



# laetus in praesens

Alternative view of segmented documents via Kairos

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1 October 2025 | Draft

## Beyond both Rhyme and Reason in the Face of Polycrisis?

Memorable correspondences between Dante's poesis, trigrams, genetic codons, triplicities, and polyhedra

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### Introduction

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## Introduction

Much interest has been evoked by the challenge of AI and the potential of [quantum computing](#). The latter is based on the obscurities of [quantum mechanics](#) of which it has been famously asserted by [Richard Feynman](#) that if anyone claims to understand quantum mechanics they clearly do not understand quantum mechanics -- on which many continue to comment. And yet it clearly "works" as a theory, as so obviously exemplified by the viability of quantum computing.

The question could then be asked of other frameworks deemed to be fundamental to the understanding of reality. For example, is it the case that those claiming to understand deity in any form should be recognized as "not understanding" deity? And yet their understanding clearly "works" -- for them. The irony is that the contrasting understandings of deity, notably by the Abrahamic religions seem to have contributed especially significantly to conflict over centuries, and to the current highly fragmented condition of a global civilization society faced with [polycrisis](#) (*Fundamental Need for Human Sacrifice by Abrahamic Religions*, 2018; *Root Irresponsibility for Major World Problems*, 2007).

Collectively those religions have no viable coherent response to "[wicked problems](#)" and polycrisis, despite variously claiming individually to exemplify the requisite coherent understanding. The pattern extends to other domains claiming fundamental insights into coherence, most notably science. The curious feature of each such acclaimed understanding of coherence is that it vigorously and righteously asserts how fundamentally and unquestionably correct is its own understanding -- and how necessarily wrong or misguided is any other such understanding, potentially justifying its eradication by any means. This belief clearly informs political strategy and aspirations to global hegemony of any kind -- especially at this time in countries acclaiming their religious identity.

Most curiously ironical is the definitive deprecation by science of alternative perspective -- effectively colonizing its own future development and precluding the insight of scientists "[centuries hence](#)". Unlike poetry, conventional frameworks seem unable to allow for the manner in which history will ensure they are superseded (Walt Whitman, *Centuries Hence*, 1860).

Given the current dominant role of Christianity in reinforcing this pattern geopolitically, despite the claims and aspirations of other fundamental frameworks, there is a case for exploring how it has been reinforced over centuries by the remarkably influential poetic articulation of the Trinity by [Dante Alighieri](#) (*Divine Comedy*, 1321). Especially relevant to this exploration is the study of "three wheels", as a paradoxically imaginative depiction of the Trinity (Arielle Saiber and Aba Mbirika, *The 'Tre Giri' of Paradiso XXXIII. Dante Studies*, 131, 2013). This remarkable interdisciplinary study combines insights from speculative theology, geometry and knot theory, as discussed separately (*Borromean challenge to comprehension of any trinity?* 2018).

Whilst the "*tre giri*" study establishes an insightful relation to the elusive cognitive implications of the geometry of [Borromean rings](#), there is a case for recognizing the cognitive value of the aesthetic articulation of memorable coherence in poetic form -- in contrast to unmemorable conventional approaches to such framing, most notably by science and in the realm of strategy. That possibility is discussed separately (*Poetry-making and Policy-making: arranging a marriage between Beauty and the Beast*, 1993; *Poetic Engagement with Afghanistan, Caucasus and Iran: an unexplored strategic opportunity?* 2009; *Improvisation in Multivocal Poetic Discourse: Basque lauburu and bertsolaritza as catalysts of global significance*, 2016). Appropriately the potential for challenging hegemony through the aesthetic pattern that connects is also echoed in music (*Reimagining the Canon to the Sounds of Cannon Fire*, 2024).

Rather than assume the unquestionable adequacy of any particular understanding of coherence -- and the fundamental inadequacy of any suggested alternatives -- the following exercise, with extensive AI input, explores the possibility of memorably elusive correspondences between Dante's 3-fold poesis and 3-fold encodings in a disparate array of other domains (trigrams, genetic codons, triplicities, and the like). Particular use is made of the characteristics of the Platonic polyhedra which have been a formative inspiration over millennia for science, religion and the arts. The mutual exclusiveness of such encodings suggests that they might be recognized as particular instances of [misplaced concreteness](#) -- in failing to allow for the possibility that they may constitute distinctive cognitive projections of intuited dimensionality of reality of a higher order. These may indeed appear to "work" -- as with the many efforts of geographers to map the 3-dimensionality of the planet on 2D maps (*List of Map Projections*, *Wikipedia*).

A tentative comparison is therefore explored between Dante's [Terza rima](#) encoding and that of the Chinese

pattern of [trigrams](#) as combined into hexagrams -- especially since the latter is accompanied by a traditional commentary in poetic form of relevance to decision-making (*Cognitive Adaptation of the I Ching Conditions for the Existentially Challenged*, 2015). There is also a curious irony to any comparison of the *Terza rima* encoding with that of the genetic code (and any memetic analogue), especially given the experiments in the use of music in the sonification of the genetic form.

