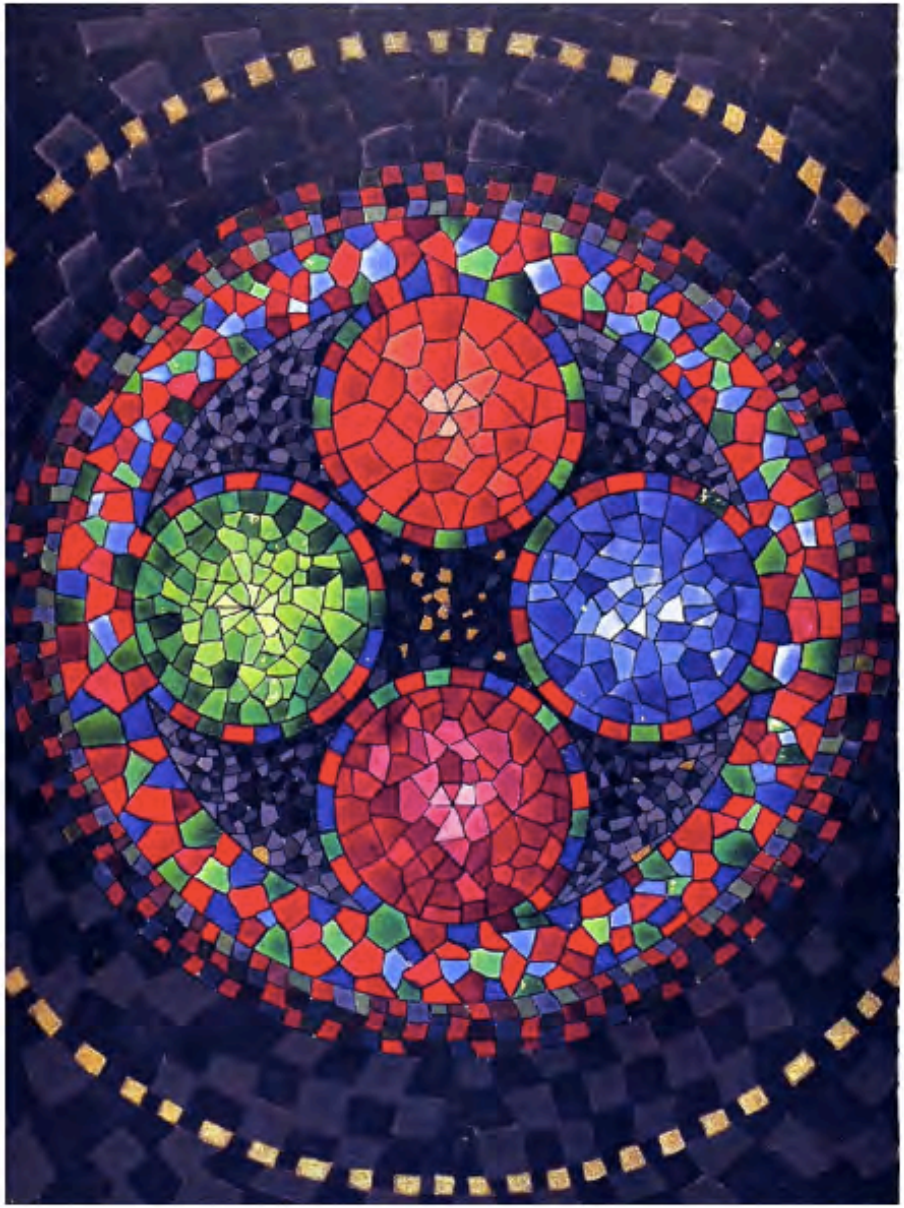
D4

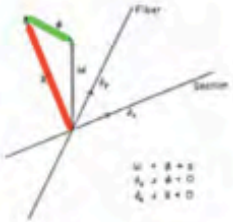
12 Root Vectors + 4 Cartan Elements
for 16 Gauge Bosons of U(2,2)
for Conformal Gravity



12 Root Vectors for Ghosts
of SU(3)xSU(2)xU(1) Standard Model

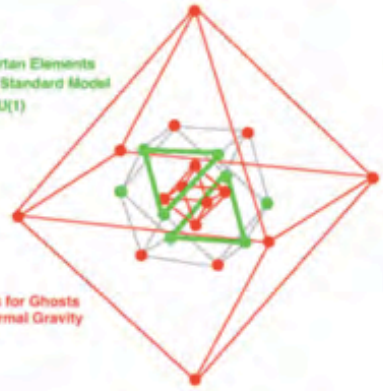






D4

8 Root Vectors + 4 Cartan Elements
for 12 Gauge Bosons of Standard Model
SU(3)xSU(2)xU(1)



16 Root Vectors for Ghosts
of U(2,2) Conformal Gravity

The force strength of a given force is

(1 / Mforce^2) (Vol(MISforce)) (Vol(Qforce) / Vol(Dforce)^(1 / mforce))

where:

Mforce represents the effective mass;

MISforce represents the relevant part of the target Internal Symmetry Space;

Vol(MISforce) stands for volume of MISforce and is sometimes also denoted by Vol(M);

Qforce represents the link from the origin to the relevant target for the gauge boson;

Vol(Qforce) stands for volume of Qforce;

Dforce represents the complex bounded homogeneous domain
of which Qforce is the Shilov boundary;

mforce is the dimensionality of Qforce, which is

Vol(Dforce)^(1 / mforce) stands for a dimensional normalization factor
(to reconcile the dimensionality of the Internal Symmetry Space of the target vertex
with the dimensionality of the link from the origin to the target vertex).

Qforce, Hermitian symmetric space, Dforce, mforce, and Vol(Dforce) for four forces are:

Spin(5)	Spin(7) / Spin(5)xU(1)	IV5	4	RP^1xS^4
SU(3)	SU(4) / SU(3)xU(1)	B^6(ball)	4	S^5
SU(2)	Spin(5) / SU(2)xU(1)	IV3	2	RP^1xS^2
U(1)	-	-	1	-

Force	M	Vol(M)	Q	Vol(Q)	D	Vol(D)
gravity	S^4	8pi^2/3	RP^1xS^4	8pi^3/3	IV5	pi^5/2^4 5!
color	CP^2	8pi^2/3	squashed S^5	4pi^3	B^6(ball)	pi^3/6
Weak	S^2xS^2	2x4pi	RP^1xS^2	4pi^2	IV3	pi^3/24
e-mag	T^4	4x2pi	-	-	-	-

squashed S5 = Shilov boundary of complex domain of symmetric space SU(4) / SU(3) x U(1)

The relative force strengths at the characteristic energy level of each force are:

