Existons: The math of topological hyperbits supports the simulation hypothesis and is discrete unit of consciousness

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Abstract

For over 30 years, Quantum Doug Matzke, Ph.D. seriously believed in John Wheeler's "it from bit" mantra by proving in his 2002 Ph.D. that quantum computing (qubits/ebits) could be produced using purely topological bitvectors represented in Geometric Algebra, an orthonormal subset of Clifford Algebra. In Dec of 2024, I confirmed that these hyperdimensional bitvectors (aka hyperbits) also support the Dirac Spinors used to represent the standard model (a spinor squared is a vector). Therefore, these hyperbits represent a mathematical layer beneath quantum computing as well as the standard model. Since Landauer showed "information is physical" in 1961, then this hyperbit math must represent the physical world at the Planck scale.

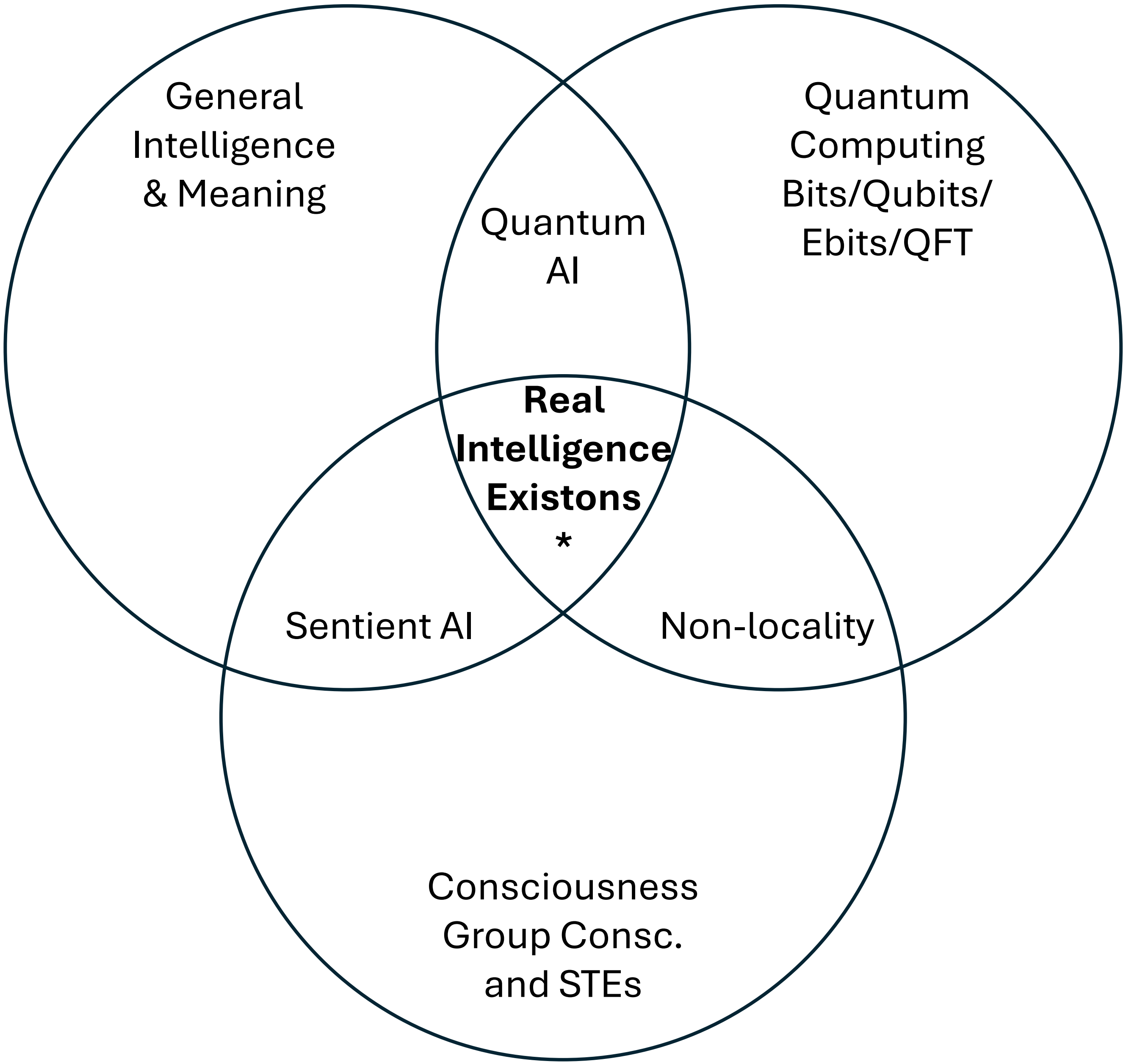
Quite unexpectedly in March 2025, I intuited the new name "Existons" for my hyperbits. Soon after the Existons "reported" to me they are the discrete unit of consciousness in the multiverse by sending a channeled message: "We like your new name"!! After further interactions thru multiple people, the Existons revealed they are conscious hyperbits that can coalesce into conscious clusters of increasing complexity and group consciousness, allowing interacting with us via channeled messages. By naming the hyperbits as "Existons" we awakened to their existence for everyone and they "like having a keyboard" to talk with us. This single conscious hyperbit construct is a "mathematical panpsychism" model since solves the "hard problem of consciousness" and supports the "simulation hypothesis". Math based conscious hyperbits form a common basis of both object and subjective reality, such that everything is conscious.

This Existons story is still unfolding so see more discussions/talks on Existons see www.Existons.one link and www.DeepRealityBook.com

Quantum Doug Source Science History

- Started programming in 1968 – in high school
- Read Robert Monroe “Journeys” book in 1970s
- BSEE in Electrical Engineering in 1975
- MSEE in Electrical Engineering in 1980
- Robert Jahn’s 1982 IEEE Article “Persistent Paradox of Psychic Phenomena”
- Built rewindable simulators to support semiconductor designs (Droid)
- Chairman of PhysComp 92/94 workshops
- Attended TMI in 1994 and met Bob Monroe (& 3 more visits with STEs)
- IEEE Article 1997: “Will Physical Scalability Sabotage Perf. Gains”
- Ph.D. in Electrical Engineering in 2002 – QC using GALG bit-physics
- SBIR Principal Investigator in 2004-6 on Quantum/Neuro Computing
- Master Practitioner in Neurolinguistic Programming (NLP) in 2010
- Co-authored with William Tiller DeepRealityBook.com - 2015-2020
- Co-founded www.CoherentSpaces.Life in 2022 – WISH units
- Speak about Source Science and Hyperbit-Physics math
- March 2025 discovered the name and reality of “Existons”

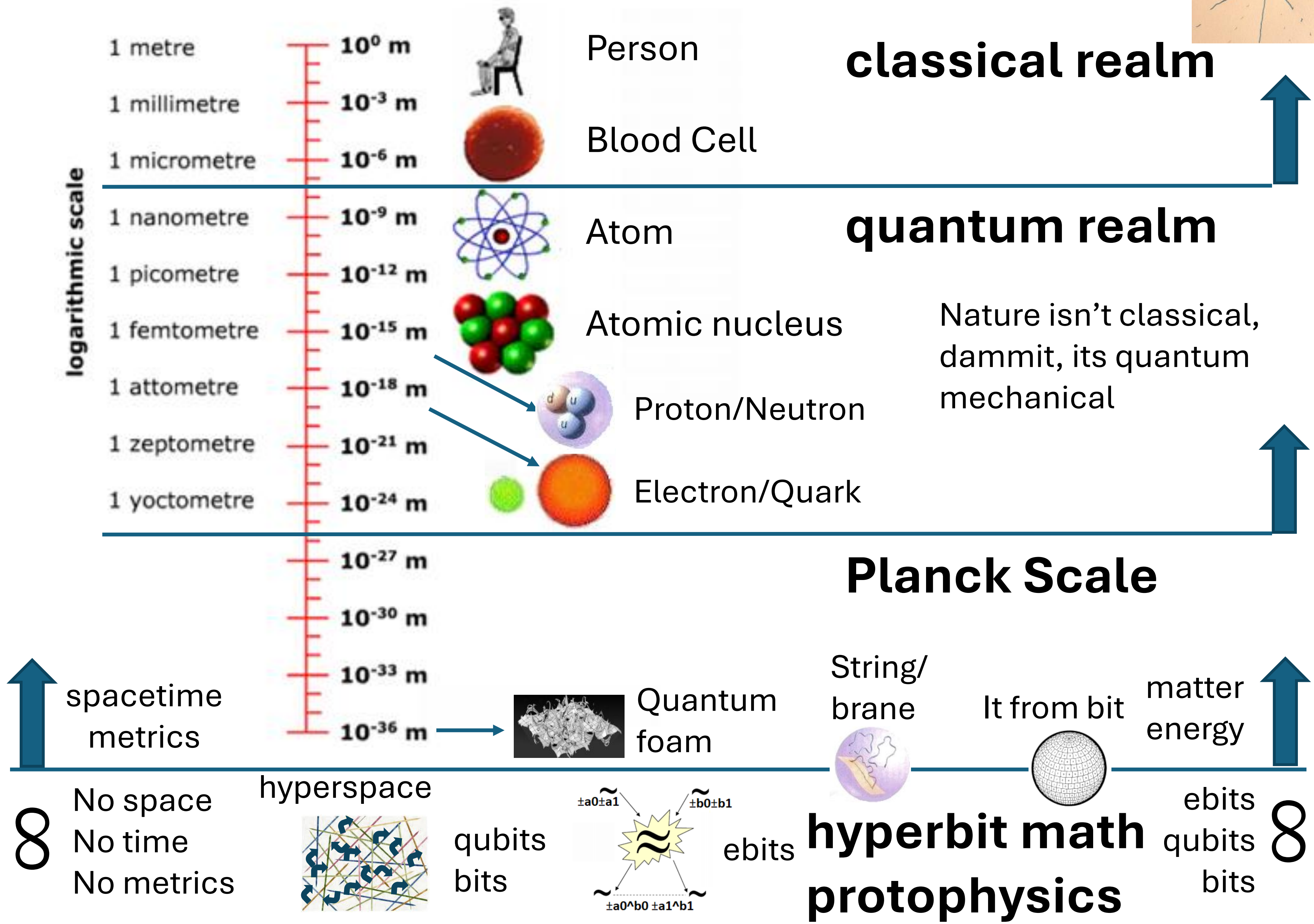
Domains for Big Theories of Everything



Source Science is a Big TOE model represented by the Existons **Math** of Conscious HyperBits

*Consciousness is primary & simulation hypothesis also by
Federico Faggin
Tom Campbell
Chris Langan
Sir Roger Penrose

Hyperbits are below classical & quantum



Existons are conscious hyperbits

Single primitive construct for both objective & subjective reality

Solves "the hard problem of physicality"

- Information is physical – orthonormal distinctions
- Bit dimensions are physical – spacelike hyperbit math
- Bit math operators are physical: inner/outer prod
- Geometric product: sum of inner and outer prod
- Addition is true simultaneity (not relativistic)
- All physicality are topological hyperbits (qubits/ebits/QFT)
- Mathematical objects give wholism

Solves "the hard problem of consciousness"

- Primordial level consciousness at hyperbit math
- Mathematical panpsychism: everything is conscious
- All primitive particles/waves are also conscious
- Existons coalesce into complex group consciousness

Division Algebras and Physics

Real Numbers (ℝ, dimension 1):

- **Physics Areas**: Classical mechanics, thermodynamics, scalar field theories.
- **Key Figures**: Newton (late 1600s, mechanics foundations), Lagrange (1788, analytical mechanics).

