From VOID to Knot Frank Dodd (Tony) Smith's Cl(16) Programme and the Strand-Knot Framework

J.Konstapel,Leiden,15-7-2026.

Abstract

Frank Dodd (Tony) Smith, Jr.'s self-published book *Cl(16): Science, Art, Music* (viXra, 2019) proposes that a single reál Clifford algebra, Cl(16), generates spacetime, the Standard Model, gravity, and — by extension — the deep structure of art, music, and archetype. Independently, the constable.blog essay "The Strand That Knots Itself" (Konstapel, 2026) describes a cascade of seven "tensions" — difference, orientation, place, path, object, category, logic — through which a single self-crossing strand is said to generate everything from the electron's spin to the structure of mind. This essay lays the two frameworks side by side, section by section, and asks a narrow question: where does the correspondence hold on the terms of the source texts themselves, and where is it an interpretive bridge supplied by the comparison? The exercise is offered as a structural analysis, not a proof of equivalence — both source frameworks sit outside peer-reviewed physics, and the essay tries not to let its own synthesis outrun that fact.

1. Introduction

Smith's book is 422 pages, freely available on viXra (not arXiv), and represents roughly thirty-five years of independent work by a student of physicist David Finkelstein. It is organized in five parts: real Clifford algebras (Part I), Cl(16) physics proper — force strengths, particle masses, cosmological ratios (Part II), a reading of Duchamp, Beethoven, and Jung through the same algebra (Part III), a cosmic-to-personal history (Part IV), and a chapter on deuterium cold fusion (Part V). The present essay concentrates on Parts I–III, since these are where the structural comparison with the Strand-Knot framework is most direct.

"The Strand That Knots Itself" begins from George Spencer-Brown's *Laws of Form* — "draw a distinction, and nothing more is needed" — and Louis Kauffman's reading of that axiom as a form observing its own form. It proposes that a single strand, given room to cross itself, generates a graded cascade of stabilities: difference, orientation, place, path, object, category, logic. The electron, on this account, is not a point particle that happens to spin; it is the Williamson–van der Mark toroidal photon model, quaternion-closed at 4π rather than 2π, read as "what a strand becomes when it insists on remembering where it has been."

Both texts, in other words, begin with a bare pre-structure and claim to *derive* physical content — rather than stipulate it — from how far a single generative process has been carried. That shared move is the reason the comparison is worth making carefully.

2. The VOID Fluctuation and the Finkelstein Iteration

Smith attributes the starting point to Finkelstein: our universe originates as a fluctuation in a "VOID" within a parent universe, and unfolds thereafter as an iterated sequence of real Clifford algebras, each step roughly squaring the dimension of the last:

Step	Algebra	Interpretation	Dimension
Cl(VOID)	Z (integers)	the fluctuation itself; the first countable distinction	0-dim
Cl(0)	R (reals)		1-dim
Cl(1)	C (complex numbers)		2-dim
Cl(2)	H (quaternions)		4-dim
Cl(4)	M_2(H)	2×2 quaternion matrices	16-dim
Cl(16)	M_{256}(R)	256×256 real matrices	65,536-dim

The iteration halts at Cl(16) because, Smith states, its 16-dimensional vector part develops zero divisors (via the Spin(7)/Spin(5) fibration; he cites arXiv math/0512517), and because 8-periodicity gives Cl(16) = Cl(8) ⊗ Cl(8) — a factorization that becomes the load-bearing move for everything that follows in Part I.

This is the cleanest point of contact with the Strand-Knot cascade's first level, "difference": a field of undifferentiated potential, "not yet crossing itself," that precedes any geometry. Cl(VOID) = Z is offered by Smith in exactly that spirit — a bare countability prior to any metric or algebraic structure.

3. From Cl(8) to E8: The Load-Bearing Construction

The physically consequential move in Part I is the factorization Cl(16) = Cl(8) ⊗ Cl(8). Each Cl(8) factor carries a 28-dimensional D4 Lie algebra as its bivector part; combining the two D4's via the 600-cell / golden-ratio construction (following Coxeter) yields 120 + 120 = 240 root vectors — the root system of E8. Smith writes this as H4 + H4 = E8.