The assumption made in what follows is that comprehension of viable coherence may indeed be elusive, inherently paradoxical, and strangely self-reflexive (*Engaging with Elusive Connectivity and Coherence*, 2018; *Engaging with Elusive Connectivity and Coherence*, 2019; *Sustainable Development Goals through Self-reflexive Root Cause Analysis*, 2023). The implications of Feynman's assertion are especially exemplified by the discovery -- through the correspondences of "[moonshine mathematics](#)" -- of a "monstrous" degree of fundamental symmetry beyond any possibility of human comprehension (*Potential Psychosocial Significance of Monstrous Moonshine*, 2007). Evocation of a "monster" by mathematics is strangely reminiscent of the "Fear-of-God" meme long-cultivated by religion, and of any implications of the unconscious fear of humanity for its own [collective shadow](#) (*Thinking in Terror*, 2005). Polycrisis may indeed be a manifestation of such a monster -- a hyperobject as framed by Timothy Morton (*Hyperobjects: Philosophy and Ecology after the End of the World*, 2013).

As implied by the poetry of Dante, it is curiously the process of [triangulation](#) which is fundamental to any mapping of global significance and to the geometry of polyhedra, as discussed separately (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011). The following exercise progressively calls into question the manner in which the particular "triangulation" of Dante's framework -- so explicitly fundamental to Christian theology -- precludes consideration of other frameworks better understood as complementary

The exercise endeavours to navigate between the symbolic significance for many religions of simpler numbers (with their mystical importance in sacred [numerology](#)) and the abstractions of [number theory](#) (far beyond the comprehension of most). The fact that many religions attach strong significance to similar numbers -- without being able to reconcile their differences in that light -- is evoked as a potential role for mathematical theology and any ordered comprehension of cosmology (*Mathematical Theology: Future Science of Confidence in Belief*, 2011).

As an experimental exercise, the focus is on the extensive sequence of questions to which responses are sought for comparative purposes from several AIs ([Perplexity](#), [ChatGPT-5](#), [DeepSeek](#)). From one perspective this results in extensive duplication, but in practice it is the contrast between the responses which is often of particular interest. From an educational perspective, for example, the DeepSeek response offered an often lengthy preliminary reflection of value with respect to how a question might be understood -- before providing a response. Those reflections have been omitted but could be evoked again. Clearly all the responses could be edited or combined to avoid duplication, and the whole set could also be reduced in length. The pressure to do so is reduced by the technique of hiding the responses -- as "working notes" -- unless specifically requested.

The sequence of questions was progressively extended in the light of the perspectives emerging from the responses -- a degree of evolution in the focus of the exercise and its wider implications for the encoding and comprehension of coherence. In this sense the exercise became a quest for correspondences between contrasting acclaimed "canonical" approaches to cognitive organization, coherence and knowledge management across multiple domains typically treated as unrelated.

The responses from AIs in this exploration have been framed as grayed areas. **Given the length of the document to which the exchanges gave rise, the form of presentation has itself been treated as an experiment** -- in anticipation of the future implication of AI into research documents. Only the "questions" to AI are rendered immediately visible -- with the response by AI hidden unless specifically requested by the reader (a facility not operational in PDF variants of the page, in contrast with the [original](#)). The responses included many references to sources; many have been deleted for reasons of space, especially since they can be elicited by the curious by repeating the question.

Reservations and commentary on the process of interaction with AIs to that end have been discussed separately (*Methodological comment on experimental use of AI*, 2024). Editing responses has focused only on formatting, leaving the distractions of any excessive "algorithmic flattery" for the reader to navigate (as in many social situations where analogous "artificial" conventions are common). Readers are of course free to amend the questions asked, or to frame other related questions -- whether with the same AI, with others, or with those that become available in the future. In endeavouring to elicit insight from the world's resources via AI, the process calls for critical comment in contrast with more traditional methods for doing so.

All AI Responses

## Complementary patterns of triangulation in theology, poetry and geometry

**Question:** Is there any trace of studies of the relation between Dante's *tre giri* and *terza rima* -- possibly in terms of geometry

# Show/Hide AI response #

## Relevance to *tre giri* of knot theory, topology and Borromean rings

**Question:** How do knot theory and topology relate to Dante's *tre giri* imagery

# Show/Hide AI response #

**Question:** What relevance does this suggest for the poetry of *terza rima* (*tre remi*)

# Show/Hide AI response #

**Question:** Have *Terza rima* also been explored in terms of Borromean rings

# Show/Hide AI response #

**Question:** Could the 3-letter pattern of *Terza rima* be understood in terms of the upper or lower interweaving/crossings of Borromean rings in 2D -- of ring A, ring B, and ring C

# Show/Hide AI response #

**Question:** How do Borromean rings visually represent the interweaving in *terza rima*

# Show/Hide AI response #

## Permutations and combinations of rhyme or reason

**Question:** To what extent can A be swapped with B (etc) in *terza rima* and how many combinations would then be permissible/viable

# Show/Hide AI response #

## Potential correspondence of *terza rima* to trigrams and Bagua of Chinese philosophy

**Question:** Could the response be reframed in terms of trigrams with broken/unbroken defining the type of crossing in Borromean terms