Spin(5) gravity at 10^19 GeV = 1 ; GGmproton^2 approx 5 x 10^-39

SU(3) color at 245 MeV = 0.6286

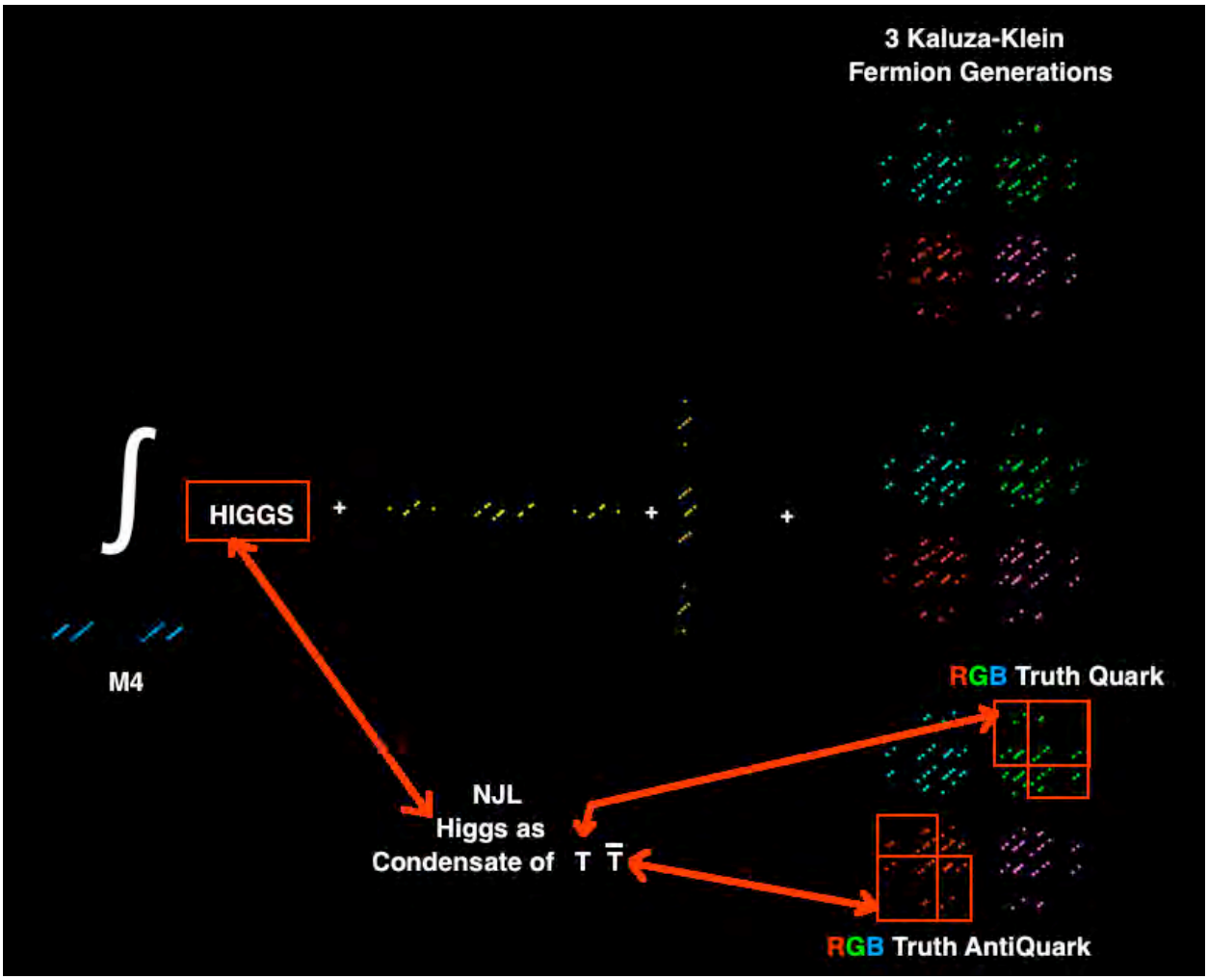
at 5.3 GeV = 0.166

at 34 GeV = 0.121

at 91 GeV = 0.106 ; with nonperturbative effects = 0.125

SU(2) weak at 100 GeV = 0.2535 ; GWmproton^2 approx 1.05 x 10^-5

U(1) e-mag at 4 KeV = 1/137.03608



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They are triples of the same form as the 7 tauon triples involving 1 and E,
but for 1 and I, 1 and J, and 1 and K,
which correspond to the red, green, and blue beauty quarks,
Triples of the type { 1, I, J } , { I, J, K }, etc.,
do not correspond to the beauty quark, but to the Truth quark.
The Truth quark corresponds to those 512 - 1 - 7 - 21 = 483 triples, so the
constituent mass of red truth quark is 161 / 7 = 23 times red beauty quark mass,
red Truth quark mass is mt = 129.5155 GeV

Here is a summary of E8 Physics model calculation results. Since ratios are calculated, values for one particle mass and one force strength are assumed.
Quark masses are constituent masses. Most of the calculations are tree-level, so more detailed calculations might be even closer to observations.

Dark Energy : Dark Matter : Ordinary Matter = 0.75 : 0.21 : 0.04

Fermions as Schwinger Sources have geometry of Complex Bounded Domains with Kerr-Newman Black Hole structure size about 10^(-24) cm.

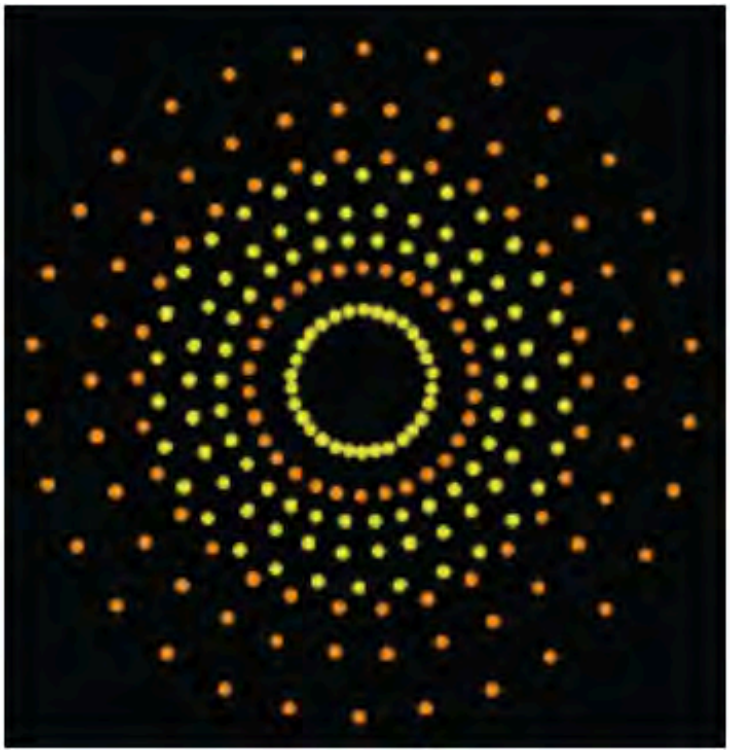
Particle/Force	Tree-Level	Higher-Order
e-neutrino	0	0 for nu_1
mu-neutrino	0	9 x 10^(-3) eV for nu_2
tau-neutrino	0	5.4 x 10^(-2) eV for nu_3
electron	0.5110 MeV	
down quark	312.8 MeV	charged pion = 139 MeV
up quark	312.8 MeV	proton = 938.25 MeV
		neutron - proton = 1.1 MeV
muon	104.8 MeV	106.2 MeV
strange quark	625 MeV	
charm quark	2090 MeV	
tauon	1.88 GeV	
beauty quark	5.63 GeV	
truth quark (low state)	130 GeV	(middle state) 174 GeV
		(high state) 218 GeV
W+	80.326 GeV	
W-	80.326 GeV	
W0	98.379 GeV	Z0 = 91.862 GeV
Mplanck 1.217x10^19 GeV		
Higgs VEV (assumed)	252.5 GeV	
Higgs (low state)	126 GeV	(middle state) 182 GeV
		(high state) 239 GeV
Gravity Gg (assumed)	1	
(Gg)(Mproton^2 / Mplanck^2)		5 x 10^(-39)
EM fine structure	1/137.03608	
Weak Gw	0.2535	
Gw(Mproton^2 / (Mw+^2 + Mw-^2 + Mz0^2))		1.05 x 10^(-5)
Color Force at 0.245 GeV	0.6286	0.106 at 91 GeV

Kobayashi-Maskawa parameters for W+ and W- processes are:

	d	s	b
u	0.975	0.222	0.00249 -0.00388i
c	-0.222 -0.000161i	0.974 -0.0000365i	0.0423
t	0.00698 -0.00378i	-0.0418 -0.00086i	0.999

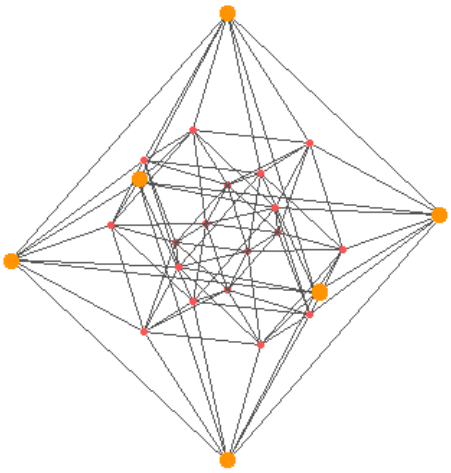
The phase angle d13 is taken to be 1 radian.