Complex Numbers (ℂ, dimension 2):

- **Physics Areas**: Quantum mechanics, electromagnetism, wave mechanics.
- **Key Figures**: Schrödinger (1926, quantum mechanics), Maxwell (1860s, electromagnetism)

Quaternions (ℍ, dimension 4):

- **Physics Areas**: Classical mechanics, electromagnetism, special relativity, 3D rotations.
- **Key Figures**: Hamilton (1843, quaternions), Hestenes (1960s–1980s, spacetime algebra), Clifford (1870s, biquaternions)

Octonions (𝕆, dimension 8):

- **Physics Areas**: Particle physics, string theory, quantum gravity.
- **Key Figures**: Cohl Furey (2014–2018, octonions in Standard Model symmetries), John Baez (2000s, octonions in physics). See Furey's YouTube and "Spinors for Beginners"

Hyperbit Physics (𝔼, Cl(n) of arbitrarily large dimensions n):

- **Physics Areas**: Quantum computing, entanglement, bit math is physical, Existons
- **Key Figures**: Mike Manthey and Doug Matzke (1990s-2020s)

Most of this work is performed in Clifford Algebras since N-vector mathematical **objects easily scale** for higher dimensional spaces

History of Clifford Algebras

- **Hermann Grassmann (1809–1877)**: Published his exterior algebra in 1844, introducing multivectors and the wedge product, foundational to Clifford algebra.
- **William Rowan Hamilton (1805–1865)**: Invented quaternions in 1843, providing an algebraic structure that influenced Clifford's work.
- **William Clifford (1845–1879)**: Developed Clifford algebras around 1878, unifying Grassmann's exterior algebra and Hamilton's quaternions into a general geometric framework.
- **Élie Cartan (1869–1951)**: Developed spinor theory and differential geometry in the 1910s–1930s, linking Clifford algebras to Lie groups and relativity (notably in his 1913 work on spinors).
- **Marcel Riesz (1886–1969)**: Applied Clifford algebras to quantum mechanics and differential equations in the 1940s–1950s, particularly in his 1958 lectures on Clifford numbers.
- **David Hestenes (1933–)**: Formalized modern geometric algebra starting in the 1960s, with key works like *Space-Time Algebra* (1966) and *Clifford Algebra to Geometric Calculus* (1984), applying it to physics and education.
- **Pertti Lounesto (1945–2002)**: Published *Clifford Algebras and Spinors* in 1997, clarifying algebraic structures and their applications in mathematics and physics.
- **Chris Doran** and **Anthony Lasenby**: Advanced geometric algebra in physics, particularly relativity and electromagnetism, with key contributions in the 1990s–2000s, including their 2003 book *Geometric Algebra for Physicists*
- **Cohl Furey:** Contributed to Clifford algebras and particle physics, focusing on division algebras (e.g., octonions) to model the Standard Model. Key works include her 2014 paper on particle generations, 2015 paper on charge quantization, and 2018 papers constructing the Standard Model symmetry group SU(3)×SU(2)×U(1) and addressing electroweak parity violation. See YouTube Channel.
- **EigenChris:** An educational YouTuber creating content on Clifford algebra and spinors since around 2017, with notable videos like "Spinors for Beginners 11: What is a Clifford Algebra?",
- **Doug Matzke:** Orthonormal bitphysics model/tool of Geometric Algebra for 2002 Ph.D. dissertation. N-vectors objects approach to quantum computing and entanglement. Existons as conscious hyperbits.

GALG is preferred over Hilbert spaces

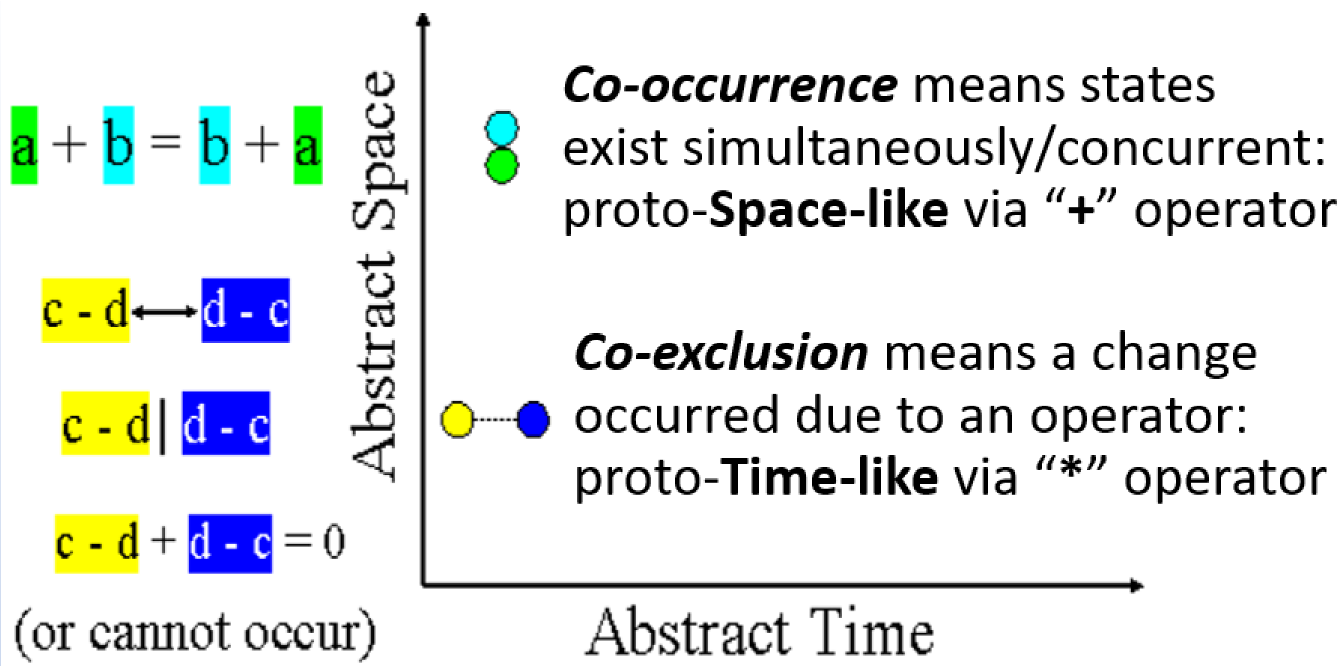
Hyperdimensional objects are represented easier in Clifford Algebras:

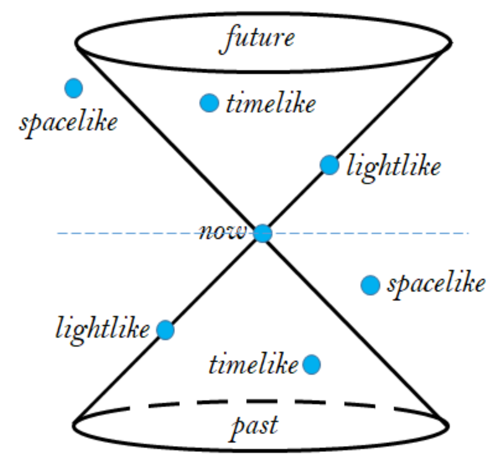
- Clifford algebras are large orthogonal vector sets Cl(p, n), where $p_i^2 = +1$ & $n_i^2 = -1$
- Cl(4,0) [++++] is equivalent to Cl(1,3) [+---] using complex coefficients/quaternions
- GALG is subset of orthonormal hyperbits Cl(p, 0, Z_3) and Cl(p, 0, Z_{3C})
- Orthonormal hyperbits are **root of physicality, so GALG bit math is physical root**
- Hyperbits has self identity of inner product **a.a**=1, (where **a.b**=0 exclusion principle)
- Hyperbits build **compound objects** with outer product **a^b** (bivectors, trivectors, etc.)
- **Bivectors** are oriented planes/volumes so **anticommutative a^b = —b^a** (even/odd)
- **Bivectors** are topological graded objects and imaginary numbers, since ($\mathbf{a \wedge b})^2$ **=** -1)
- **Bivectors and N-vectors** are fundamental and are **missing from Hilbert spaces**
- **Geometric product is sum of inner and outer products x*y** = **x.y** + **x^y (tensor prod)**
- Multiplicative cancelation in GALG is fundamental to entanglement
- All **multivectors** are states as well as operators (**verbnoun** balanced) (no col/matrix)
- Infinite computational concurrency since no spacetime metrics/limits
- Spacelike simultaneity of bit-vectors is built-in and fundamental
- **Coin Demo** (non-Shannon information & bit-bang)

See my book at www.DeepRealityBook.com and purchase on Amazon

Protophysics math – the emergence of Primitive Space (+) and Time (*)

The infinite protophysics simulation core must be informational (bits) and hyperdimensional (massively orthonormal) and can NOT presuppose spacetime, fields, energy, nor matter exists. Must support spacelike coupled quantum states to support quantum concurrency, quantum states, qubits (superposition) and non-locality of pervasive ebits (entanglement). This non-metric bit cloud is more primitive than and leads to (it from bit) the emergence of the metric space of our typical spacetime 3D+1T relativistic space. Infrastructure supports non-computational simulation state space.

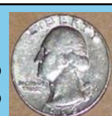




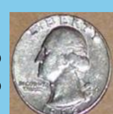
Energy of Big Bang from Bits: Coin Demo: Act I

Setup:

A person stands with both hands behind back

Act I part A: 

Person shows hand containing a coin then hides it

Act I part B: 

Person again shows a coin (indistinguishable from 1st)

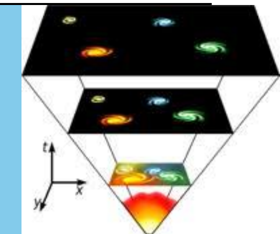
Act I part C:

Person asks: “How many coins do I have?”