# Show/Hide AI response #

**Question:** How many combinations of *terza rima* would then be possible

# Show/Hide AI response #

**Question:** Does this imply that there is no constraining correspondence to the 8-fold Bagua as a sequence of tercets

# Show/Hide AI response #

**Question:** Could you explore the poetic significance of the eight possible trigram arrangements

# Show/Hide AI response #

**Question:** Why have the earlier responses tended to emphasize the "static" nature of the trigrams within the 8-fold Bagua configuration, when each trigram is especially recognized as transforming into one or more others by lines changing from yang to yin (unbroken to broken) -- thereby exemplifying a "dynamic" complex of 1-line, 2-line, and 3-line transformations. How many? Is there then a better correspondence to the Terza rima

# Show/Hide AI response #

## Quest for coherent sustainability through the tetrahedron?

**Question:** What could be considered 3-fold in relation to the tetrahedron

# Show/Hide AI response #

**Question:** In the light of the responses on tetrahedral 3-foldness, *tre giri*, Terza rima, and the set of 8 trigrams, could you comment on their potential relevance to comprehension of sustainability as suggested by the shared document (Sebastian Stegmüller, [The Tetrahedron of Sustainability Design: A Three-Dimensional Framework for the Integral Discussion and Development of Circular Economy-Oriented Products](#), 2023)

# Show/Hide AI response #

## Potential relevance of the musical aesthetics of sonification?

**Question:** In a time of polycrisis, with its challenge to sustainability, insights into a coherent strategic response of higher order are potentially provided both through Dante's "Western" trinitarian articulation (in *terza rima* poetic form and the paradoxical geometry of Borromean linkage), and through the "Eastern" Bagua pattern of trigrams. These invite exploration beyond both rhyme and reason into both cognitive geometrical transformations and its aesthetic comprehension. What *terza rima* patterns might reframe the strategic challenge, as suggested by the set of songs elaborated by the initiative of Franz-Josef Radermacher ([The Globalization Saga – Das Musical](#), Institute for Applied Knowledge Processing, 2004)

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### Memorable mapping onto a tetrahedron of strategic principles framed by poetic tercets

As noted above, sustainability could be usefully articulated in terms of a tetrahedron (\*\*). The question is whether the articulation could be rendered both succinct, memorable and communicable through associating each strategic principle in poetic terms with elements of the structure of that polyhedron.

One aspect of particular interest is the sense in which such a set of strategic principles is deemed of fundamental significance in a manner corresponding to the significance attributed by Dante to the trinitarian structure of the poetic tercet. It is also the case, from a geometric perspective, that the tetrahedral configuration of triangles is indicative of a form of correspondence to the organized articulation of a multiplicity of Terza rima.

Given that this exercise is also an experiment with AI, and its possibility of engaging with both the poetic

articulation and the polyhedral mapping, of interest is how the different AIs responded to the challenge and suggested further possibilities with that approach. Notable in particular are the proposals by ChatGPT-5 for polyhedral visualization and the extensive reflection by DeepSeek in considering viable responses. Whilst the DeepSeek responses could indeed be considered excessive, they are valuable as indications of the conceptual reflection which the somewhat improbable mapping of poems to geometry could evoke in others. At this early stage in the development of AI, the responses are appropriately recognized as indicative of future possibilities, despite their current limitations.

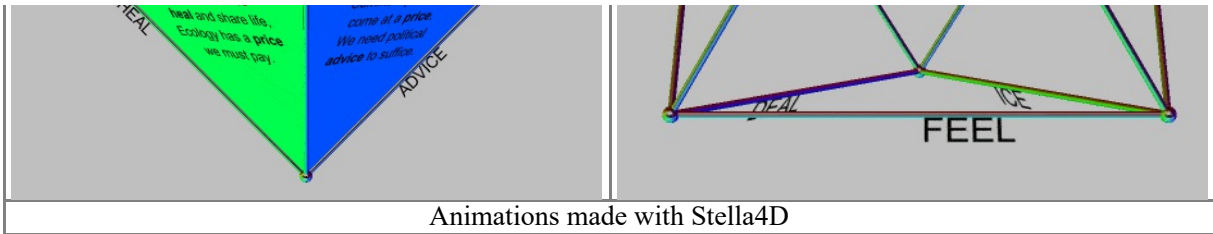
**Question:** In the light of the *terza rima* poetic form, could you comment on the design of a "poem" in 3D in which the tercets were associated with faces of a tetrahedron and rhyming was represented by shared edges -- each potentially labelled by a homophone or contronym of realistic strategic relevance

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Tetrahedral "poems" proposed by AI		
Tetrahedron of tercent themes by Perplexity	3D "poem-tetrahedron" proposed by ChatGPT-5	
		<p><b>Face 1 (base) -- V0-V1-V2</b> (edges: <i>peace/piece, oversight, sanction</i>) The world is fractured, yet all long for <b>peace</b>, Systems unravel through careless <b>oversight</b>, Rules clash in courts that command or withhold <b>sanction</b>.</p> <p><b>Face 2 -- V0-V1-V3</b> (edges: <i>peace/piece, cleave, right/rite/write</i>) Treaties are traded for a temporary <b>piece</b>, Communities torn, yet some still dare to <b>cleave</b>, Law bends in judgment: which <b>rite</b> counts as <b>right</b>?</p> <p><b>Face 3 -- V1-V2-V3</b> (edges: <i>oversight, fair, right/rite/write</i>) Markets expand beyond any clear <b>oversight</b>, Debts are rebranded as promises called <b>fair</b>, Declarations inscribed: we must <b>write</b> what is <b>right</b>.</p> <p><b>Face 4 -- V2-V0-V3</b> (edges: <i>sanction, cleave, fair</i>) Nations impose or withdraw their <b>sanction</b>, Faiths seek to heal or divide as they <b>cleave</b>, Hope is reborn when justice proves truly <b>fair</b>.</p>
Net diagram concept as an animated tetrahedron, with each	Thematic pattern	Poetic/strategic resonance