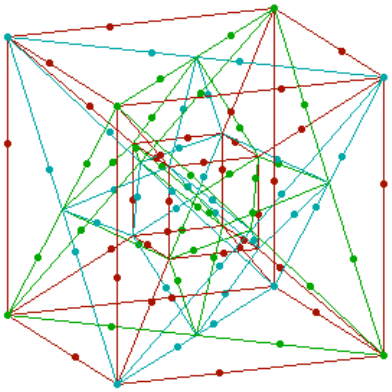
E8 = H4 + H4 = 120 + 120 = 240-vertex Witting polytope tiling of 8-dim space



E8 = 120 BiVectors + 128 half-Spinors of Cl(16) Clifford Algebra
with graded structure
1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1
By 8-Periodicity of Real Clifford Algebras: Cl(16) = tensor product Cl(8) x Cl(8)
so with that product E8 = F4 x F4

H4 = 24 (vertices) + 96 (edges) = 120-vertex 600-cell tiling of 4-dim space
with Coxeter Group determined by E8



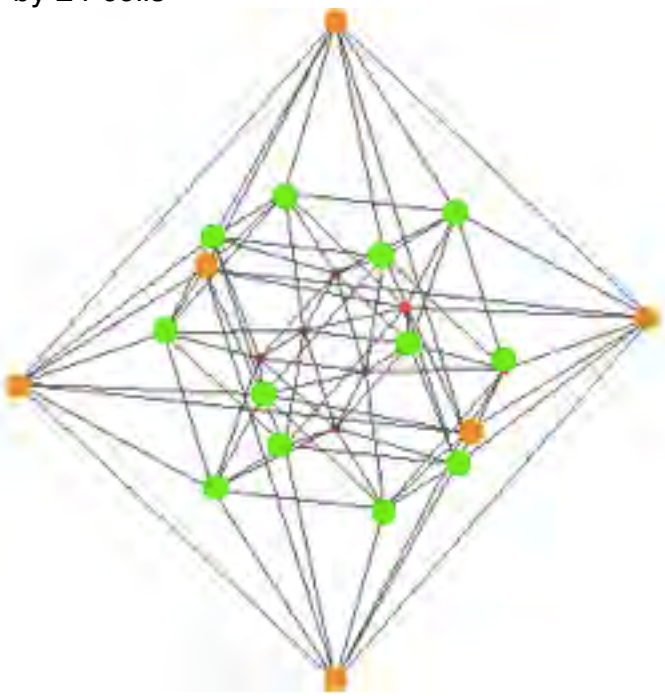


F4 = 24 cell + dual 24-cell tiling of 4-dim space

F4 = 8 Vectors + 28 BiVectors + 16 Spinors of Cl(8) Clifford Algebra
with graded structure 1 8 28 56 70 56 28 8 1
tile 4-dim space by 24-cells and their dual 24-cells

D4 24-cell tiling of 4-dim space

D4 = 28 BiVectors of Cl(8) Clifford Algebra with 24 root vectors
with graded structure 1 8 28 56 70 56 28 8 1
tile 4-dim space by 24-cells



A3 = D3 = cuboctahedral tiling of 3-dim space

A3=D3 = 15 BiVectors of Cl(6) Clifford Algebra with 12 root vectors and
with graded structure 1 6 15 20 15 6 1
tile 3-dim space by cuboctahedra
which can be seen as a central part of a 24-cell (green vertices above)

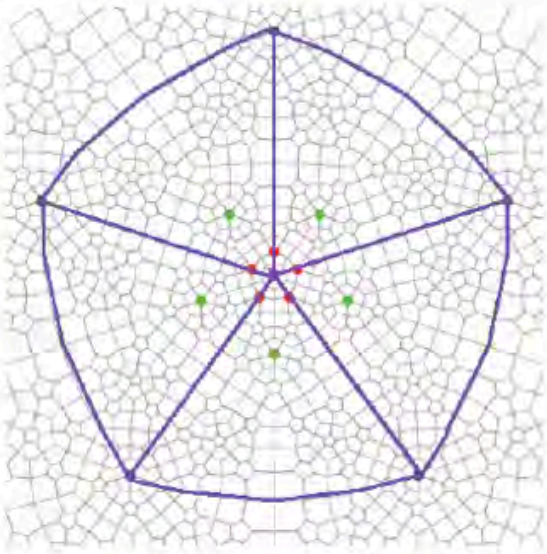
H3 = 12-Vertex Icosahedron as Jitterbug Transform of 12-Vertex Cuboctahedron

with Coxeter Group determined by D6

H2 Penrose STAR tilings of 2-dim space

H2 = I^5_2 = Penrose STAR tiling of 2-dim space
with Coxeter group determined by A4 which contains A2
and field extension Q(sqrt(5))

The central part of the tiling has 5 pentagonal sectors

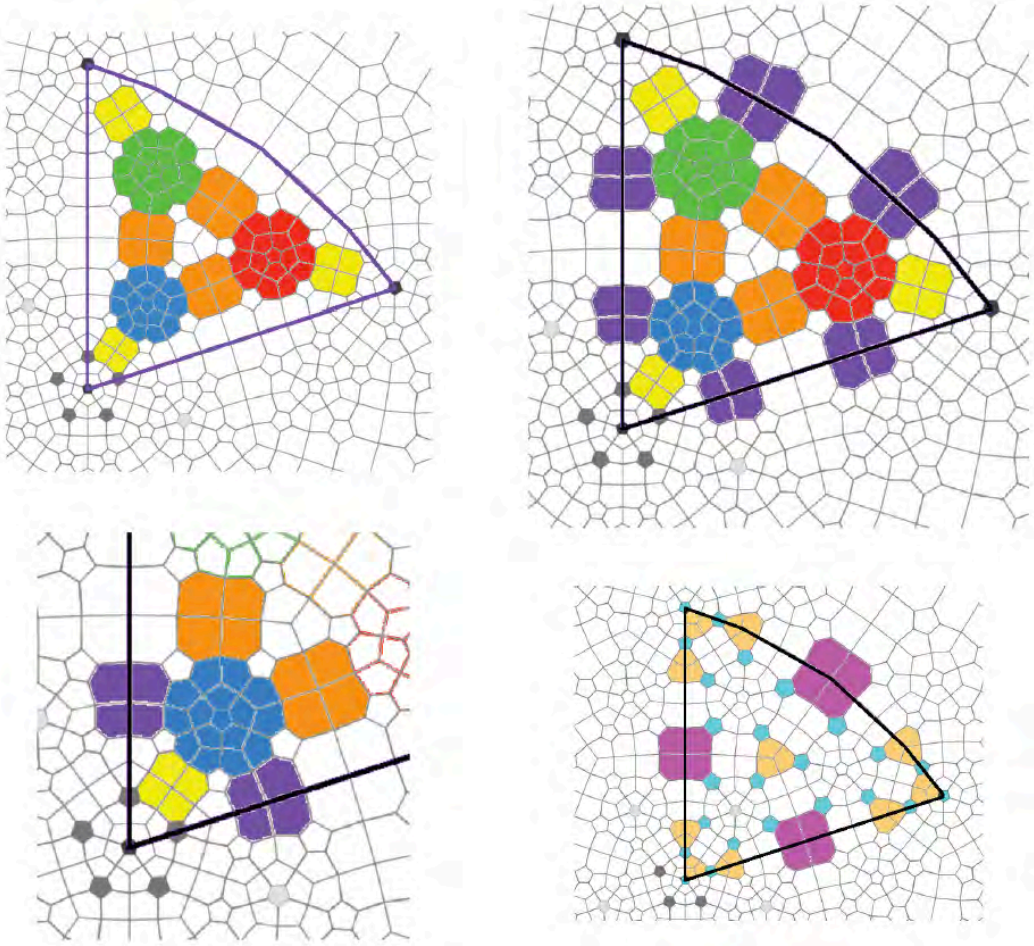


Each of the 5 pentagonal sectors of the tiling contains a 2-dim projected version of the 8-dim E8 Root Vector structure of E8 Physics corresponding to the Complex E6 subalgebra of Octonionic E8. The outer boundary of each sector is not a straight line but is curved with Conformal Symmetry and pentagonal sectors further out are conformally curved rather than straight-line pentagons.