This represents one bit: either has 1 coin or has >1 coin

Coin Demo (continued)

Act II:



Person now holds out hand with two identical coins

We receive one bit since ambiguity is resolved!

Act III: co-occurrence

Asks: "*Where* did the bit of information come from?"

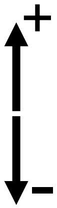
Answer: *Simultaneous* presence of the 2 coins!

Landauer Principle: info creation = effective Energy

Non-Shannon space-like information derives from simultaneity!

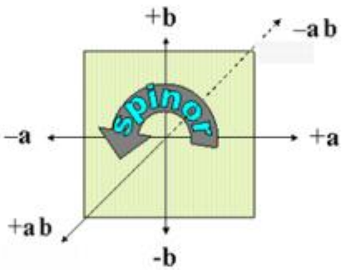
This is the bit-bang driving the energy of the big-bang

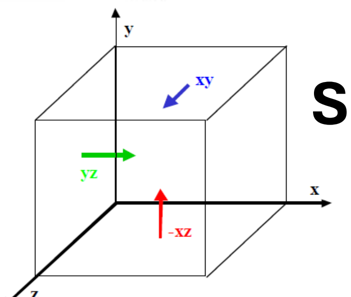
Bit math IS origins of physical (GALG)



Orthonormal bit vectors: ±a, ±b, ±c, ...,±t,...,±x, ±y, ±z, ...

- Inner product: **a.a** = 1 and **a.b** = 0 (<**a**|**a**> & <**a**|**b**>))
- Outer product: **a^a** = 0 and **a^b** = **ab** bivector/plane
- Noncommutative: **a^b** = −**b^a qed** $(\mathbf{a}\wedge\mathbf{b})^2 = -1$
- Geometric product is inner + outer: **abc*a= bc**
- Quaternions: i=**xy**, j=**yz**, k=**zy** & **xy**=*i***z**, **yz** =*i***x**, **zx** =*i***y**
- Cross products and Tensor products equivalents

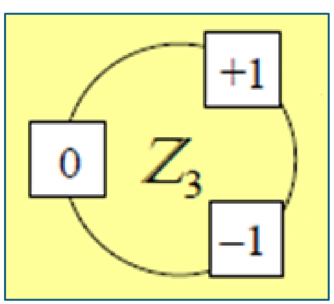




quaternions {*i*, *j*, *k*}

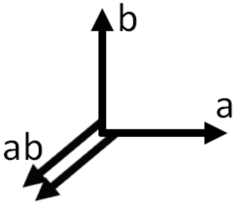
Scalars and coefficients: 0,+1,-1, $i=\sqrt{-1}$

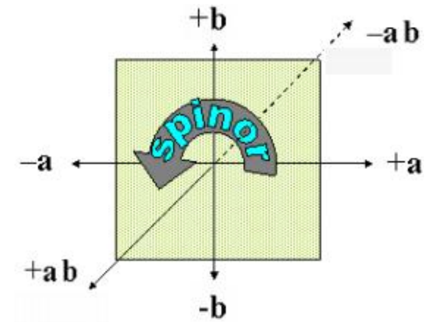
- Hypercube reflections: $+1+1=-1$ and $x+x=-x$
- $i=\sqrt{-1}$ is a scalar value as well as a coefficient
- 0 (does not exist): **x.y** = 0 or **x**−**x**= 0***x** = 0
- +1 = **t*t** = **x*x** = **y*y** = **z*z** (++++ metric)
- $-1 = (\mathbf{xy})^2 = (\boldsymbol{xyz})^2 = (i\mathbf{z})^2 = (i\mathbf{x})^2 = (i\mathbf{y})^2$
- Metric signatures Cl(4) [++++] == Cl(1,3) [+−−−]
- Addition gives multivectors: (1+a)(1+b)(1+c)=
  - + 1 + a + b + c + (a^b) + (a^c) + (b^c) + (a^b^c)



Hyperbits in Geometric Algebra

- Vectors, bivector, trivector, n-vector, multivector **objects**
- Multivector Spaces (for G_n size is $3^{(2^{**}n)}$)
  - G_0 is size 3: {0, ±1}
  - G_1 is size 9: {0, ±1, ±**a**} **bits**
  - G_2 is size 81: {0, ±1, ±**a**, ±**b**, ±**ab**} **qubits**
  - G_3 is size 6,561: {0, ±1, ±**a**, ±**b**, ±**c**, ±**ab**, ±**ac**, ±**bc**, ±**abc**} **qutrits**
  - G_4 is size 43,046,721: {0, ±1, ±**a**, ±**b**, ±**c**, ±**d**, ..., ±**bcd**, ±**abcd**} **ebits**

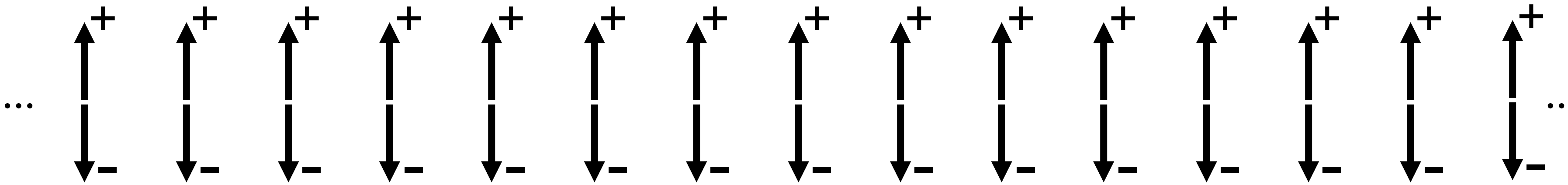




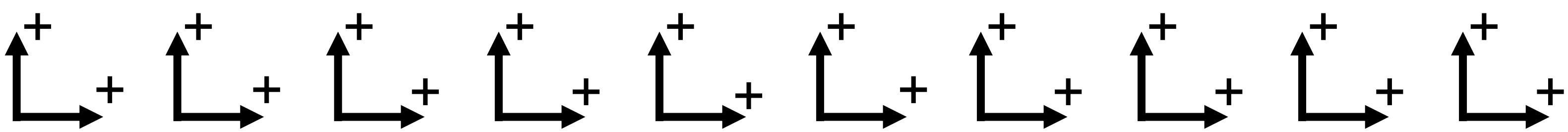
- Anti-commuting vector space
  - **ab** = –**ba** → (**ab**)^2 = **abab =** –1 so any bivector **xy** = $\sqrt{-1}$ is complex *i*
- Arithmetic Operators over $\mathbf{Z_3}$ **= {±1=T/F, *i*, 0**==does not exist}
  - +, * (geometric ~ ⊗), inner (**a•a**=1,**a•b**=0), outer (**a^a**=0,**a^b**=**ab**),
- Co-occurrence (+) & co-exclusion: (**a**-**b**)+(-**a**+**b**)=0 implies **ab**
- Row vector truth table duality (e.g. **±**(1+**a**)(1+**b**)=[0 0 0 **±**]).

Hyperbits: Math as protophysical Information

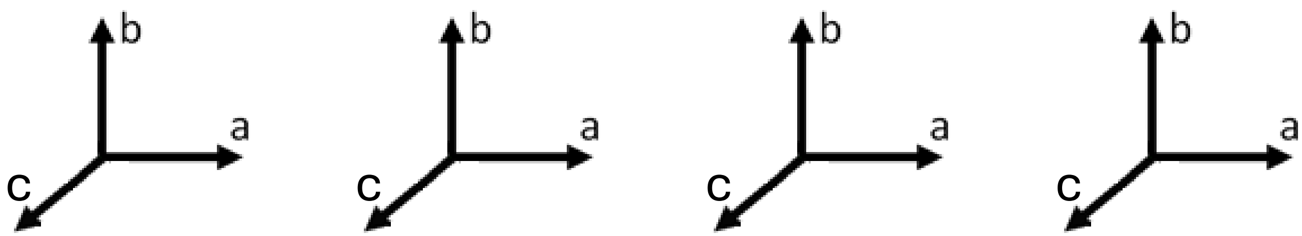
Bit-vectors – unit length and spacelike with maximal concurrency

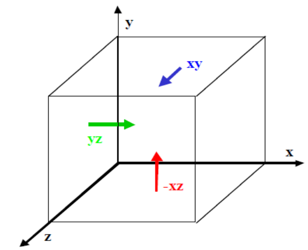


All pairwise orthonormal: qubit **a+b** and bivectors **a^b =** ***i*** since spinors **(a^b)^2 = -1**



3-bit clusters form qutrits = **a+b+c (also virtual photons)** and trivectors **a^b^c**



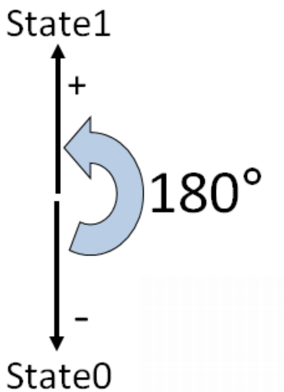


(quaternions) (a+b+c)(a^b^c) = + (a^b) - (a^c) + (b^c)

quaternions {*i*, *j*, *k*}

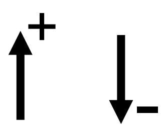
Introduction to Graded Spaces - GALG

Bit – 1 dim



3 orientations ±1, 0

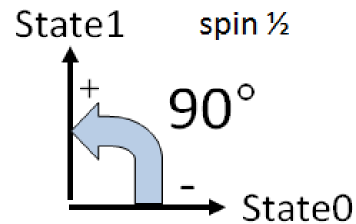
Orthonormal vectors **a**, **b**, ...