Cl(16) itself then decomposes as:

- 16 vectors → spacetime (Shilov boundary of a bounded complex domain)
- 120 bivectors + 128 half-spinors = 248 → the E8 Lie algebra (gauge bosons and fermions)
- 560 trivectors → ten copies of the 56-dimensional Freudenthal algebra Fr_3(O), which Smith identifies with a 26-dimensional string/world-line theory
- the remaining 64,712 elements → what Smith calls "information carriers"

Two features of this construction are worth flagging for the comparison in Section 4. First, Smith states explicitly that "strings are physically interpreted as world-lines" (p. 10) — a literal, not metaphorical, use of the word *path*. Second, the trivector sector is where he later attaches the Bohm quantum potential and, further on, Penrose–Hameroff quantum consciousness (p. 205) — the same sector that carries both the physics and the "mind" content of the book.

4. Mapping the Seven Tensions onto the Cl(16) Construction

The Strand-Knot essay's cascade — difference, orientation, place, path, object, category, logic — read as increasing degrees of tension in a single self-crossing strand, admits a stepwise comparison against Smith's construction. The table below states, for each step, both the proposed correspondence and an honest assessment of how much of it is supported by Smith's own text versus supplied by the comparison itself.

Tension	Cl(16) construction	Basis in Smith's text
1. Difference —	Cl(VOID) = Z, the first countable distinction prior to any geometry	Strong — this is Smith's own framing, not an imported reading
2. Orientation — the	Cl(1)→Cl(2): C→H. Quaternions are the first non-commutative step, and non-commutativity is the algebraic seat of chirality/	Strong — quaternions are also the explicit algebra of the Williamson–van der Mark rotor in the Strand-Knot essay's own account of the electron; this is the same algebra, not an analogy between two different
3. Place — orientation located	Cl(4) = $M_2(H)$, 2×2 quaternion matrices	Weak — Smith gives no "place" reading of Cl(4); this row is supplied by the comparison, not by the source text
4. Path — the knot	Cl(8) trivectors = $Fr_3(O)$ → 26D string=world-line theory	Very strong — Smith's own language ("strings are physically interpreted as world-lines," p. 10) is close to verbatim agreement with "path"
5. Object — a path pulled tight	Cl(16) bivectors + half-spinors → named Standard Model particles (fermions, gauge bosons)	Strong — this is precisely the step where free algebraic structure is asserted to freeze into nameable objects
6. Category — many	The 240 E8 root vectors = 112 D8 roots + 128 half-spinors, unifying all particle content into a single root system; Smith's own	Strong — E8 functions here exactly as the categorical container the comparison proposes
7. Logic — wound so tight	The nilpotent BRST/ghost formalism Smith cites from Weinberg: D = d + s, nilpotent because $s^2 = d^2 = sd + ds = 0$ (p.	Strong, and independently notable: this is the same nilpotency logic used in Peter Rowlands' Universal Rewrite System, which is a cited foundation of the author's own General Strand Principle (GSP) work —

Four of the seven rows (1, 4, 6, 7) rest on close paraphrase or direct citation of Smith's own language. One row (3) is flagged here as the comparison's own construction, introduced for completeness of the cascade rather than because Smith offers it. This asymmetry is reported rather than smoothed over, since a table that looks uniformly strong would misrepresent the actual evidentiary weight of each step.

5. Part III: Art, Music, and Jung's Red Book

Smith's claim in Part III is not that art and music *resemble* Cl(16) physics, but that they are independent perceptual channels onto the same underlying structure — a claim directly analogous to the Strand-Knot essay's assertion that "spin, charge, and orientation are what the crossing looks like in the electron; place, path, and meaning are what the crossing looks like in a mind."

Art — Duchamp's *Large Glass* + mirror image. The two halves of the work are read as the two Cl(8) factors of Cl(16) = Cl(8) ⊗ Cl(8); the "eight paddle wheels" are read as the two 28-dimensional D4 Lie algebras — one for gravity + dark energy, one for the Standard Model. Smith draws a historical line back through Ramon Llull's 700-year-old "X-wheel" (16 vertices, 120 lines), which Smith identifies with the 16 vectors and 120 bivectors of Cl(16), and which Llull is said to have derived in part from West African Ifá divination systems.

Music — Beethoven's *Grosse Fuge*. Smith argues that the opening and overture of Opus 133 (1825) reflects the same Cl(16)–E8 structure, despite predating the mathematical discovery of Lie, Killing, and Clifford algebras by roughly fifty years. His proposed mechanism: the human brain already instantiates Cl(16)-like structure via microtubules (a 40-micron microtubule holds approximately 65,536 tubulin dimers — exactly the dimension of Cl(16)), so that a deafened Beethoven, composing by internal audition, was in effect "seeing" E8 inside Cl(16) and transcribing it. Smith cites Beethoven's own annotation on the later Opus 135 — "*Muss es sein?*" / "*Es muss sein!*" ("Must it be?" / "It must be!") — as evidence of Beethoven's own struggle with the necessity of what he had written.