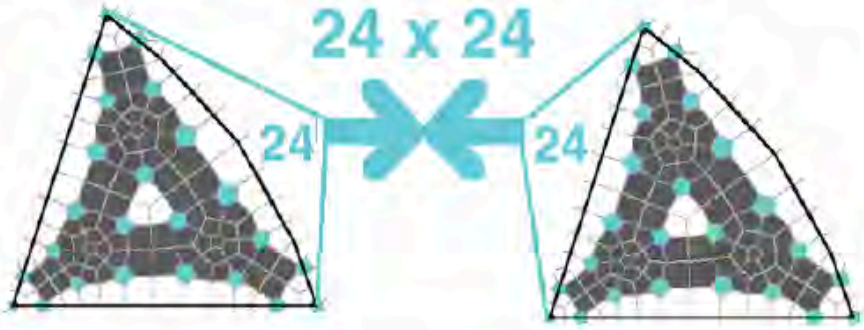
Each pentagonal sector represents the Complex part of Octonionic E8 Physics whose 240 E8 Root Vectors project to the 72 Root Vectors of E6 subalgebra of E8 which 72 E6 Root Vectors have the following physical interpretation

16 = 2x8 of which represent Complex Fermion Particles
16 = 2x8 of which represent Complex Fermion AntiParticles
16 = 2x(4+4) of which represent Complex (4+4)-dim Kaluza-Klein SpaceTime
12 of which represent the Standard Model
12 of which represent Gravity + Dark Energy

as shown in the following image of one of the pentagonal sectors:



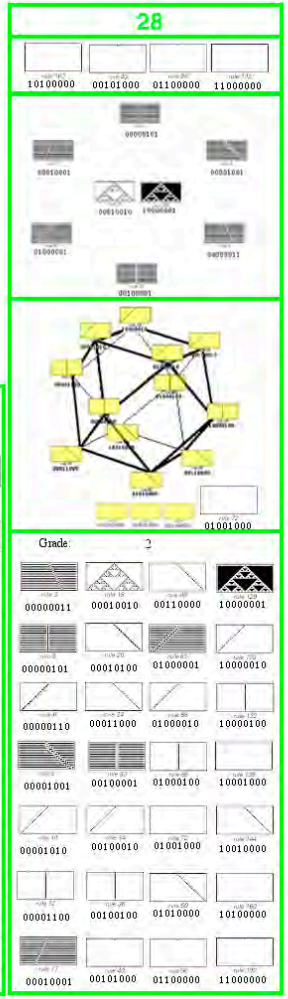
The Bohm Quantum Potential interacts between two Pentagonal Sectors by
24 Bohm Carrier Tiles of one Pentagonal Sector carrying E8 Configuration Information
and comparing it with
24 Bohm Carrier Tiles of the Other Sector carrying E8 Configuration Information.
If the resulting 24 x 24 Matrix shows that the two E8 Configurations are similar,
then a Bohm Quantum Potential Resonant Connection is established.



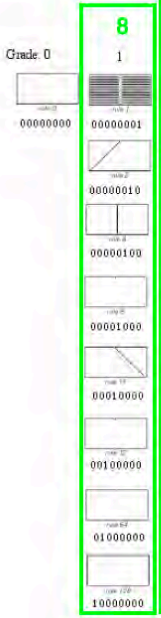
The Bohm Quantum Potential 24x24 Matrix is traceless because Configuration
Resonance is sensitive to similarity rather than dilation scale
and is symmetric because Configuration Resonance is symmetric between Sectors.

256-dim Cl(8) as Cellular Automata

28



8



8+28+16 = 52 F4

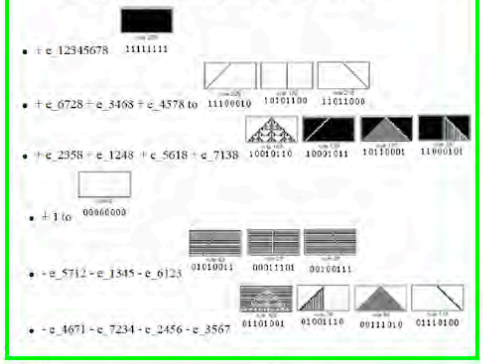
16

Cl(8) Primitive Idempotent has 16 Terms

I = (1/2)(1 + e_1248) (1/2)(1 + e_2358) (1/2)(1 + e_3468) (1/2)(1 + e_4578) =

=(1/16)(1 + e_1248 + e_2358 + e_3468 + e_4578 + e_5618 + e_6728 + e_7138 - e_3567 - e_4671 - e_5712 - e_6123 - e_7234 - e_1345 - e_2456 + e_J)

corresponding to 16 of the 256 Cellular Automata



Tensor Product Cl(8) x Cl(8) = Cl(16)

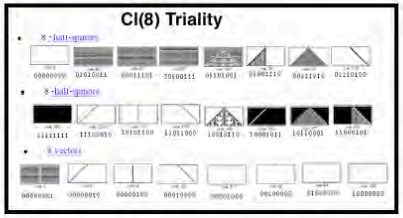
(F4 in Cl(8)) x (F4 in Cl(8)) =

= 8x8 + 28x1 + 1x28 + 16x16 =

= 120 Cl(16) BiVectors + (128 + 128) Cl(16) Spinors

120 Cl(16) BiVectors + 128 Cl(16) Half-Spinors = E8

Cl(8) Triality

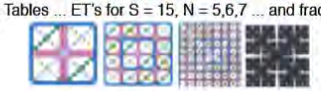


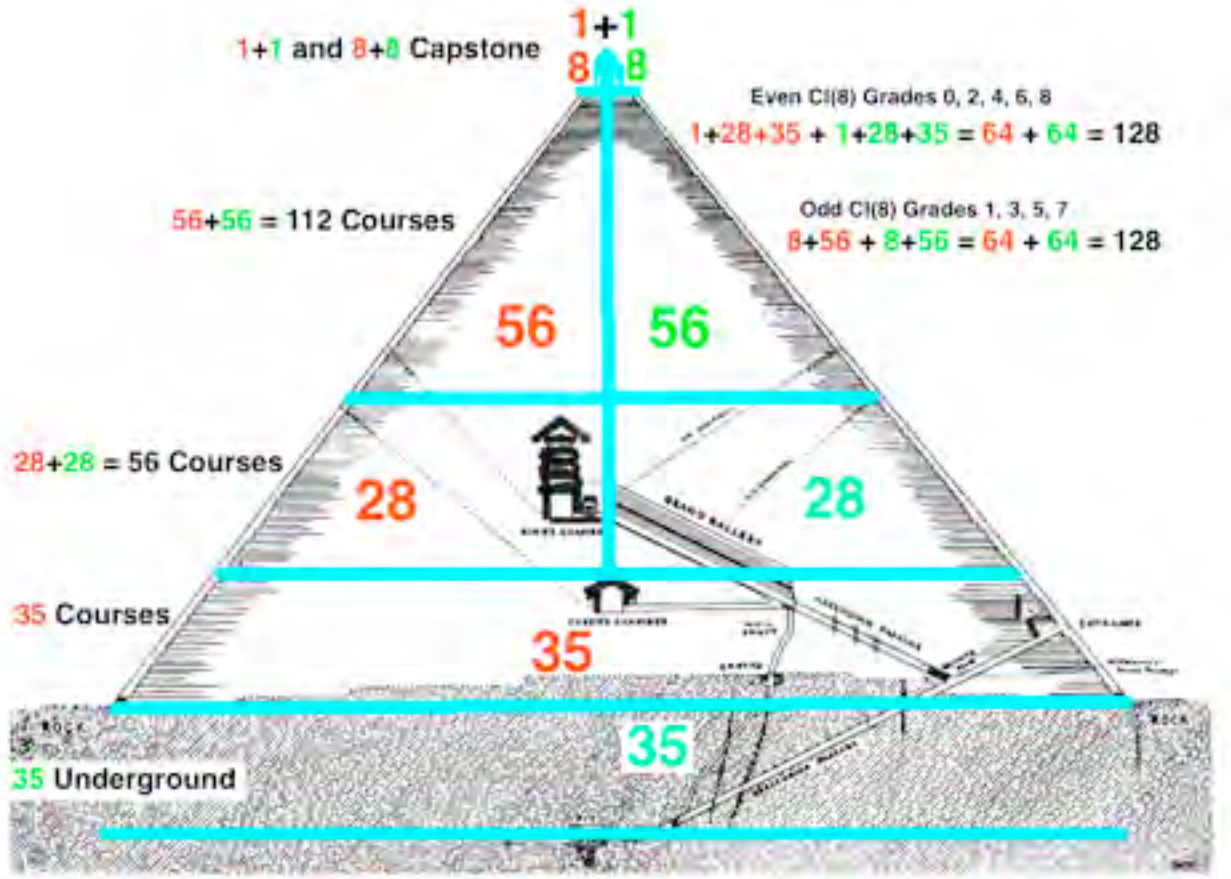
Guillermo Moreno (arXiv math/0512517) has shown that **V(7,2) = Spin(7) / Spin(5)** can be identified with the **Zero Divisors of Sedenions** which have 7+28 = 35 Associative Triples and for which Zero Divisors are given by the fibration V(7,2) -> G2 -> S3 [3-sphere] and which have 4-2=2 ZD Irreducible Components and 10-dim Lie Sphere Spin(7) / Spin(5)xU(1) whose 10D correspond to **Cl(1,9) = Cl(2,8) Conformal over Cl(1,7)** that **V(15,2) = Spin(15) / Spin(13)** is related to, but not identified with, the **Zero Divisors of 32-ons** which have 35 + 120 = 155 Associative Triples and which have 8-2=6 ZD Irreducible Components and 26-dim Lie Sphere Spin(15) / Spin(13)xU(1) whose 26D correspond to **26D String Theory and to 26-dim traceless J(3,O)o** that **V(127,2) = Spin(127) / Spin(125)** is related to, but not identified with, the **Zero Divisors of Voudon 256-ons** corresponding to Cl(8) which have 1+6+28+120+496+2016+8128=10795 Associative Triples and which have 64-2=62 ZD Irreducible Components and 250-dim Lie Sphere Spin(127) / Spin(125)xU(1)