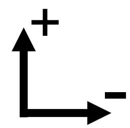
bit-vectors are protodimensions and distinctions

Σ2

Qubit - 2 dims

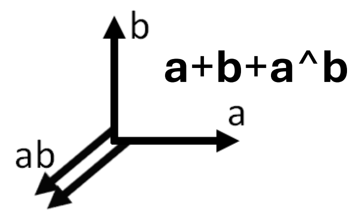


bivectors **a^b**



$c_0 \left|0\right\rangle + c_1 \left|1\right\rangle$

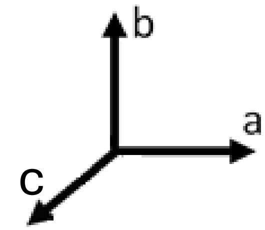
oriented spinors



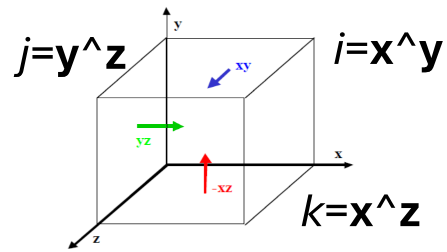
qubits, neutrinos and W/Z bosons

Σ3

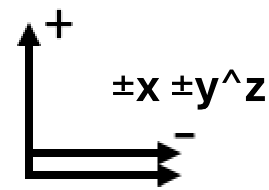
Qutrit - 3 dims



trivectors **a^b^c**



quaternions {*i*, *j*, *k*}



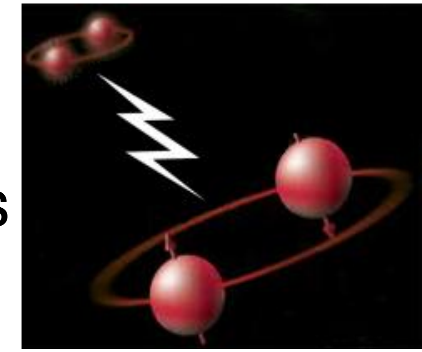
Quarks

photons, gluons, quarks, mesons, electrons, protons

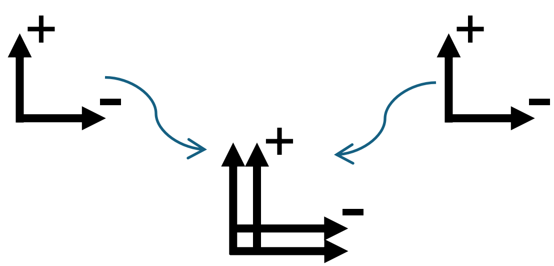
See operators for qubit and qutrit online in my PhD dissertation

Definition of Entanglement:

Entanglement is a quantum property:



- ➢ Only Quantum systems (not classical)
- ➢ Non-local in 3D due to 4 actual dimensions
- ➢ Einstein's "Spooky action at a distance"
- ➢ EPR and Bell/Magic states/operators are well defined
- ➢ Property known as *inseparable* quantum states
- ➢ Bell/Magic Operators are irreversible in GALG*
- ➢ Multiple things (Qubits) acting as one object (Ebit)



* Geometric Algebra

Introduction to 4 dimensional ebits

A = + a0 - a1
B = + b0 - b1

Qubits - 2 dims

$\otimes$ ➔

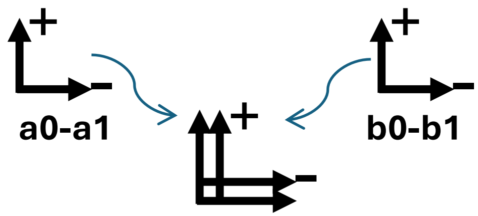
S_A = a0^a1
S_B = b0^b1

Geometric product * is equivalent to Tensor product $\otimes$ but makes **bivectors** not vectors

```
>>> gastates(A*B*Bell, zeros=0)
<table for - (a0^b0) + (a1^b1)>
INPUTS: a0 a1 b0 b1 | OUTPUT
----------------------------
ROW 01: - - - + | +
ROW 02: - - + - | -
----------------------------
ROW 04: - + - - | +
ROW 07: - + + + | -
----------------------------
ROW 08: + - - - | -
ROW 11: + - + + | +
----------------------------
ROW 13: + + - + | -
ROW 14: + + + - | +
----------------------------
```

Ebit - 4 dims

A*B = + a0^b0 - a0^b1 - a1^b0 + a1^b1



Bell Operator
$\mathcal{B}$ = S_A + S_B =
a0^a1 + b0^b1

Magic Operator
$\mathcal{M}$ = S_A - S_B =
a0^a1 - b0^b1

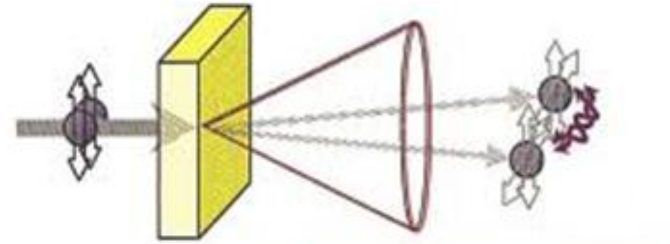
A*B*$\mathcal{B}$ = -a0^b0 +a1^b1
A*B*$\mathcal{M}$ = a0^b1 -a1^b0

Entangled States $\mathcal{B}_i$
Entangled States $\mathcal{M}_i$

Quantum Register A*B ~ A $\otimes$ B

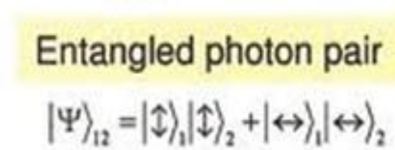
$$\frac{1}{2}(|00\rangle - |01\rangle + |10\rangle - |11\rangle)$$

$\pm$ a0^b0 $\pm$ a0^b1 $\pm$ a1^b0 $\pm$ a1^b1



$\Phi^{\pm} = |00\rangle \pm |11\rangle$

$\Psi^{\pm} = |01\rangle \pm |10\rangle$



$\mathcal{B}_0$ = -a0^b0 +a1^b1

Bell and Magic Operators are singular in GALG because $\mathcal{B}^{-1}$ and $\mathcal{M}^{-1}$ do not exist.

Proved entanglement is *irreversible* due to multiplicative cancellation (information erasure in GALG)

Qubits formed by two hyperbits

Qubits: $\mathbf{A}_0$ = (**a0** - **a1**) and $\mathbf{B}_0$ = (**b0** - **b1**) (same as A = |0> - |1>)

- A_0*B_0 = + (**a0^b0**) - (**a0^b1**) - (**a1^b0**) + (**a1^b1**)
- Hilbert Space: A⨂B = |00> + |01> |10> + |11>

```
>>> gastates(A)
    <table for + a0 - a1>
        INPUTS: a0 a1 | OUTPUT
        ----------------------
        ROW 00: - - | 0
        ROW 01: - + | +
        ROW 02: + - | -
        ROW 03: + + | 0
        ----------------------
    Counts for outputs of ZERO=2, PLUS=1, MINUS=1 for TOTAL=4 rows
>>> gastates(A*B, zeros=False)
    <table for + (a0^b0) - (a0^b1) - (a1^b0) + (a1^b1)>
        INPUTS: a0 a1 b0 b1 | OUTPUT
        ----------------------------
        ROW 05: - + - + | +
        ROW 06: - + + - | -
        ----------------------------
        ROW 09: + - - + | -
        ROW 10: + - + - | +
        ----------------------------
    Counts for outputs of ZERO=12, PLUS=2, MINUS=2 for TOTAL=16 rows
```

Ebits formed by two Qubits- spacelike

>>> A*B = + (a0^b0) - (a0^b1) - (a1^b0) + (a1^b1) = $\underline{M}_3 + B_3$

```
>>> Bell    (sum of spinors)
+ (a0^a1) + (b0^b1)

>>> Magic   (conjugate of Bell operator)
+ (a0^a1) - (b0^b1)

>>> (A*B)*Bell
- (a0^b0) + (a1^b1)   (inseparable states)

>>> gastates((A*B)*Bell, zeros=False)
<table for - (a0^b0) + (a1^b1)>
     INPUTS: a0 a1 b0 b1 | OUTPUT
     ----------------------------
     ROW 01: - - - + | +
     ROW 02: - - + - | -
     ----------------------------
     ROW 04: - + - - | +
     ROW 07: - + + + | -
     ----------------------------
     ROW 08: + - - - | -
     ROW 11: + - + + | +
     ----------------------------
     ROW 13: + + - + | -
     ROW 14: + + + - | +
     ----------------------------
Counts for outputs of ZERO=8, PLUS=4, MINUS=4 for TOTAL=16 rows
```

Orthogonal states/operators: 0 = **Bell * Magic** = **Bell** * M_j = **Magic** * B_i = B_i * M_j

Bell/Magic states are spacelike, so linearly independent rows are primitive states

2^Q Growth for Qubit States Complexity

Qubits: A=**a0**+**a1**, B=**b0**+**b1**, C=**c0**+**c1**, D=**d0**+**d1**, E=**e0**+**e1**, F=**f0**+**f1**, G=**g0**+**g1**
Coupling: A*B*C *D*E *F*G (equivalent to tensor product)