Jung — Das Rote Buch. The shortest but conceptually densest section links Jung's archetypes to the layered E8 construction: the compact real form E8(-248) for the Clifford iteration itself, the split form EVIII for octonionic inflation, and EIX for the quaternionic expansion that yields the three fermion generations. Smith quotes Rudolf Steiner on a caduceus form in his Goetheanum building — "*I did not create a caduceus; I allowed the previous forms to grow. The form originated on its own*" — as support for Jung's claim that archetypes are built into the structure of the human mind, and, in Smith's reading, ultimately into Cl(16) itself.

6. Points of Convergence and Points of Divergence

Where the two frameworks converge most strongly:

1. Both begin from a bare, pre-geometric distinction (VOID / uncrossed strand) rather than positing entities from outside the system.
2. Both use the *same* physical anchor — the Williamson–van der Mark toroidal photon/electron model, closing at 4π rather than 2π — as the concrete case where the abstract cascade touches measurable physics.
3. Both derive properties (spin, charge, particle masses on one side; orientation, place, meaning on the other) as *consequences of the degree of self-reference achieved*, not as independently stipulated facts.
4. The nilpotency argument in Smith's BRST discussion (Section 4, row 7) and the nilpotent quantum mechanics of Rowlands' Universal Rewrite System, which underlies the author's own GSP papers, are structurally the same move: physical necessity read off from an operator squaring to zero.

Where they diverge:

1. Smith's programme is quantitative in a way the Strand-Knot essay is not: it claims specific, calculated force strengths, particle masses, and cosmological ratios (dark energy : dark matter : ordinary matter ≈ 0.75 : 0.21 : 0.04), checked against CMS and Fermilab data — though, again, published on viXra and not peer-reviewed.
2. The Strand-Knot essay is explicitly topological and philosophical; it offers one physical anchor (the electron) rather than a calculational program for masses and couplings.
3. Smith's extension into art, music, and archetype is total and literal — he asserts that Beethoven perceived E8 directly. The Strand-Knot essay's extension into "meaning" and

"mind" is comparatively restrained, offered as a structural analogy across domains rather than a claim about what any historical individual consciously perceived.

7. A Note on Epistemic Status

Both source texts sit outside mainstream, peer-reviewed physics. Smith's book is self-published on viXra; the Strand-Knot essay is a synthesis piece on a personal research blog, drawing on a set of working papers (listed below) that are themselves not peer-reviewed. The mathematics common to both — Clifford algebra periodicity, E8 root systems, quaternion non-commutativity, the Freudenthal algebra $Fr_3(O)$ — is standard, correct, and independently verifiable. The physical and interpretive claims built on top of that mathematics (that Beethoven perceived E8, that archetypes *are* Cl(16), that a specific DE:DM:OM ratio follows from the geometry) are Smith's own non-mainstream interpretations, and the correspondences drawn in Section 4 between that programme and the Strand-Knot cascade are this essay's own construction, offered as a structural hypothesis rather than a demonstrated identity. Where a row in Section 4's table is weakly supported by Smith's source text (notably row 3), that has been marked as such rather than folded into an appearance of uniform agreement.

Annotated Reference List

Primary sources under comparison

Smith, Frank Dodd (Tony), Jr. *Cl(16): Science, Art, Music*. viXra:1905.0568, 2019. The primary text discussed throughout this essay. 422 pages; five parts covering real Clifford algebras, Cl(16) physics (force strengths, masses, cosmological ratios), art/music/Jung, cosmic-to-personal history, and deuterium cold fusion. Self-published, not peer-reviewed. Cited repeatedly for the VOID-iteration table (Section 2), the Cl(8)⊗Cl(8)=Cl(16) construction (Section 3), and the art/music/Jung readings (Section 5).

Konstapel, J. "The Strand That Knots Itself." constable.blog, July 9, 2026. The source of the seven-tension cascade (difference, orientation, place, path, object, category, logic) mapped against Smith's construction in Section 4. Synthesizes several working papers (listed below) with George Spencer-Brown's *Laws of Form* and Louis Kauffman's reading of it.