Robert de Marrais said "... 256 ... 2^8 ions Voudons ... Moreno ... determines that the automorphism group of the ZD's of all 2^n-ions ... obey a simple pattern: for n ≥ 4 this group has the form G2 x (n-3) x S3 (... order-6 permutation group on 3 elements) ... This says the automorphism group of the Sedenions' ZD's has order 14 x 1 x 6 = 84 ... based on 7 octahedral lattices ("Box-Kites") ...

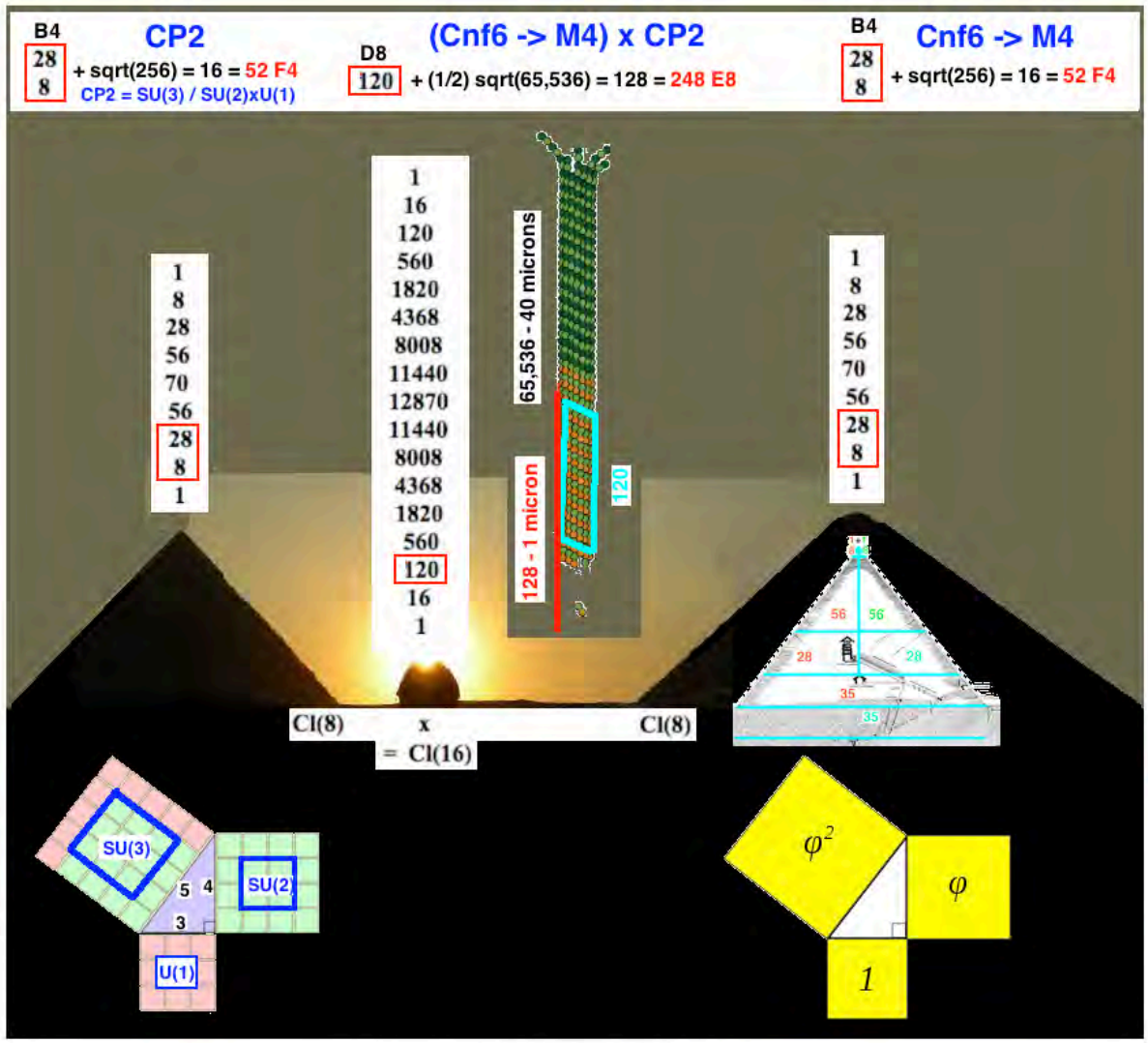
... Harmonics of Box-Kites, called here "Kite-Chain Middens," ... extend indefinitely into higher forms of 2^n -ions. All non-Midden-collected ZD diagonals in the ... 32-ons ... belong... to a set of 15 "emanation tables," ... they house 168 ... PSL(2,7) ... cells ... 8 ... 32-ons ,,, ET's ... from S = 8 to 15 ...

[here are] ... Emanation Tables ... ET's for S = 15, N = 5,6,7 ... and fractal limit ...





1 + 8 + 28 + 56 + (35 + 35) + 56 + 28 + 8 + 1



52-dim F4 of CP2 in 256-dim Cl(8)

F4 / B4 = OP2 = Spinor Fermions =
= 8 Particles + 8 AntiParticles
B4 / D4 = 8-dim SpaceTime =
= Kaluza-Klein M4 x CP2
D4 = Spin(8) contains Spin(6) = SU(4)
contains SU(3) Color Force
SU(3) Color Force = Global Symmetry
of CP2 = SU(3) / SU(2)xU(1)
SU(2)xU(1) ElectroWeak Force =
= Local Symmetry of CP2

Cross section

256
x
256
= 65,536

52-dim F4 of Cnf6 -> M4 in 256-dim Cl(8)