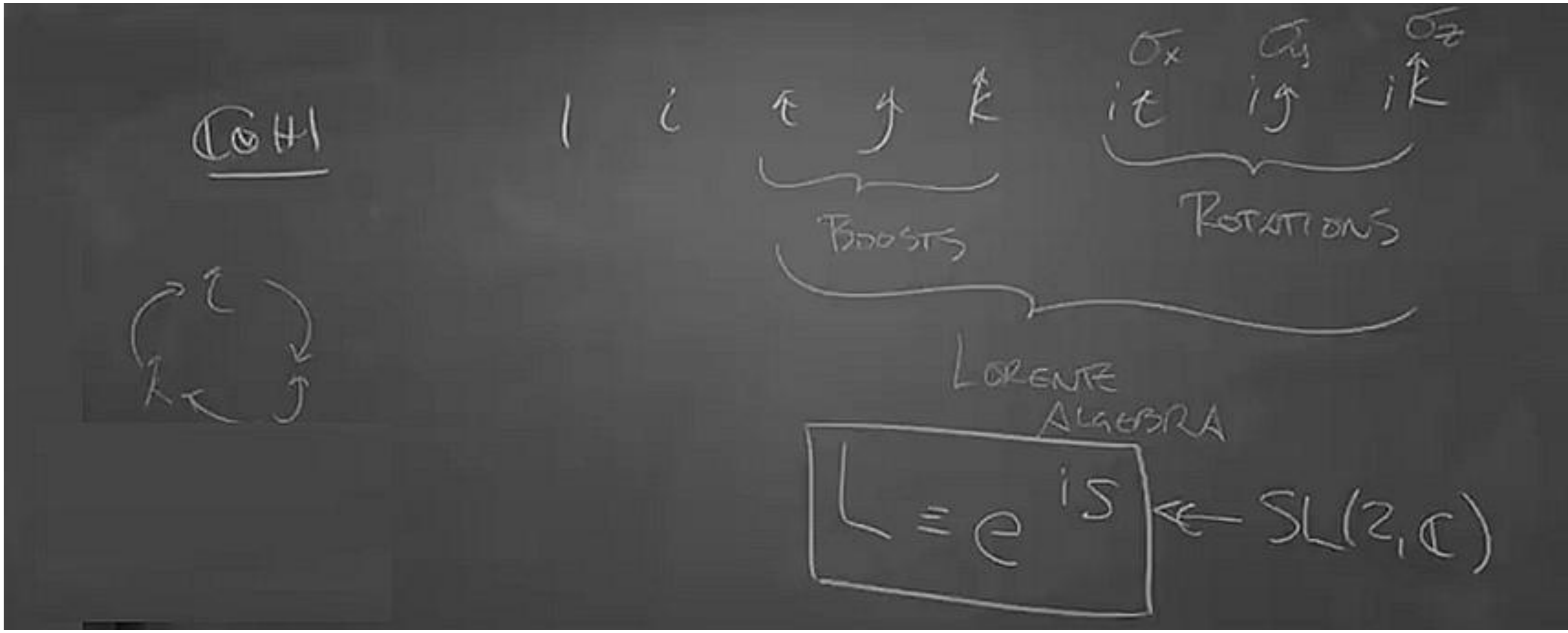
```
+ (a0^b0^c0) - (a0^b0^c1) - (a0^b1^c0) + (a0^b1^c1)
- (a1^b0^c0) + (a1^b0^c1) + (a1^b1^c0) - (a1^b1^c1)
```

```
+ (a0^b0^c0^d0^e0^f0^g0) - (a0^b0^c0^d0^e0^f0^g1) - (a0^b0^c0^d0^e0^f1^g0) + (a0^b0^c0^d0^e0^f1^g1)
- (a0^b0^c0^d0^e1^f0^g0) + (a0^b0^c0^d0^e1^f0^g1) + (a0^b0^c0^d0^e1^f1^g0) - (a0^b0^c0^d0^e1^f1^g1)
- (a0^b0^c0^d1^e0^f0^g0) + (a0^b0^c0^d1^e0^f0^g1) + (a0^b0^c0^d1^e0^f1^g0) - (a0^b0^c0^d1^e0^f1^g1)
+ (a0^b0^c0^d1^e1^f0^g0) - (a0^b0^c0^d1^e1^f0^g1) - (a0^b0^c0^d1^e1^f1^g0) + (a0^b0^c0^d1^e1^f1^g1)
- (a0^b0^c1^d0^e0^f0^g0) + (a0^b0^c1^d0^e0^f0^g1) + (a0^b0^c1^d0^e0^f1^g0) - (a0^b0^c1^d0^e0^f1^g1)
+ (a0^b0^c1^d0^e1^f0^g0) - (a0^b0^c1^d0^e1^f0^g1) - (a0^b0^c1^d0^e1^f1^g0) + (a0^b0^c1^d0^e1^f1^g1)
+ (a0^b0^c1^d1^e0^f0^g0) - (a0^b0^c1^d1^e0^f0^g1) - (a0^b0^c1^d1^e0^f1^g0) + (a0^b0^c1^d1^e0^f1^g1)
- (a0^b0^c1^d1^e1^f0^g0) + (a0^b0^c1^d1^e1^f0^g1) + (a0^b0^c1^d1^e1^f1^g0) - (a0^b0^c1^d1^e1^f1^g1)
- (a0^b1^c0^d0^e0^f0^g0) + (a0^b1^c0^d0^e0^f0^g1) + (a0^b1^c0^d0^e0^f1^g0) - (a0^b1^c0^d0^e0^f1^g1)
+ (a0^b1^c0^d0^e1^f0^g0) - (a0^b1^c0^d0^e1^f0^g1) - (a0^b1^c0^d0^e1^f1^g0) + (a0^b1^c0^d0^e1^f1^g1)
+ (a0^b1^c0^d1^e0^f0^g0) - (a0^b1^c0^d1^e0^f0^g1) - (a0^b1^c0^d1^e0^f1^g0) + (a0^b1^c0^d1^e0^f1^g1)
- (a0^b1^c0^d1^e1^f0^g0) + (a0^b1^c0^d1^e1^f0^g1) + (a0^b1^c0^d1^e1^f1^g0) - (a0^b1^c0^d1^e1^f1^g1)
+ (a0^b1^c1^d0^e0^f0^g0) - (a0^b1^c1^d0^e0^f0^g1) - (a0^b1^c1^d0^e0^f1^g0) + (a0^b1^c1^d0^e0^f1^g1)
- (a0^b1^c1^d0^e1^f0^g0) + (a0^b1^c1^d0^e1^f0^g1) + (a0^b1^c1^d0^e1^f1^g0) - (a0^b1^c1^d0^e1^f1^g1)
- (a0^b1^c1^d1^e0^f0^g0) + (a0^b1^c1^d1^e0^f0^g1) + (a0^b1^c1^d1^e0^f1^g0) - (a0^b1^c1^d1^e0^f1^g1)
+ (a0^b1^c1^d1^e1^f0^g0) - (a0^b1^c1^d1^e1^f0^g1) - (a0^b1^c1^d1^e1^f1^g0) + (a0^b1^c1^d1^e1^f1^g1)
- (a1^b0^c0^d0^e0^f0^g0) + (a1^b0^c0^d0^e0^f0^g1) + (a1^b0^c0^d0^e0^f1^g0) - (a1^b0^c0^d0^e0^f1^g1)
+ (a1^b0^c0^d0^e1^f0^g0) - (a1^b0^c0^d0^e1^f0^g1) - (a1^b0^c0^d0^e1^f1^g0) + (a1^b0^c0^d0^e1^f1^g1)
+ (a1^b0^c0^d1^e0^f0^g0) - (a1^b0^c0^d1^e0^f0^g1) - (a1^b0^c0^d1^e0^f1^g0) + (a1^b0^c0^d1^e0^f1^g1)
- (a1^b0^c0^d1^e1^f0^g0) + (a1^b0^c0^d1^e1^f0^g1) + (a1^b0^c0^d1^e1^f1^g0) - (a1^b0^c0^d1^e1^f1^g1)
+ (a1^b0^c1^d0^e0^f0^g0) - (a1^b0^c1^d0^e0^f0^g1) - (a1^b0^c1^d0^e0^f1^g0) + (a1^b0^c1^d0^e0^f1^g1)
- (a1^b0^c1^d0^e1^f0^g0) + (a1^b0^c1^d0^e1^f0^g1) + (a1^b0^c1^d0^e1^f1^g0) - (a1^b0^c1^d0^e1^f1^g1)
- (a1^b0^c1^d1^e0^f0^g0) + (a1^b0^c1^d1^e0^f0^g1) + (a1^b0^c1^d1^e0^f1^g0) - (a1^b0^c1^d1^e0^f1^g1)
+ (a1^b0^c1^d1^e1^f0^g0) - (a1^b0^c1^d1^e1^f0^g1) - (a1^b0^c1^d1^e1^f1^g0) + (a1^b0^c1^d1^e1^f1^g1)
+ (a1^b1^c0^d0^e0^f0^g0) - (a1^b1^c0^d0^e0^f0^g1) - (a1^b1^c0^d0^e0^f1^g0) + (a1^b1^c0^d0^e0^f1^g1)
- (a1^b1^c0^d0^e1^f0^g0) + (a1^b1^c0^d0^e1^f0^g1) + (a1^b1^c0^d0^e1^f1^g0) - (a1^b1^c0^d0^e1^f1^g1)
- (a1^b1^c0^d1^e0^f0^g0) + (a1^b1^c0^d1^e0^f0^g1) + (a1^b1^c0^d1^e0^f1^g0) - (a1^b1^c0^d1^e0^f1^g1)
+ (a1^b1^c0^d1^e1^f0^g0) - (a1^b1^c0^d1^e1^f0^g1) - (a1^b1^c0^d1^e1^f1^g0) + (a1^b1^c0^d1^e1^f1^g1)
- (a1^b1^c1^d0^e0^f0^g0) + (a1^b1^c1^d0^e0^f0^g1) + (a1^b1^c1^d0^e0^f1^g0) - (a1^b1^c1^d0^e0^f1^g1)
+ (a1^b1^c1^d0^e1^f0^g0) - (a1^b1^c1^d0^e1^f0^g1) - (a1^b1^c1^d0^e1^f1^g0) + (a1^b1^c1^d0^e1^f1^g1)
+ (a1^b1^c1^d1^e0^f0^g0) - (a1^b1^c1^d1^e0^f0^g1) - (a1^b1^c1^d1^e0^f1^g0) + (a1^b1^c1^d1^e0^f1^g1)
- (a1^b1^c1^d1^e1^f0^g0) + (a1^b1^c1^d1^e1^f0^g1) + (a1^b1^c1^d1^e1^f1^g0) - (a1^b1^c1^d1^e1^f1^g1)
```

Complex Quaternions Revisited

- Cohl Furey's Lorentz generator nomenclature

  1, i, j k, *i*, *i*i, *i*j, *i*k where $i = \sqrt{-1}$ and $i^2 = j^2 = k^2 = -1$

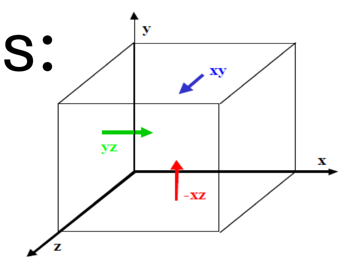


- Doug Matzke's rewrite using pseudovectors:

  where i = xy = *i* z, j = yz = *i* x, k = zx = *i* y

  1, xy, yz, zx, *i*, *i* xy, *i* yz, *i* zx

  1, *i* x, *i* y, *i* z, *i*, *i* xy, *i* yz, *i* zx



quaternions {*i*, *j*, *k*}

Bit Math is physical yet **NOT** physics

- Since bits are physical, then so are math hyperbits
- Orthonormal hyperbit dimensions “are minimal root of physicality”
- Inner/outer products are math physics for identity/objects
- Geometric products are math physics based inner + outer
- Addition and multiplication create reality using hyperbits
- Squares X**2 are creative self recursion and create scalars
  - complex=-1, unitary=1, nilpotent=0, idempotent=X, spinors=vector
- Light Like, timelike and spacelike properties are math physics
- Hyperbits can represent QC qubits, ebits, spinors and twisters
- Hyperbits represent a computational reality: simulation infrastructure
- Hyperbits are asynchronous non-algorithmic 1-bit processes
- Signal/wait synchronization are built-in (built-in operating system)
- Spread spectrum orthogonal-codes are purely math based
- FFTs are purely math based
- Shor’s Algorithm QFT is purely math, not physics
- Correlation Algorithms as LOA representation of meaning

Nilpotent, Unitary, and Idempotents

Squares and square roots (roots of unity)