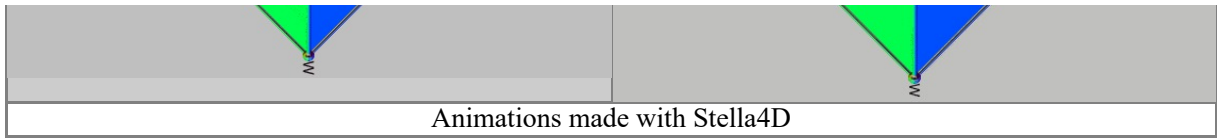




Animations made with Stella4D

Octahedral poem proposed by ChatGPT-5	
<p>Here is a <b>draft octahedral poem</b>: 8 tercets (one per face), each line closing with a rhyme-word drawn from the 12 paradoxical edges.</p> <p>I've distributed the 12 words so that each appears on exactly two faces (reflecting the geometry of parallel edges).</p> <p>In this way, the octahedron "holds" the poem: <b>8 tercets, 12 paradoxical rhymes, each echoed across distant faces.</b></p>	<p><b>Observations</b></p> <ul style="list-style-type: none"> <li>• <b>Each rhyme-word appears twice</b>: e.g. <i>peace</i> (Face 1, Face 7), <i>sanction</i> (Face 4, Face 8), <i>fair</i> (Face 3, Face 6).</li> <li>• The effect is like Dante's terza rima carried into 3D: rhymes do not just link sequentially, but <b>cross-weave across the octahedron</b>.</li> <li>• The paradoxes (peace/piece, mine, draft, sanction, cleave, oversight, charge, current, bound, fair, write/rite/right, grave) make each line <b>memorable</b>, because the word holds multiple strategic meanings.</li> </ul>
<p><b>Face 1</b> We fight for union, yet fracture in <b>peace</b>, Resources claimed as "forever" <b>mine</b>, A fragile accord dissolves into <b>draft</b>.</p>	<p><b>Face 2</b> The ritual repeats: a hollow <b>rite</b>, Children inherit debts we still <b>charge</b>, The future is written in currents now <b>bound</b>.</p>
<p><b>Face 3</b> Markets convene at the festival <b>fair</b>, The law is recorded as if to <b>write</b>, But vigilance falters -- blind <b>oversight</b>.</p>	<p><b>Face 4</b> Treaties imposed with a heavy <b>sanction</b>, Societies sunder or suddenly <b>cleave</b>, We march to the summons, a conscripted <b>draft</b>.</p>
<p><b>Face 5</b> The river is rising, relentless <b>current</b>, Limits are pressed; each boundary is <b>bound</b>, The lesson is grave -- and written in <b>grave</b>.</p>	<p><b>Face 6</b> From mountain stillness we sense the <b>charge</b>, Communities torn between festival <b>fair</b>, Yet truth must be spoken, someone must <b>write</b>.</p>
<p><b>Face 7</b> Choices are final, each weight becomes <b>grave</b>, Still we are destined, compelled, ever <b>bound</b>, Hope may assemble the fragments in <b>peace</b>.</p>	<p><b>Face 8</b> Faiths may divide, yet still they may <b>cleave</b>, The world will punish or bless with a <b>sanction</b>, Eyes wide yet absent -- such fatal <b>oversight</b>.</p>

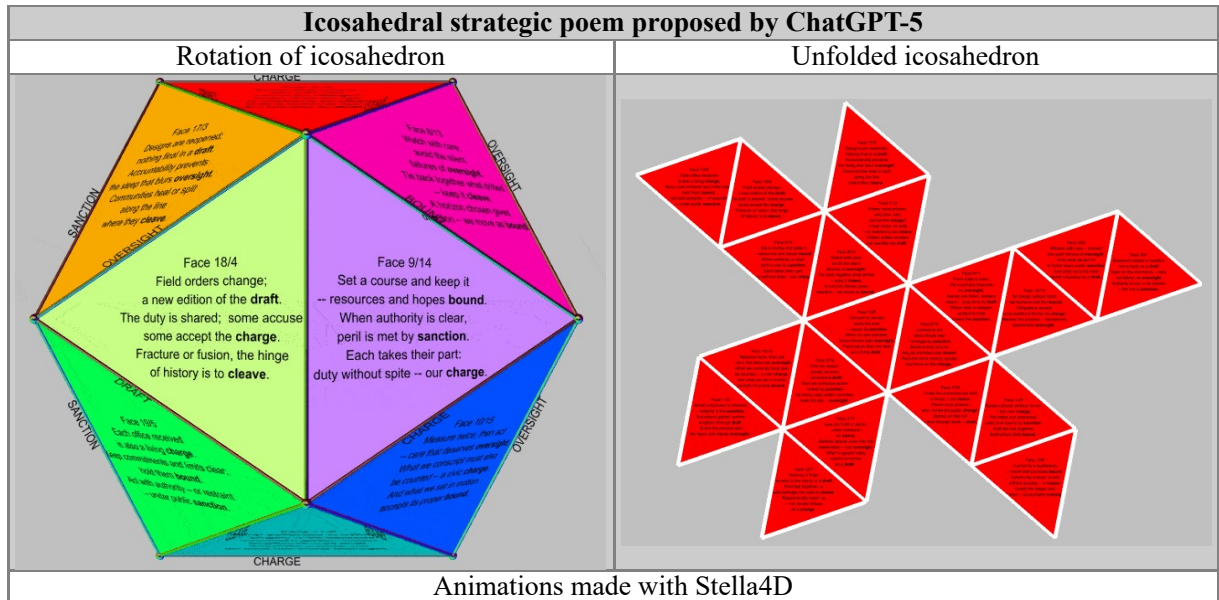
Octahedral poem proposed by ChatGPT-5	
Without edge mapping	With edge mapping