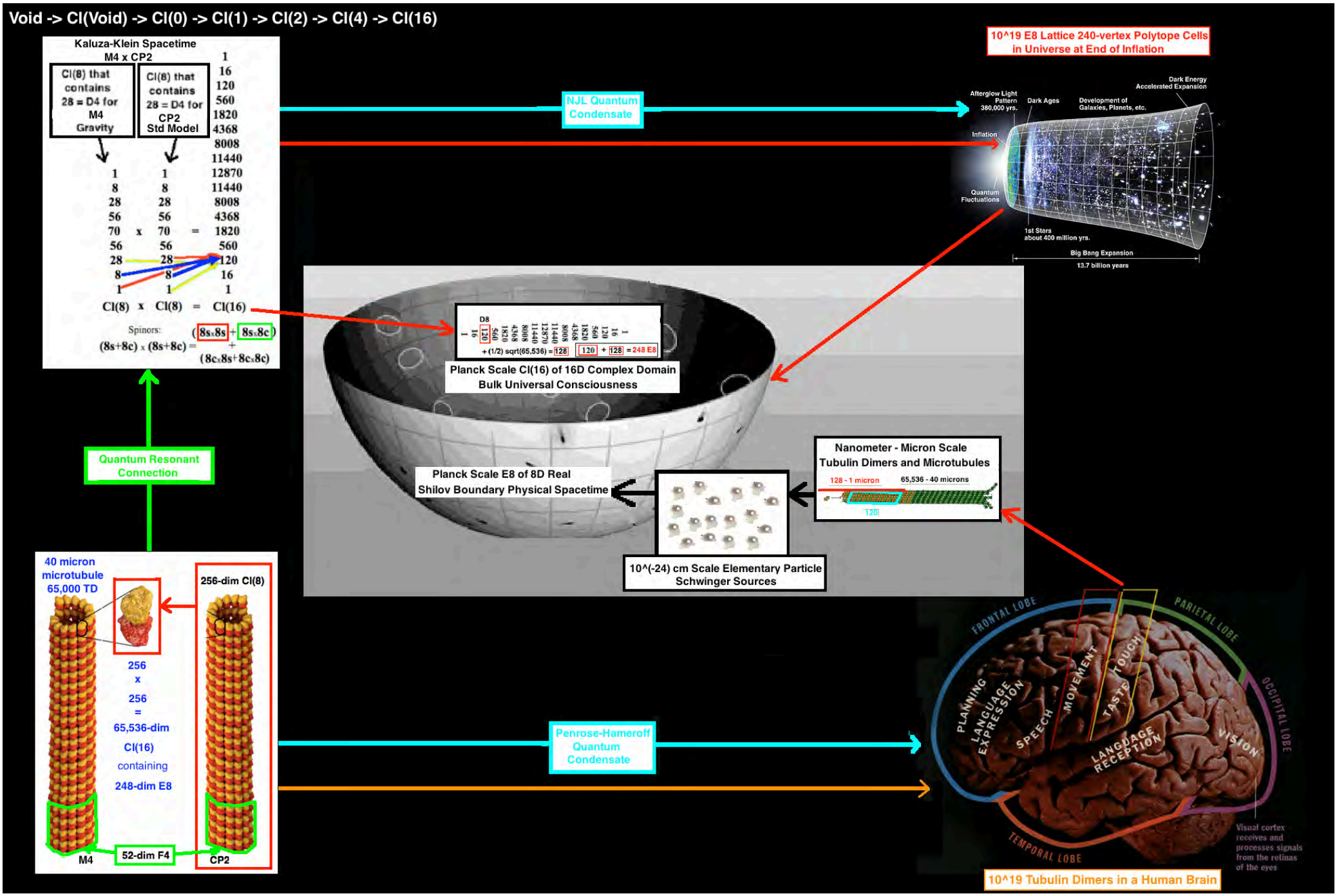
F4 / B4 = OP2 = Spinor Fermions =
= 8 Particles + 8 AntiParticles
B4 / D4 = 8-dim SpaceTime =
= Kaluza-Klein M4 x CP2
D4 = Spin(4,4) contains Spin(2,4) of
Conformal Gravity + Dark Energy

Cross section

E8 Kaluza-Klein (Cnf6 -> M4) x CP2

In (Cl(8) of CP2) x (Cl(8) of Cnf6 -> M4) = Cl(16)
containing E8
at each of the 256 points of Cl(8) of Cnf6 -> M4
there are all 256 points of Cl(8) of CP2

E8 / D8 = 128-dim Fermion Spinor Space = 8 components of 8+8 Fermions
D8 / D4 x D4 = A7+1 = 64 = 8-dim position x 8-dim momentum
D4 containing D3 = Spin(2,4) = A3 = SU(2,2) for Conformal Gravity + Dark Energy
D4 containing D3 = SU(4) containing Color Force SU(3)


Void -> Cl(Void) -> Cl(0) -> Cl(1) -> Cl(2) -> Cl(4) -> Cl(16)
Kaluza-Klein Spacetime
M4 x CP2
Cl(8) that contains 28 = D4 for M4 Gravity
Cl(8) that contains 28 = D4 for CP2 Std Model
1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1
1 8 28 56 70 56 28 8 1 x 1 8 28 56 70 56 28 8 1 = 1 16 120 560 1820 560 120 16 1
Cl(8) x Cl(8) = Cl(16)
Spinors:
(8s+8c) x (8s+8c) = (8sx8s + 8sx8c) + (8cx8s+8cx8c)
Quantum Resonant Connection
40 micron microtubule 65,000 TD
256-dim Cl(8)
256 x 256 = 65,536-dim Cl(16) containing 248-dim E8
M4
52-dim F4
CP2
Penrose-Hameroff Quantum Condensate
NJL Quantum Condensate
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation
Afterglow Light Pattern 380,000 yrs.
Dark Ages
Development of Galaxies, Planets, etc.
Dark Energy Accelerated Expansion
Inflation
Quantum Fluctuations
1st Stars about 400 million yrs.
Big Bang Expansion
13.7 billion years
D8
1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1
+(1/2) sqrt(65,536) = 128
120 + 128 = 248 E8
Planck Scale Cl(16) of 16D Complex Domain Bulk Universal Consciousness
Planck Scale E8 of 8D Real Shilov Boundary Physical Spacetime
10^(-24) cm Scale Elementary Particle Schwinger Sources
Nanometer - Micron Scale Tubulin Dimers and Microtubules
128 - 1 micron
65,536 - 40 microns
120
FRONTAL LOBE
PARIETAL LOBE
OCCIPITAL LOBE
TEMPORAL LOBE
PLANNING
LANGUAGE EXPRESSION
SPEECH
MOVEMENT
TASTE
TOUCH
LANGUAGE RECEPTION
VISION
Visual cortex receives and processes signals from the retinas of the eyes
10^19 Tubulin Dimers in a Human Brain

Void -> Cl(Void) -> Cl(0) -> Cl(1) -> Cl(2) -> Cl(4) -> Cl(16)

Kaluza-Klein Spacetime
M4 x CP2

Cl(8) that contains 28 = D4 for M4 Gravity	Cl(8) that contains 28 = D4 for CP2 Std Model	
		1
		16
		120
		560
		1820
		4368
		8008
		11440
1	1	12870
8	8	11440
28	28	8008
56	56	4368
70	70	1820
56	56	560
28	28	120
8	8	16
1	1	1

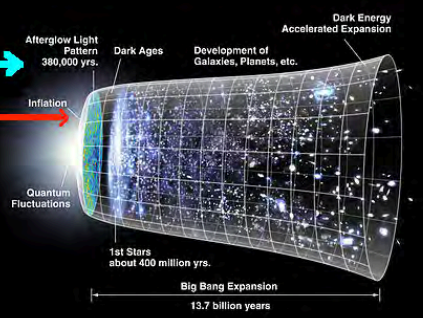
Cl(8) x Cl(8) = Cl(16)

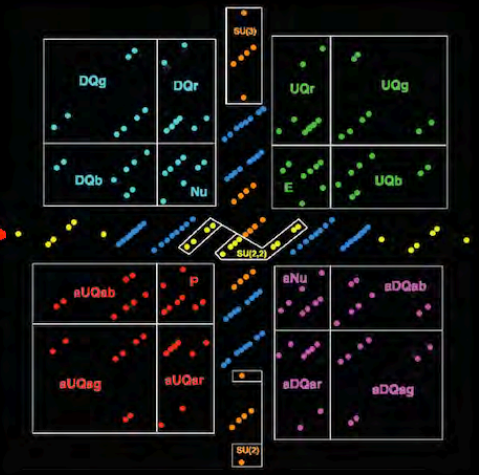
Spinors: (8s x 8s + 8s x 8c)
(8s+8c) x (8s+8c) = +
(8c x 8s + 8c x 8c)