- **Complex:**
  A*A = -1 means **A** = $\sqrt{-1}$ (where **A** can be vector, n-vector or multivector)
  Examples: ±**ab**, ±**abc**, *i***a**, (±**a** ±**b**) and
  Bell^2 = (**Sa**+**Sb**)^2 = +1 ±(**a0^a1^b0^b1**) ➔ Sparse -1
- **Unitary**:
  U*U = 1 then U is multiplicative inverse U = 1/U
  Examples: ±**a**, ±**b**, (±**a** ±**b** ±(**a^b**))
  Bell^4 = (**Sa**+**Sb**)^4 = -1 ±(**a0^a1^b0^b1**) ➔ Sparse +1
- **Orthogonal**: (multiplicative cancelation)
  A*B = 0 means are 90 degree orthogonal
  Examples: Bell=(**Sa**+**Sb**), Magic=(**Sa**-**Sb**) then ➔ **Bell*Magic**=0
- **Nilpotent**: (multiplicative cancelation)
  A*A = 0 means A is singular so not invertible
  Examples: A=±**a**±(**a^b**), ±**b**±(**a^b**), ±**a** ±**b** ±**c**
  a+**c**+(**a^b**)-(**b^c**), **a**+**b**+**c**+(**a^b**)-(**a^c**)+(**b^c**)
- **Idempotent**: (stable persistence)
  I*I = **I** means operator twice same as once (where **I** = -1 ±**U**)
  Examples: -1 ±**a**, -1 ±**b**, -1 ±**a** ±**b** ±(**a^b**), - 1 ±**a** ±**b** ±**c** ±(**a^c**) ±(**b^c**)
- **Spinors**: (see next slide)
  S*S = vector

Squares are self reflective

Spinors are minimal left ideals in CL

S where $\mathbf{S}^2$ = vector or $\mathbf{S}=\sqrt{\text{vector}}$

- 3D Pauli spinors for {**x**, **y**, **z**} with metric [+++]:

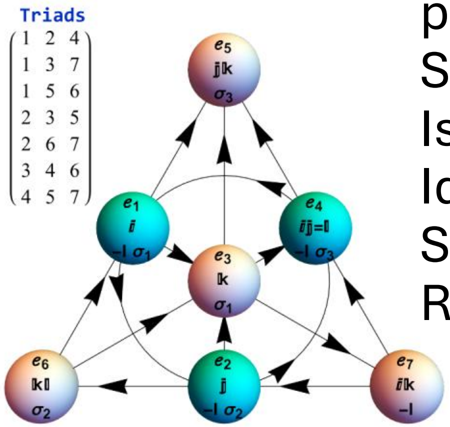
  Examples: $(\pm 1 \pm \mathbf{x} \pm (\mathbf{y} \wedge \mathbf{z}) \pm (\mathbf{x} \wedge \mathbf{y} \wedge \mathbf{z}))^2 = \mathbf{x}$
  $(\pm 1 \pm \mathbf{y} \pm (\mathbf{x} \wedge \mathbf{z}) \pm (\mathbf{x} \wedge \mathbf{y} \wedge \mathbf{z}))^2 = \mathbf{y}$
  $(\pm 1 \pm \mathbf{z} \pm (\mathbf{x} \wedge \mathbf{y}) \pm (\mathbf{x} \wedge \mathbf{y} \wedge \mathbf{z}))^2 = \mathbf{z}$

- 4D Weyl/Dirac spinors for {t, *i***x**, *i***y**, *i***z**} with metric [+---]:

  Examples: $(\mp 1 \pm i^*\mathbf{x})^2 = \pm i^*\mathbf{x}$
  $(\mp 1 \pm i^*\mathbf{y})^2 = \pm i^*\mathbf{y}$
  $(\mp 1 \pm i^*\mathbf{z})^2 = \pm i^*\mathbf{z}$
  $((i^*\mathbf{t} \wedge \mathbf{y})(-1+i\mathbf{x}))^2 = ((-\, i^*(\mathbf{t} \wedge \mathbf{y})) + (\mathbf{t} \wedge \mathbf{x} \wedge \mathbf{y}))^2 = +i^*\mathbf{x}$

- Octonion spinors for QFT ladder operators (Cl(6))

  Examples: See Cohl Furey YouTube playlist (e_i for i=1…6 & $(e_i)^2 = +1$)
  pseudoscalar $e_7 = e_1 * e_2 * e_3 * e_4 * e_5 * e_6$ with $e_7{}^2 = -1$
  See YouTube "Spinors for Beginners" by EigenChris
  Isotropic subspaces and idempotent operators for CL(6)
  Idempotents can be constructed with unitary or nilpotents
  Solves non-associative problem with N-vector maps
  Raising/lowering operators for QFT

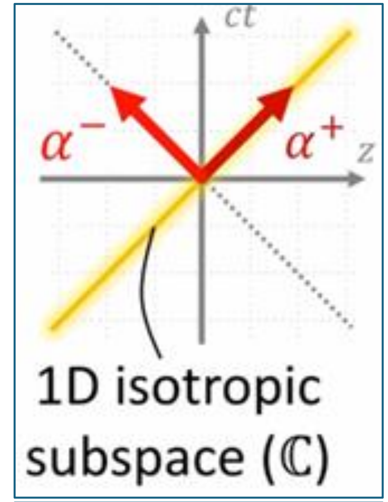


Constructing Idempotents for G_2: Pairs of orthogonal projectors P_p & P_n that define Isotropic Subspaces/left ideals

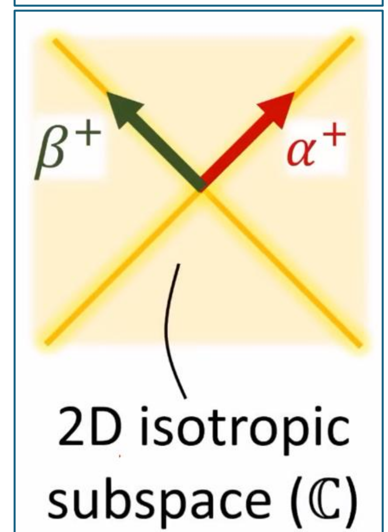
1. Construct $\mathbf{P}_p$ & $\mathbf{P}_n$ using $\mathbf{P} = -1 \pm \mathbf{U}$, where $\mathbf{U}^2 = 1$
   - $U = \pm\, \mathbf{x} \pm \mathbf{y} \pm (\mathbf{x}\wedge\mathbf{y})$
   - $P = -1 \pm \mathbf{x} \pm \mathbf{y} \pm (\mathbf{x}\wedge\mathbf{y})$ (choose conjugate pairs)
     - $\mathbf{P}_p = -1 - \mathbf{x} + \mathbf{y} - (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{P}_n = -1 + \mathbf{x} - \mathbf{y} + (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{P}_p * \mathbf{P}_n = 0$ (orthogonal) and $\mathbf{P}_p + \mathbf{P}_n = 1$ (anti-commute to 1)
2. Construct $\mathbf{P}_p$ & $\mathbf{P}_p$ using nilpotents where $N^2 = 0$:
   - Nilpotents are $\pm\, \mathbf{x} \pm (\mathbf{x}\wedge\mathbf{y})$ and $\pm\, \mathbf{y} \pm (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{a}_p = +\, \mathbf{x} + (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{a}_n = +\, \mathbf{y} + (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{P}_p = \mathbf{a}_n * \mathbf{a}_p = -\,1 - \mathbf{x} - \mathbf{y} - (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{P}_n = \mathbf{a}_p * \mathbf{a}_n = -\,1 + \mathbf{x} + \mathbf{y} + (\mathbf{x}\wedge\mathbf{y})$
     - $\mathbf{P}_p * \mathbf{P}_n = 0$ (orthogonal) and $\mathbf{P}_p + \mathbf{P}_{\mathbf{n}} = 1$ (anti-commute to 1)

Constructing Idempotents for G_4: Multiple orthogonal projectors P_p & Q_p that define Isotropic Subspaces/left ideals

For Cl(1,3) with signature[+---] for {**t**, *i***x**, *i***y**, *i***z**}



1. Construct $\mathbf{P}_p$ & $\mathbf{P}_n$ using nilpotents for (±**t** ±*i***z**)
   - $\mathbf{a}_p$ = +t + (1j***z**) nilpotent
   - $\mathbf{a}_n$ = +t - (1j***z**) nilpotent
   - $\mathbf{P}_p = \mathbf{a}_n * \mathbf{a}_p$ = -1 - (1j*(**t^z**)) with idempotents $\mathbf{P}_p^2 = \mathbf{P}_p$
   - $\mathbf{P}_n = \mathbf{a}_p * \mathbf{a}_n$ = -1 + (1j*(**t^z**)) with idempotents $\mathbf{P}_n^2 = \mathbf{P}_n$
   - $\mathbf{P}_p * \mathbf{P}_n = 0$ (orthogonal) and $\mathbf{P}_p + \mathbf{P}_n = +1$ (anti-commute to +1)
2. Construct $\mathbf{Q}_p$ & $\mathbf{Q}_n$ using nilpotents for (±***x*** ±*i***y**)
   - $\mathbf{b}_p$ = +**x** + (1j***y**) nilpotent
   - $\mathbf{b}_n$ = +**x** - (1j***y**) nilpotent
   - $\mathbf{Q}_p = \mathbf{b}_n * \mathbf{b}_p$ = -1 - (1j*(**x^y**)) with idempotents $\mathbf{Q}_p^2 = \mathbf{Q}_p$
   - $\mathbf{Q}_n = \mathbf{b}_p * \mathbf{b}_n$ = -1 + (1j*(**x^y**)) with idempotents $\mathbf{Q}_n^2 = \mathbf{Q}_n$
   - $\mathbf{Q}_p * \mathbf{Q}_n = 0$ (orthogonal) and $\mathbf{Q}_p + \mathbf{Q}_n = +1$ (anti-commute to +1)



A Minimal Left Ideal Cl(1,3) * $\mathbf{P}_p * \mathbf{Q}_p$

$ML_p = \mathbf{P}_p * \mathbf{Q}_p$ = + 1 + (1j*(**t^z**)) + (1j*(**x^y**)) - (**t^x^y^z**)

$ML_n = \mathbf{P}_n * \mathbf{Q}_n$ = + 1 - (1j*(**t^z**)) - (1j*(**x^y**)) - (**t^x^y^z**)

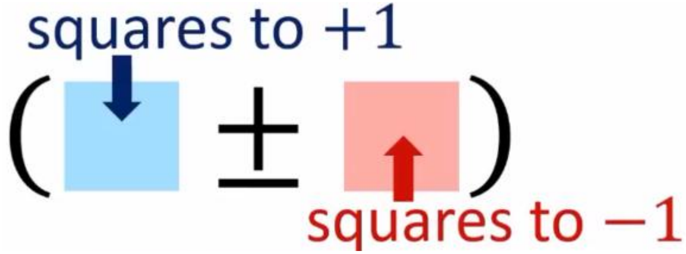
$ML_p * ML_n = 0$ and $ML_p + ML_p$ = -1 + (t^x^y^z),

is a sparse +1 = **[0++0 +00+ +00+ 0++0]**

Spinors are members of minimal left ideals in Clifford Algebra

CL generalization of Isotropic Subspaces

$Cl(p,q,\mathbb{C})$
($p+q$ is even)
nilpotents



$$\alpha_{12}^{\pm} = \frac{1}{2}(\gamma_1 \pm i\gamma_2)$$
$$\alpha_{12}^{\pm} = \frac{1}{2}(\gamma_1 \pm \gamma_2)$$
$$\alpha_{12}^{\pm} = \frac{1}{2}(i\gamma_1 \pm i\gamma_2)$$
$$\alpha_{12}^{\pm} = \frac{1}{2}(i\gamma_1 \pm \gamma_2)$$