Working papers cited within "The Strand That Knots Itself"

Konstapel, J. "Self-Resonance Before Orientation: A Quaternion Electrodynamic Candidate for the Physical Substrate of the Conservation Cascade." The paper grounding the electron/orientation correspondence used in Section 4, row 2 of this essay; supplies the quaternion-rotor account of the Williamson–van der Mark model.

Konstapel, J. "Orientation Before Place: A Structural History of Successive Conservations — and One Recovery — in the Formation of Objects." Develops the orientation → place transition referenced, with reservations, in Section 4, row 3.

Konstapel, J. "Place, Path, Rewrite." and **"Place Before Object."** Source material for the place → path → object sequence of the cascade (Section 4, rows 3–5).

Konstapel, J. "From Distinction to Quaternion Geometry." Bridges Spencer-Brown's bare distinction to the quaternion formalism used throughout; relevant to Section 4, row 1.

Konstapel, J. "The Gentzen–Altshuller Fusion: Architecting Inventive Mathematical Discovery." Cited in the source essay for the claim that genuinely new mathematics is found at the seam between opposing tensions (Gentzen's cut, Altshuller's contradiction) rather than by tightening in an already-favored direction; informs the epistemic caution of Section 7 here.

Konstapel, J. "Quaternionic Reformulation of the Williamson-van der Mark Toroidal Photon Model." The specific technical anchor for the 4π-closure claim discussed in Sections 1 and 6 of this essay.

Foundational sources cited by both frameworks

Spencer-Brown, George. *Laws of Form*. 1969. Origin of "draw a distinction, and nothing more is needed" — the starting axiom of the Strand-Knot cascade (Section 1).

Kauffman, Louis H. Writings on eigenform and re-entry, following Spencer-Brown. Supplies the "form observing its own form" reading used to motivate the strand's self-crossing (Section 1).

Williamson, Ray, and Martin van der Mark. Toroidal photon/electron model. The shared physical anchor discussed in Section 6, point 2 — a photon closing on itself as a torus rather than propagating outward indefinitely, with spin, charge, and magnetic moment falling out of a single 4π-closure condition.

Finkelstein, David. "Space-Time Code. III." *Physical Review D* (1972): 2922–2931. Cited by Smith as the origin of the string=world-line interpretation used in Section 3; Finkelstein is also, biographically, Smith's doctoral advisor and the source of the VOID-iteration idea discussed in Section 2.

Rowlands, Peter. Nilpotent quantum mechanics / Universal Rewrite System. Not directly cited in either primary source text, but flagged in Section 4, row 7 and Section 6, point 4 as the structural parallel to Smith's nilpotent BRST citation — and as an existing foundation of the author's own General Strand Principle papers.

Secondary sources cited within Smith's Cl(16) book, referenced in this essay

Coxeter, H. S. M. "Regular and Semi-Regular Polytopes III." Source of the two-dimensional H4/E8 root-vector visualization Smith uses for the 240-root-vector construction (Section 3).

Weinberg, Steven. *The Quantum Theory of Fields*, Vol. II, Section 15.7. Source of the nilpotent BRST operator quotation ($D = d + s$, $D^2 = 0$) discussed in Section 4, row 7.

Thierry-Mieg, Jean. *Journal of Mathematical Physics* 21 (1980): 2834–2838. Cited by Smith alongside Weinberg for the geometric interpretation of ghosts and BRST symmetry underlying the same nilpotency argument.

Campoamor-Stursberg, Rutwig. "Contractions of Exceptional Lie Algebras and SemiDirect Products." *Acta Physica Polonica B* 41 (2010): 53–77. Cited by Smith for the E8 maximal-contraction Heisenberg algebra structure (28 + 64 + (A7+1)) underlying the spacetime creation/annihilation reading in Section 3.

Bradonjic, Katarina, and John Stachel. arXiv:1110.2159. Cited by Smith on unimodular relativity's conformal-metric decomposition, relevant to the D4-for-gravity reading in Section 3.

Bonner, Anthony. *Doctor Illuminatus* (on Ramon Llull). Source of the historical material on Llull's "X-wheel," used in Section 5's discussion of Duchamp and, via Part IV of Smith's book, Llull's place in 13th-century scholasticism.

Malinowski, Stephen. Visualizations of Beethoven's *Grosse Fuge*. Source of the visual correspondences Smith uses to argue for a structural match between the score and the E8 root system (Section 5).

This essay is a structural comparison exercise between two non-mainstream research programmes. It does not constitute an endorsement of either programme's physical claims, and the correspondences proposed in Section 4 and Section 6 are offered as hypotheses for further formalization, not as established results.