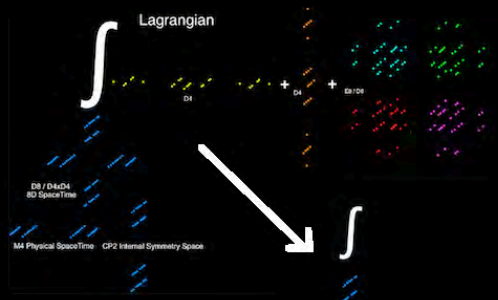
Quantum Resonant Connection

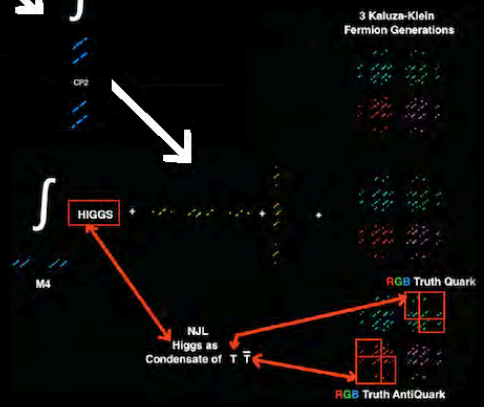
NJL Quantum Condensate

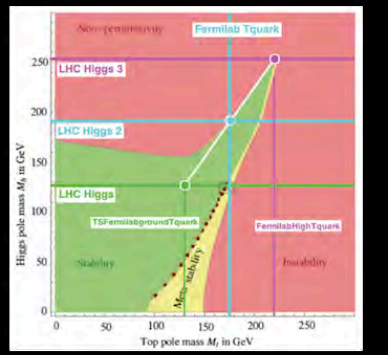
10^19 E8 Lattice 240-vertex Polytope Cells in Universe at End of Inflation







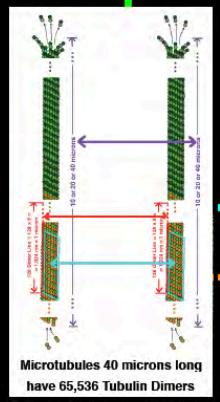




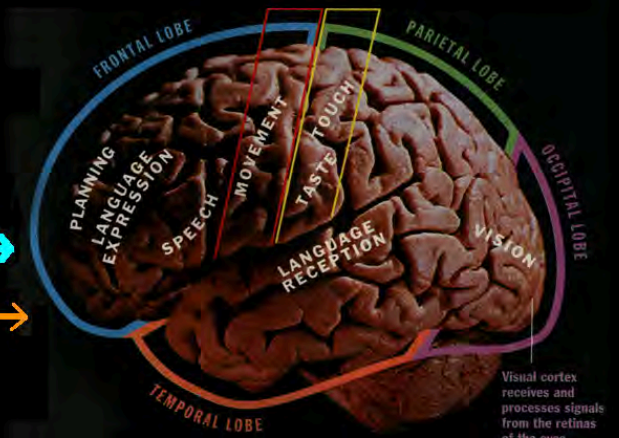
Cl(0,16) x Cl(0,8) = Cl(0,24)

M(2,Cl(0,24)) = Cl(1,25)

Completion of Union of
All Tensor Products of Cl(1,25) = **AQFT**



Penrose-Hameroff Quantum Condensate

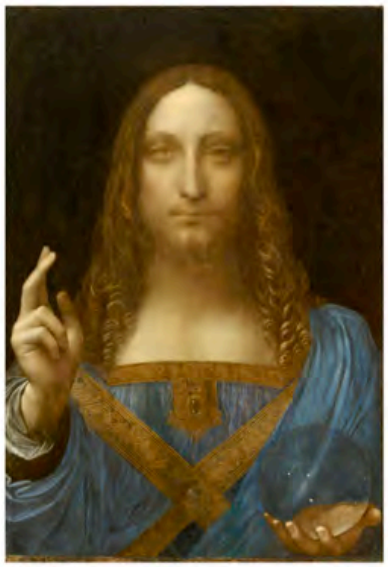


10^19 Tubulin Dimers in a Human Brain

Leonardo da Vinci E8

Frank Dodd (Tony) Smith, Jr. - 2017

Wikipedia: “... Christ as Salvator Mundi (Saviour of The World) ... is a painting ... from c. 1500 ... by Leonardo da Vinci ... The painting shows Christ, in Renaissance dress, giving a benediction with his raised right hand and crossed fingers while holding a crystal sphere in his left hand ...



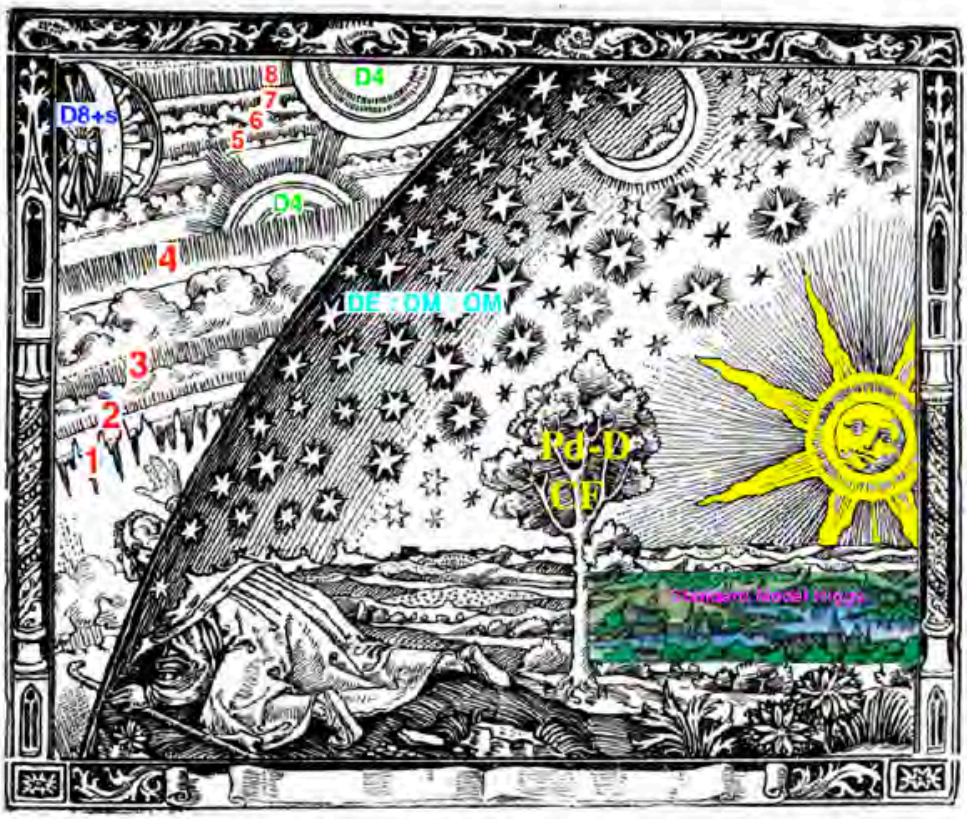
... It was ... possibly painted for Louis XII of France and his consort, Anne of Brittany ... shortly after the conquests of Milan and Genoa around 1500 [and] subsequently owned by Charles I of England and recorded in his art collection in 1649 ... Leonardo painted the orb as if it were a hollow glass bubble that does not refract or distort the light passing through it ...[instead of]... paint[ing] the distortion that would occur when looking through a solid clear orb ...”.

Since Leonardo’s orb is a hollow sphere instead of a solid ball Leonardo’s markings are all on the surface of the 2-dim sphere boundary of the ball in 3-dim space.

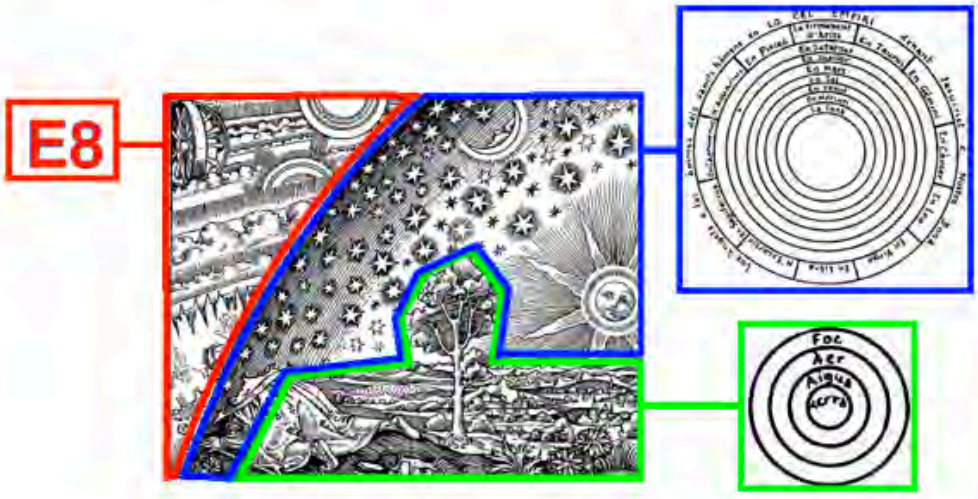
E8-Cl(16) Physics (viXra 1602.0319) is based on the 240 Root Vectors of E8 which are points on the 7-dim sphere boundary of the ball in 8-dim space.