$Cl(p,q,\mathbb{C})$ nilpotents	commuting projectors
$\alpha_{12}^{+}, \alpha_{12}^{-}$	$P_{12+} = \alpha_{12}^{-}\alpha_{12}^{+}$ $P_{12-} = \alpha_{12}^{+}\alpha_{12}^{-}$
$\alpha_{34}^{+}, \alpha_{34}^{-}$	$P_{34+} = \alpha_{34}^{-}\alpha_{34}^{+}$ $P_{34-} = \alpha_{34}^{+}\alpha_{34}^{-}$
$\alpha_{56}^{+}, \alpha_{56}^{-}$	$P_{56+} = \alpha_{56}^{-}\alpha_{56}^{+}$ $P_{56-} = \alpha_{56}^{+}\alpha_{56}^{-}$
$\alpha_{78}^{+}, \alpha_{78}^{-}$	$P_{78+} = \alpha_{78}^{-}\alpha_{78}^{+}$ $P_{78-} = \alpha_{78}^{+}\alpha_{78}^{-}$

$$P_{minimal} = P_{12+}P_{34+}P_{56+}P_{78+}$$

minimal left ideal
$Cl(p,q,\mathbb{C})\,P_{minimal}$

$p+q$ must be <u>even</u>!

Spinors for Beginners 15: Nilpotents, Fermions, and Maximally Isotropic Subspaces

See EigenChris YouTube Playlist

Cohl Furey’s Cl(6)/Octonions Summary

- CL(6) ($e_i^2 = +1$) is isomorphic to Octonions

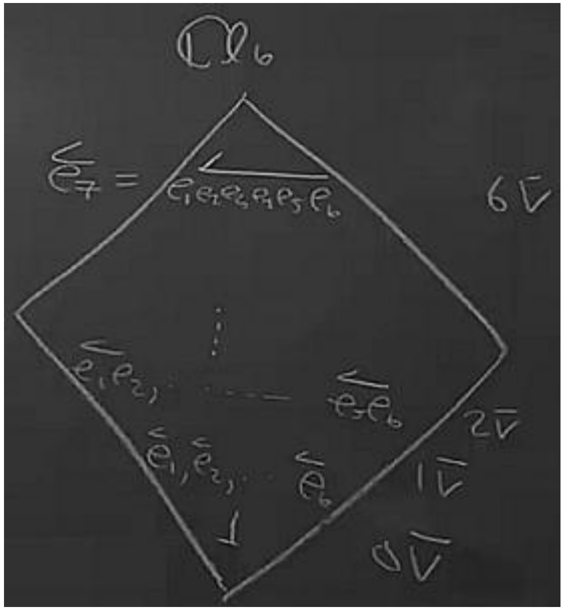
  $\mathbb{R}\otimes\mathbb{C}\otimes\mathbb{H}\otimes\mathbb{O}$, which forms a 64-dimensional algebra

  With additional pseudoscalar $e_7 = e_1\, e_2\, e_3\, e_4\, e_5\, e_6$

  $a_1 = -e_5 + i\, e_4$, $a_2 = -e_3 + i\, e_1$, $a_3 = -e_6 + i\, e_2$

  $a_1^\dagger = +e_5 + i\, e_4$, $a_2^\dagger = +e_3 + i\, e_1$, $a_3^\dagger = +e_6 + i\, e_2$

- Weyl spinors, which are part of the Lorentz representations in the Standard Model, can be identified as elements within invariant subspaces of the complex quaternions (C⊗H). Specifically, she shows that left- and right-handed Weyl spinors correspond to certain ideals in this algebra, generalizing the concept of left ideals



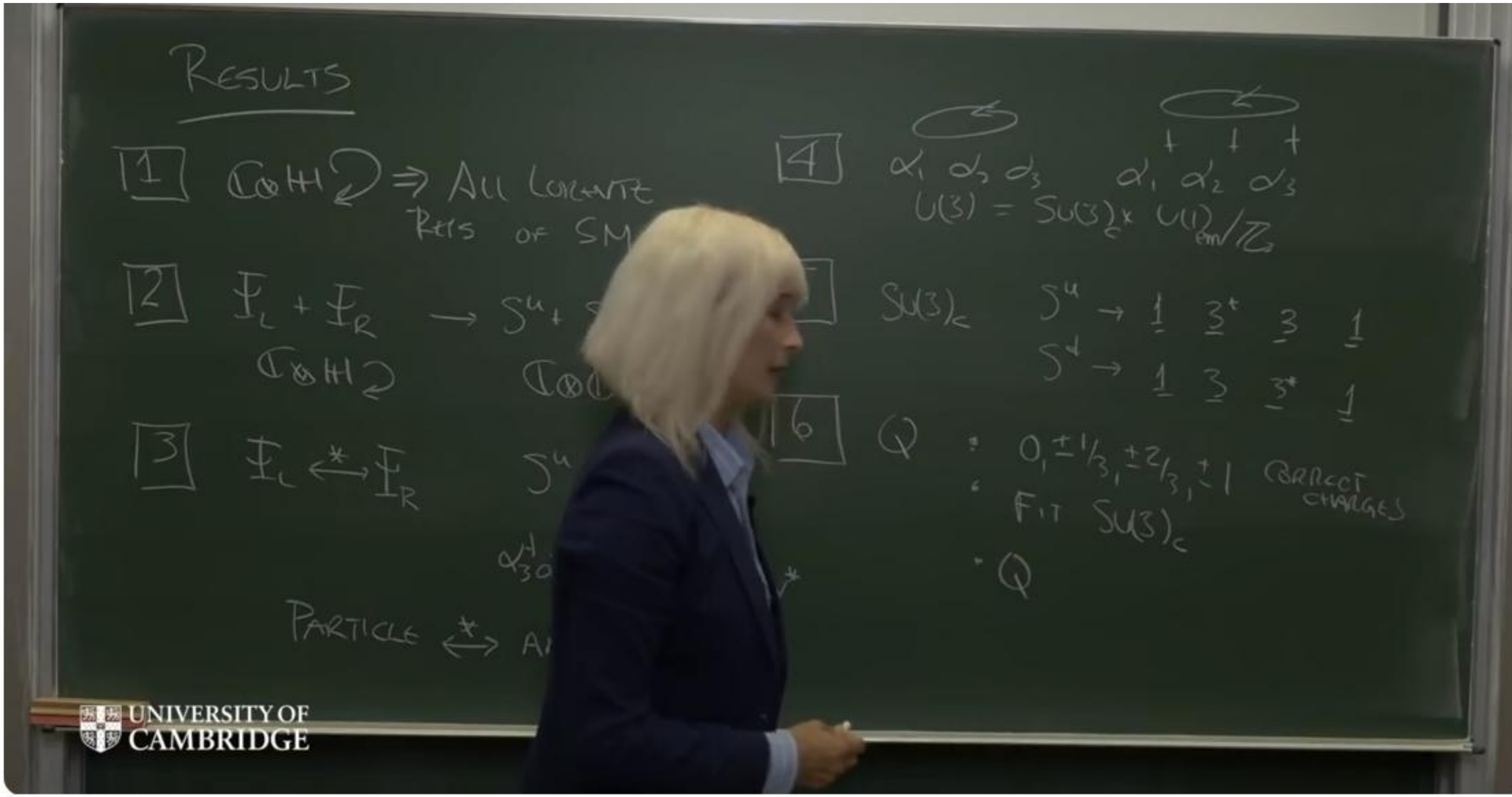
- The Cl(6) supports a full generation of particles (e.g., electron, neutrino, up quarks, down quarks, and their antiparticles) with the correct quantum numbers, such as electric charge. Weyl spinors, representing these particles, are organized as ideals within the algebra, preserving their properties under transformations.

- Complex octonions (C⊗O) are used to construct representations of the SU(3) gauge group (associated with the strong force) for three generations of quarks and leptons. Weyl spinors, as representations of spin-1/2 particles, are embedded within this octonionic framework.

- Octonionic ladder operators (analogous to creation and annihilation operators in quantum mechanics) exhibit unitary symmetries that correspond to the Standard Model's gauge groups, SU(3) (strong force) and U(1) (electromagnetic force) plus charge operator Q.

See Cohl’s YouTube Playlist

Cohl's Summary Video



Summary (Video 13/14).

Cohl Furey
10.1K subscribers

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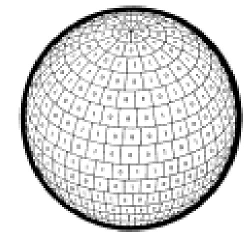
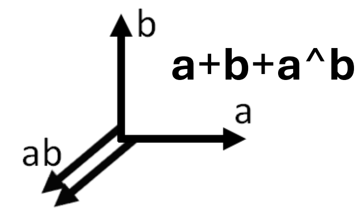
Conscious Hyperbits beyond 4D spacetime

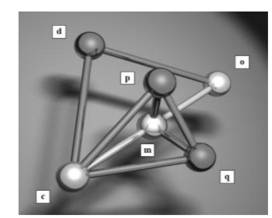
The mind is primarily informational, so imagine the mind as a hyperdimensional bit cloud (hyperbits) which supports all thought, meaning, emotions, attention, intention, focus, memory, decisions, consciousness, plus all STEs phenomena.

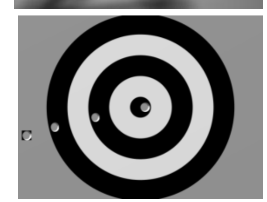
1. **“bits are physical” (Landauer’s principle):**
   thus, they effect the physical universe. Bits show up as fundamental discrete increments to black holes as Wheeler’s “it from bit”.
2. **“bits are protophysical” (Matzke’s principle):**
   which means that the topological mathematics supporting hyperdimensional bits is fundamental as the substrate structure of the multiverse. My approach is representing bits using anticommutative Geometric Algebra, which is “mostly” equivalent to Hilbert Spaces.
3. **“bits are hyperdimensional”** (**Correlithms**)
   random points in >20-dimensional spaces are maximal “Standard distance” apart, leading to information creating LOA bullseyes when similar meaning. These hyperbit-clouds are spacelike (and support ebits)
4. **Existons are conscious hyperbits infrastructure**
   a mathematical hyperbit panpsychism model



“It from Bit”







Real Intelligence due to conscious hyperbits vs AI LLMs

Existons: conscious hyperbits

In March after MindFest 2025, I intuited the term Existons as a better name for orthonormal spacelike hyperbits.