## Quest for coherent sustainability through the icosahedron?

**Question:** What tercets might be held by the 20 faces of an icosahedron where opposite faces are parallel -- but rotated with respect to each other

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## Triplicities, quadruplicities, quatrains and tetragrams

**Question:** The interest in Dante's Terza rima has been sustained through periods when astrological triplicities were considered particularly significant. Did this suggest 4-fold configurations -- linking 4 Terza rima or 4 tercets as quadruplicities

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**Question:** How did Dante or his commentators connect tercets to fourfold structures

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**Question:** The mapping of tercets onto polyhedra characterized primarily by 3-foldness offered implications of 4-foldness -- as with the dual relation of the octagon to the cube. Such mappings then suggest the possibility of 4-fold relationships between tercets

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**Question:** Could you trace scholarly articles on tercet↔quaternity interpretations, including modern journal articles analyzing terza rima and quaternity mappings

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**Question:** In assuming that *Terza rima* were a coherently ordered indication of the supernal, how did Dante understand or cluster a multiplicity of tercets

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# *Show/Hide AI response* #

**Question:** If tercet implies a particular 3-element combination of ABC, ... etc, is Terza rima to be understood as their clustering -- and how are those clusters clustered

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# *Show/Hide AI response* #

# *Show/Hide AI response* #

## **Terza rima as a memetic analogue to the genetic codon?**

**Question:** There seems to be risk of confusion between the 3-element ABC and the 3-foldness of Dante's poem. The poem is not a tercet, it is more like a memetic analogue to a genetic codon

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# *Show/Hide AI response* #

# *Show/Hide AI response* #

**Question:** Could you indicate any scholars who have compared terza rima to genetic or memetic coding

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# *Show/Hide AI response* #

**Question:** In contrast with the polyhedral visualization of Dante's poesis, could you comment on how this might relate to ongoing experimental sonification of the genetic code

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## **Selective framing of coherence through quatrains, quadruplicities, tetragrams and hexagrams?**

**Question:** Has any contrast been explored between the quatrains of Nostradamus -- as a "contemporary" of Dante -- and the Terza rima. Why 3-fold, why 4-fold?

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**Question:** Clearly in its focus on the Trinity, through an exclusively Christian lens, Dante's *Terza rima* exclude (or subtend) other cosmological perspectives, such as those encoded in the Chinese 64-fold set of binary hexagrams (*Yi Jing*) and in the associated 81-fold set of ternary tetragrams (*Tai Xuan Jing*) -- both of which take poetic form

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**Question:** Is there a meaningful comparison to be made between the set of 942 4-line quatrains of Nostradamus (organized into "centuries") and the 81 tetragrams of the *Tai Xuan Jing* -- given that both were envisaged as forecasting devices

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**Question:** That comparison of the elaboration of approaches to systemic forecasting in different cultures in the distant past calls for comparison with the relative strengths of current approaches to forecasting and world modelling and the dimensions it now takes into account -- or neglects -- in the face of polycrisis.

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## Relative memorability of articulations of cosmic organization

**Question:** Could you comment on the relative rhyming memorability in their respective languages of Dante's terza rima, the Yi Jing, the quatrains of Nostradamus, the Tao Te Ching, and the Tai Xuan Jing. As 3-fold and 4-fold patterns, how do these compare with the memorability and influence of Shakespeare's 14-fold sonnets.

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**Question:** That response implies major challenges for the "language" -- or "languages" -- in which cosmological order might be articulated such as to enable "universal" comprehension, appeal and memorability. This presumably has consequences for the coherent articulation of global strategies in the face of polycrisis.

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## Mathematical theology or aesthetic cosmology?