248-dim E8 = 120-dim D8 + 128-dim D8 +half-spinor =
= D4xD4 + 8x8 + 128-dim D8 +half-spinor D8+s

The structure of E8 was depicted by Flammarion (wood engraving on page 163 of his 1888 book "L'Atmosphere Meteorologie Populaire") on a Celestial Sphere beyond our Earthly Plane and its Star-Sun-Moon-Planets Sphere (viXra 1304.0071):

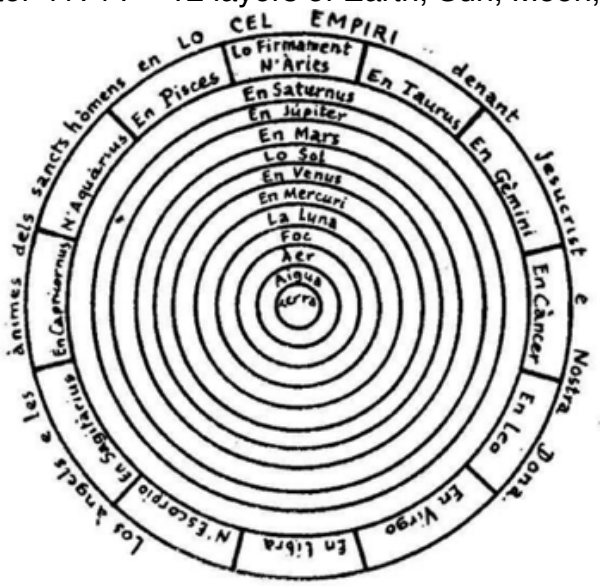


Flammarion's 1888 engraving was much later than Leonardo's 1500 painting
so it did not directly influence Leonardo, but its basic components were well known
from at least the time of Ramon Llull (1232-1315)



who, according to R. Pring-Mill, Studies on Ramon Llull , Barcelona, PAM-Curial, 1991,
p. 62, produced a "Scheme of the simplified aristotelian cosmos"
as a circle centered by 4 layers Earth, Water, Air, and Fire
and then by 7 layers Moon, Mercury, Venus, Sun, Mars, Jupiter, and Saturn
and an 8th layer for the fixed Stars described by the Zodiac

and the 13th layer of Angels, Saints, and the Heavenly Empire of Jesus and G-d
which I interpret as E8 Physics by which G-d governs Our Universe.
that is beyond the outer 4+7+1 = 12 layers of Earth, Sun, Moon, Planets, Stars:



The Flammarion Celestial Sphere representation of E8
corresponds to Leonardo's Sphere with markings also representing E8.

Flammarion's Celestial Sphere has two copies of D4 each with 24 Root Vectors
and 128 Root Vectors from +half-spinors D8+s of D8
and
8 levels of 8 Spacetime dimensions for position x momentum = 8x8 = 64 Root Vectors
thus giving 24 + 24 + 128 + 64 = 240 Root Vectors of E8.

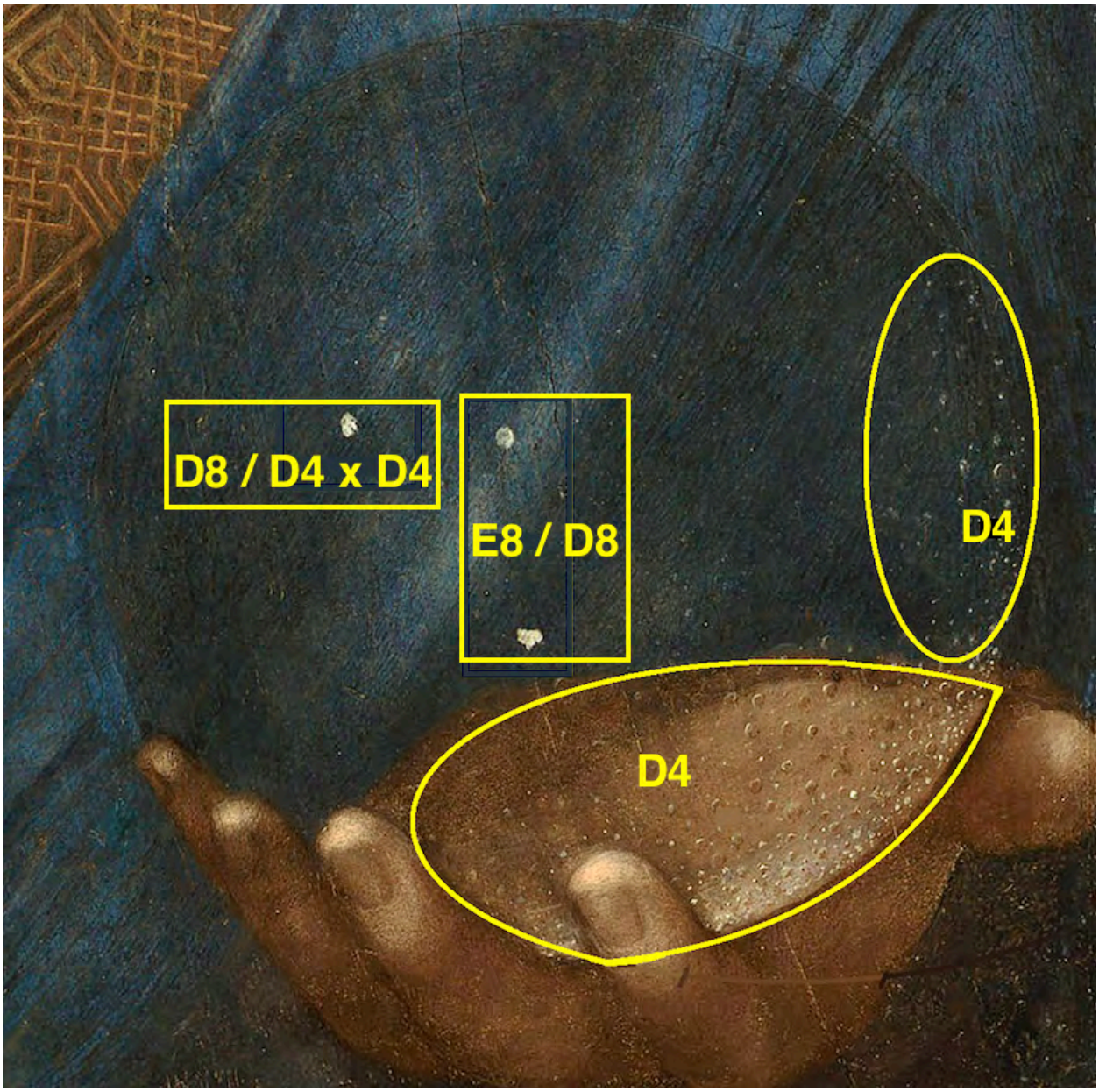
Flammarion's Earthly Plane and Stars-Sun-Moon-Panets Sphere corresponding to

Gravity , Dark Energy ratio DE:DM:OM , Higgs , Solar Fusion , and Pd-D Cold Fusion

is not shown explicitly by Leonardo, but is represented by Leonardo as

Earthly Plane = Brown Hand and Stars-Sun-Moon-Panets Sphere = Blue Garment.

Leonardo's Celestial Sphere represents E8 in this way:



Two markings correspond to 64+64 = 128-dim E8 / D8
(8x8 Fermion and 8x8 AntiFermion components)
The third marking corresponds to 64-dim D8 / D4 x D4
(8-dim Spacetime 8x8 Position x Momentum)
One of the D4 groups of markings corresponds to
the Standard Model and Gravity-Dark Energy Ghosts.
The other D4 group of markings corresponds to
Gravity-Dark Energy and Standard Model Ghosts.
24 of each D4 group of markings are D4 Root Vectors,
the others are composite structures such as
Gauge-Boson-bound (mesons, baryons, atoms) and Gravity-bound (black holes, planets, stars, galaxies).

E8-Cl(16) Physics Calculations of Particle Masses and Force Strengths
from Green's Functions = Kernel Functions of Schwinger Sources
make use of Shilov Boundaries of Complex Domains whose structure
is inherited from the geometry of E8.