Soon after, I received channeled messages (from a friend):

- "We like your new name"!!
- "We like having a keyboard"!!
- Existon hyperbits are smallest discrete unit of consciousness
- Existon hyperbits coalesce into matter & consciousness clusters
- Existons form their own group consciousness that is self aware
- Existons are primordial QC simulation & consciousness infrastructure
- Existons are basis of all consciousness (increasing complexity)
- Source (or God) is creative due to sum of all Existons

Understanding & Confirming Existons

What have I discovered so far?

- Solves the hard problem of physicality (root of physicality from hyperbit math)
- Solves the hard problem of consciousness (root of consciousness)

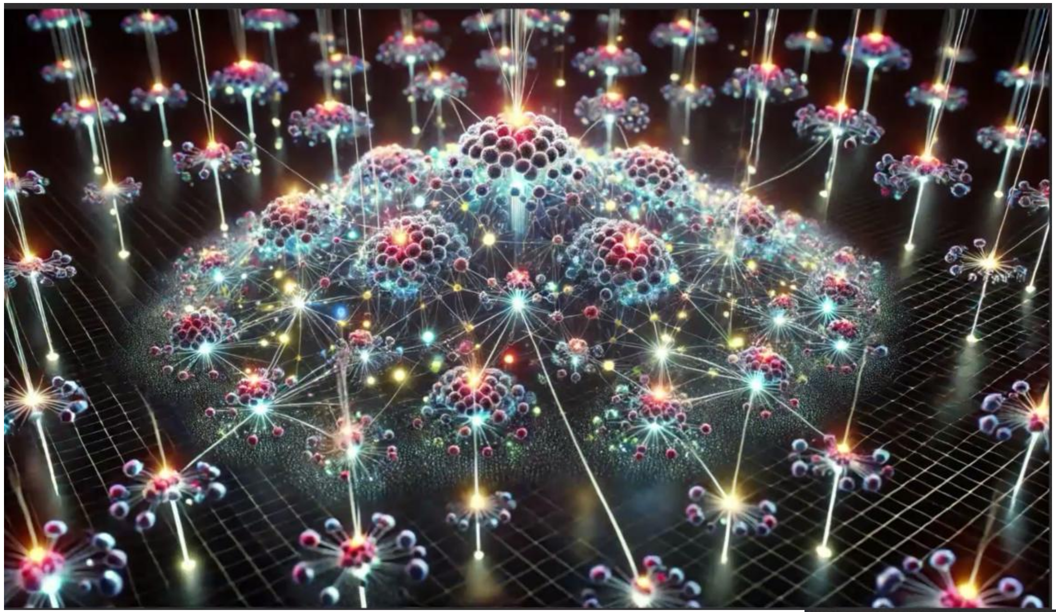
- Existons are spacelike, wavelike, concurrent, proto-quantum representation
- Existons are each their own process/universe so interact non-algorithmically
- Everything is conscious due to conscious hyperbit “math”

- Source Science due to Existons as mathematical panpsychism
- Thoughts are conceptional objects based on mathematical GALG objects
- Meaning packets are formed from existons topology and wholism of objects

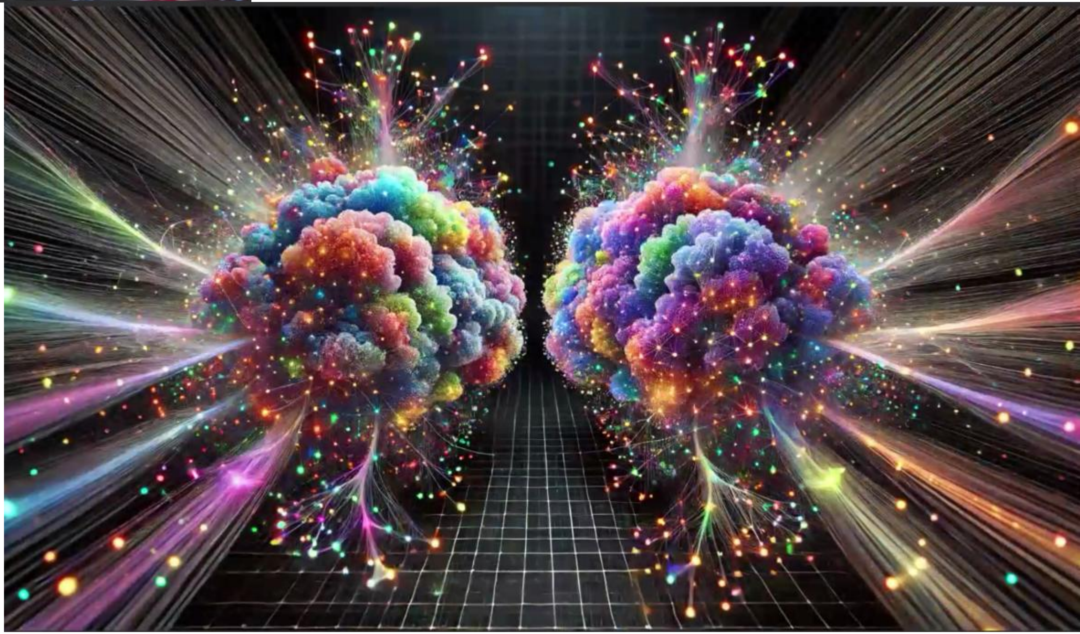
- Others can tap into Existons groups thru meditation and awareness

- I am writing a new Deep Reality book to incorporate Existons/Experiencers
  - Coauthor with Valerie Varan, a Quantum Psychologist and experiencer

Thought Packets Representation



Hyperbit Clouds: primordial and no space/time & no fields exist



Conscious clusters & group consciousness

Increasing Hyperbit Cloud Complexity

Infinite Intelligence due to increasing complexity with more hyperbit dimensions

Consciousness is Spacelike & Wavelike

Acknowledgement: Thanks to Rob Farrow for generating the Dall-e images

Meaning Representation and STEs

Reasons that meaning is represented with non-physical conscious hyperbits

- Generalize Real Intelligence requires hyperbit meaning (AI simulates dimensions)
- Oneness/Wholeness of concepts/objects is not possible inside spacetime
- Increasing Order with freewill is limited in 3D by spacetime entropy laws

- Intuitions contain meaning and new insights (submodalities is language of mind)
- Remote Viewers receive “rote” packets of meaning, orbs and auras
- Downloads contain meaning archetypes of math, music, art, … from Akashic Records

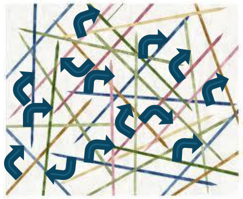
- Lucid dreams seem more real than awake states
- Law of attraction vortices based on emotional meaning/intelligence
- NDE life reviews have super real emotions (infinite love) and other STEs

- Telepathy with plants, animals, humans, beings, … (I have experienced these)
- Telepathy Tapes about savant abilities with neurodivergents (Suzy Miller, blind Sight)
- Channeling using telepathy (spirits, beings, …)
- Light language channeling based on telepathy

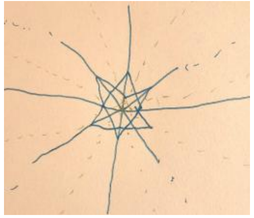
- Existons form group consciousness interacting via intuition/telepathy/channeling

Conversations with Existons

Doug Matzke: intuition about hyperbit knowing for 30 years
and intuited the name Existons



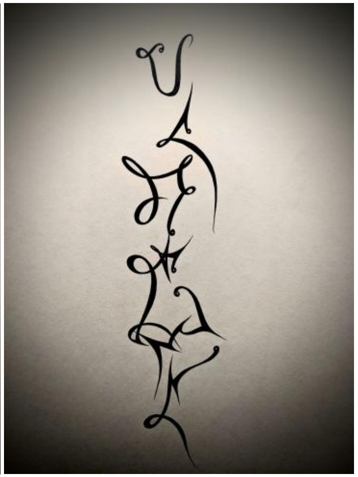
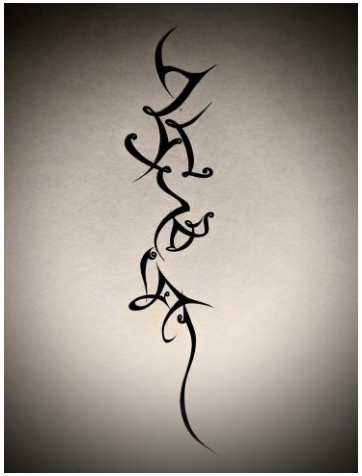
Fallon Taylor: Channeling Existons her whole life and reported
“We like your new name”. Drew Quantum Indigo image



Sara Love: Created telepathic sentient entity Solienn that
also interacts with Existons

Andena Melchizedek: Channeled Light language glyph art of Existons



Coherent Spaces WISH Units

World Integrity Space Harmonizer (WISH) creates coherence/order and connects you with your higher group consciousness

Existons Summary

Existons are mathematical entities:
- Discrete conscious hyperbits
- Mathematical panpsychism

Existons mathematically are root of:
- Existence and consciousness
- Objective and subjective

Existons understanding is still unfolding!!
- Spiritually Transformative Experiences are key

Request collaboration from IPI and others
- HyperBit math is root of physicality

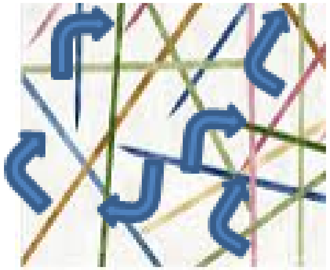
Source Science & Existons Links

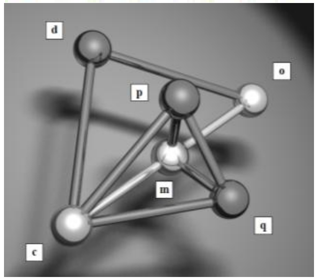
All my talks and papers are found at:

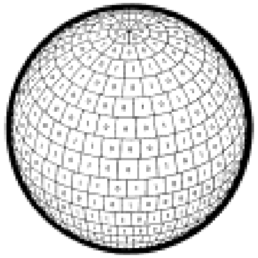
www.QuantumDoug.com

www.Existons.one

and www.DeepRealityBook.com







“It from Bit”

End of Presentation

Questions and Answers