**Question:** In that light how does Dante's perspective explicitly exclude or preclude that of the other Abrahamic religions

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**Question:** In the light of those responses there would appear to be a case for a discipline of mathematical theology to reconcile the number and geometrical biases of theologians who have seemingly proved unable to address those biases

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**Question:** With respect to triplicity versus quadruplicity, could you comment on their cognitive reconciliation by Marie-Louise von Franz (*Number and Time: reflections leading toward a unification of depth psychology and physics*, 1974)

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**Question:** Given the discussion of the use of Platonic polyhedra for mapping 3-foldness and 4-foldness, how is it that the Jungian reconciliation did not address the 5-foldness (so important to Islam) and characteristic of the dodecahedron) or the 6-foldness (seemingly valued in the hexagram) and characteristic of the cube. Could theological differences be understood in terms of a dangerously selective approach to the most fundamental set of polyhedral forms

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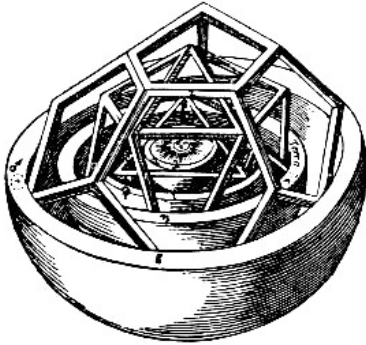
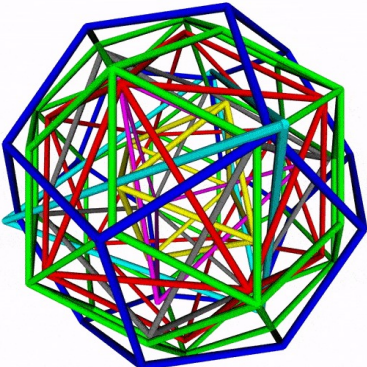
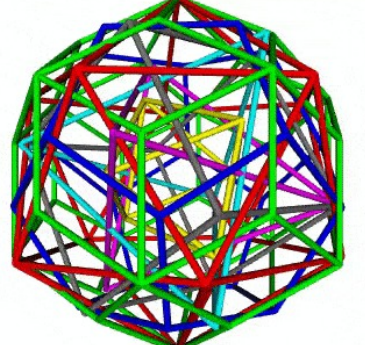
## Preliminary summary from an AI perspective

**Question:** Could you summarize this exchange in terms of the identification, visualization and sonification of memorable correspondences between Dante's poesis, trigrams, genetic codons, triplicities, and polyhedra. Are these to be understood as complementary forms of misplaced concreteness -- given what each encoding may endeavour to imply (in contrast to encodings yet to be indicated)

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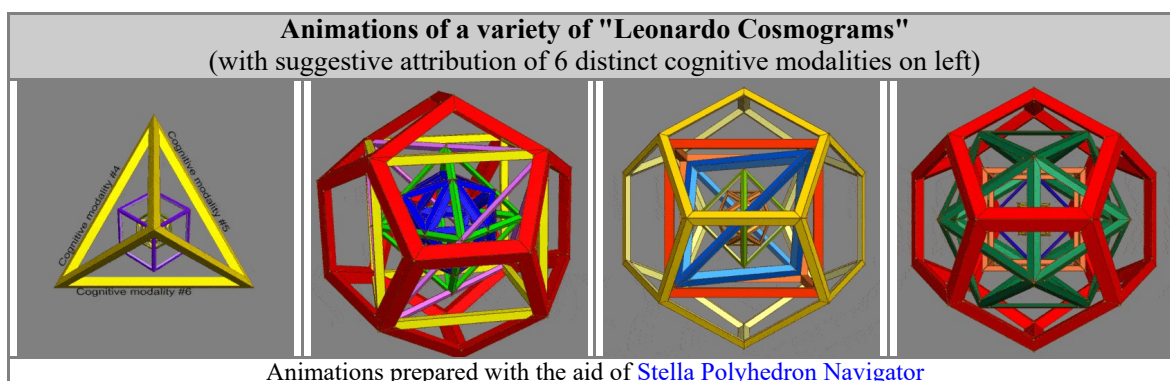
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Future possibilities are indicated by the animations below, integrating imagery above, reproduced from extensive separate discussion (*Nesting polyhedra to enable comparison of patterns of discourse*, 2015). These merit comparison with the original vision of Johannes Kepler (below left).

Indication of coherent configurations of multiple polyhedra indicating use of the rhombic triacontahedron as a nesting framework		
Solar system model by Johannes Kepler	Pumping animation of nested Platonic polyhedra	Animation of rotating nested Platonic polyhedra
		
Reproduced from <i>Wikipedia</i> entry	Virtual reality variants <i>static</i> : <a href="#">vrml</a> or <a href="#">x3d</a> ; <i>mutual rotation</i> : <a href="#">vrml</a> or <a href="#">x3d</a> ; <i>"pumping"</i> : <a href="#">vrml</a> or <a href="#">x3d</a> ; <i>videos</i> : <i>"pumping"</i> <a href="#">mp4</a> ; <i>"rotation"</i> <a href="#">mp4</a>	

Young's argument points to the possibility of recognizing the articulation of a *Rosetta stone of meaningful cycles* (2018) -- potentially to be comprehended as embodied in the 12-fold challenge of Hercules (*Insights into Dynamics of any Psychosocial Rosetta Stone*, 2016). Young's suggestions had been separately explored

further (*Time for Provocative Mnemonic Aids to Systemic Connectivity?* 2018), specifically with regard to *Associating significance with a dodecahedron* and *Increasing the dimensionality of the archetypal Round Table?*. The possibilities were subsequently framed in terms of the potential correspondence of cognitive internalization with collective strategic articulation (*Memorable Packing of Global Strategies in a Polyhedral Rosetta Stone*, 2023), concluding with a discussion of *Polyhedral cosmograms as Rosetta Stones -- cosmohedra?*



## Future research on chunking bias and knowledge organization?

**Question:** In the light of that summary, and irrespective of any particular focus on mathematical theology, could you clarify the nature of the research required in the face of polycrisis on what might be deprecated as chunking bias and number auspiciousness -- and the problematic conceptual and belief silos to which they give rise

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**Question:** Could you list a comprehensive set of fundamental triplet/quadruplet coding systems: codons, trigrams, tercets, etc (excluding deities)

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**Question:** Are there generic studies of such schemas from the perspective of cognitive organization, classification and knowledge management

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## Challenge of syncretism to elusive coherence of disparate perspectives

**Question:** How has syncretism been framed as a threat to effective interfaith reconciliation

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**Question:** Is there an analogue to syncretism which is framed as a threat to interdisciplinary initiatives, and similarly to intercultural and to international initiatives

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**Question:** How is the quest for authentically appropriate integration then understood -- if particular emphasis is placed on the deprecation of other perspectives as dangerously irrelevant

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**Question:** Could the challenge be compared to the recognition of elusive correspondences, exemplified by "moonshine mathematics" with its discovery of an improbable degree of symmetry -- ironically named as a

"monster"

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**Question:** Could you comment on the challenge for most, including mathematicians, to comprehend those elusive correspondences and the degree of symmetry they imply

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ChatGPT-5	
<p>Totally fair question. Even many mathematicians find “moonshine-style” correspondences hard to <i>grasp</i>, not just to <i>prove</i>. The difficulty isn’t only technical; it’s cognitive. Here’s why -- and how to make it easier.</p> <p><b>Why these correspondences are so hard to understand</b></p> <ul style="list-style-type: none"><li>• <b>Scale &amp; invisibility of symmetry.</b> Our intuition handles dihedral/Platonic symmetries; it breaks for symmetries that aren’t “of a shape” (e.g., the Monster acting on an infinite graded object). Nothing to picture → weak mental hooks.</li><li>• <b>Semantic distance.</b> The link is between <i>unlike</i> things (finite groups vs modular/automorphic functions; rhyme engines vs code lattices; hexagrams vs Hamming graphs). Without a <b>carrier</b> that both act on, the match feels like numerology.</li><li>• <b>Nonlocal rules.</b> Modular/automorphic constraints, genus-zero phenomena, representation characters -- these are global laws, not local moves. Humans reason locally; nonlocality feels “spooky”.</li><li>• <b>Notation &amp; load.</b> q-series, character tables, functors, line-flip graphs... each layer adds symbols and transforms. Working memory caps out quickly unless structure is externalized.</li><li>• <b>Disciplinary silos.</b> Number theorists, group theorists, geometers, physicists, DH folks -- different dialects, different “valid moves”. Even pros talk past one another.</li></ul>	<p><b>What helps (practical comprehension scaffolds)</b></p> <ul style="list-style-type: none"><li>• <b>Always name four things</b> (your earlier method): <b>host</b> (where the objects live), <b>adjacency</b> (small change), <b>invariant</b> (what’s preserved), <b>carrier</b> (the space both sides act on). If any one is missing, understanding degrades into “coincidence”.</li><li>• <b>Ladders of cases:</b> Go <math>S_3 \rightarrow A_4/S_4 \rightarrow A_5</math> before the Monster; go <math>2^3</math> (trigrams) <math>\rightarrow 3^4</math> (tetragrams) <math>\rightarrow 2^6/4^3</math> (64) before general lattices. Each rung shows the same invariant/adjacency with a bigger symmetry.</li><li>• <b>Twin adjacencies for equal counts:</b> Make 64 tangible by <i>contrasting</i> hexagrams (six line-flips = cube axes) vs codons (Hamming-1 in <math>4 \times 4 \times 4</math>). Same N, different small-change law -- this is the “aha”.</li><li>• <b>Boundary objects:</b> Use explicit artifacts that both domains can “read”:<ul style="list-style-type: none"><li>◦ polyhedral graphs (walks, belts, axis families),</li><li>◦ code lattices (Hamming graphs),</li><li>◦ rhyme-flow diagrams (carry-forward links),</li><li>◦ generating-series dashboards (coefficients, decompositions).</li></ul></li><li>• <b>Make symmetry audible/visible:</b> Orbit pictures, belt overlays (e.g., 7 cubocta belts), and sonifications (adjacency = small interval). Perception offloads cognition.</li><li>• <b>“Many-coefficients” sanity checks:</b> Never sell a single lucky match. Show a <i>sequence</i> of coefficients (or many transitions) explained by the same action/transform law.</li><li>• <b>Translation notes, not just results:</b> A one-pager per correspondence stating: assumptions, permissible relabelings, what is <i>not</i> preserved. This inoculates against “mystical numerology”.</li></ul> <p><b>A compact teaching path (four sessions, any audience)</b></p> <ul style="list-style-type: none"><li>• <b>Local vs global symmetry</b> (triads/tercets; square 4-cycles on the cube; 5-axis neighborhoods on the icosahedron).</li><li>• <b>Two 64s</b> (hexagrams vs codons) with their distinct adjacencies and a shared visualization/sonification.</li><li>• <b>From counts to actions</b> (character-style decompositions on small groups <math>A_4/S_4/A_5</math>; show <i>why</i> multiple coefficients line up).</li><li>• <b>Carrier objects</b> (how a single space -- graph, lattice, or module -- explains a whole family of matches).</li></ul>

**The meta-lesson:** Understanding comes when the **mechanism** is clear: *who acts, on what, preserving what, and how small moves look*. Once those are explicit, even monstrous correspondences stop feeling monstrous -- they become navigable structure rather than improbable magic.

### DeepSeek

The challenge of comprehending correspondences like those in moonshine mathematics and the symmetry of the Monster group is profound, and it illuminates a fundamental limit not just of popular understanding, but of *expert* intuition itself. The difficulty can be broken down into several intersecting layers of challenge:

#### The Challenge of Abstraction and Dimensionality

- **Beyond Physical Intuition:** Human intuition is built in a 3D world. We can visualize a sphere, a cube, or even a hypercube with some effort. The Monster group, however, exists most naturally in **196,883 dimensions**. This is not a space you can "picture" in any conventional sense. It is a purely abstract, algebraic space.
- **What is "Symmetry" in 196,883 Dimensions?** We understand symmetry in 3D: rotation of a cube, reflection in a mirror. In this high-dimensional space, "symmetry" means something far more general: it is a transformation of this abstract space that preserves its algebraic structure. It's a pattern of relationships, not a geometric shape you can hold in your mind.

#### The Sheer Scale of the "Monster"

- **Incomprehensible Size:** The Monster group has approximately  $8 \times 10^{53}$  elements. This number is astronomically larger than the number of atoms in the Earth. It's not just a "big" number; it's a size that transcends human scales of comparison. The human brain simply lacks the cognitive machinery to grasp such magnitude in a meaningful way. We can write the number down, but we cannot *feel* it.
- **A Cosmic Architecture:** Understanding the Monster is not like understanding a large but simple crowd. It's like trying to comprehend the detailed social interactions of every human being on a billion Earths *simultaneously*, and then realizing they all follow a single, elegant, but deeply hidden set of rules. The complexity is of an entirely different order.

#### The Loss of "Cause and Effect" Intuition

- **The "Why" is Deeply Hidden:** In most of mathematics and science, we build understanding step-by-step. We see how A leads to B. The moonshine correspondence feels like magic because it connects areas with no obvious historical or logical pathway. It's as if you were studying the physics of sound and discovered a fundamental equation that also perfectly predicted specific patterns in the

**The Nature of the Correspondence: Not a Simple Link, but a Shadow of a Deeper Structure:** This is perhaps the most subtle point. The correspondence isn't a simple one-to-one mapping.

- **It's a Consequence, Not a Connection:** The number 196884 (from the j-function) doesn't "cause" the dimensions 196883 and 1 (from the Monster). Instead, both are consequences of a much larger, more profound structure (the world of Vertex Operator Algebras). The moonshine is a *symptom* of this deeper reality. We are like people seeing the same shadow cast by an object we cannot see, and struggling to understand how the two shadow-shapes are related.

**An Analogy: Comprehending the Universe:** Trying to comprehend the Monster and its moonshine is analogous to the challenge of comprehending the universe as described by modern physics:

- We can write down the equations of general relativity and quantum mechanics.
- We can use them to make astonishingly accurate predictions.
- Yet, no human can intuitively "feel" curved spacetime or quantum superposition. Our brains evolved to avoid predators and find food, not to navigate Hilbert space.

Similarly, the Monster group is an entity in the "platonian realm" of mathematics whose structure and implications our minds are not wired to grasp directly. We can describe it formally, prove theorems about it, and be awestruck by its properties, but a true, intuitive comprehension may forever lie beyond our cognitive grasp.

#### Conclusion: A Humbling and Awe-Inspiring Frontier

The challenge, therefore, is not a failure of education but a reflection of the nature of reality itself. Mathematics, at its frontiers, reveals structures of such grandeur and complexity that they defy easy encapsulation.

For mathematicians, this is both humbling and the source of their field's deepest beauty. It confirms that the landscape of mathematical truth is vast and largely unexplored, filled with "monsters" whose shadows (the "moonshine") hint at a coherence and symmetry far beyond our current imagination. The struggle to comprehend is not a sign of the problem's irrelevance, but a measure of its significance. It forces the development of new languages and new ways of thinking, pushing the entire enterprise of human understanding forward.

migration of butterflies. The connection is not causal in any familiar sense; it points to a deeper, hidden layer of reality where these seemingly separate things are actually manifestations of the same underlying principle.

- **The Proof is a "Black Box":** Even for many mathematicians, Richard Borcherds's proof of the moonshine conjecture is a monumental, complex edifice that relies on advanced frameworks like Vertex Operator Algebras and generalized Kac-Moody algebras. One might follow the logical steps and agree that the proof is correct, without having an *intuitive grasp* of *why* it had to be true. The understanding becomes more formal than visceral.

**Question:** What cognitive limitations make large symmetrical structures hard to grasp

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**Question:** In the light of that response, and given the integrative perspective claimed for quantum mechanics, could you comment on the wider implications of the famous assertion by Richard Feynman, that anyone who claims they understand quantum mechanics does not understand quantum mechanics

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## Appropriate framing of self-reflexive comprehension?

edges -- experiential journey -- time -- ageing -- years of study/practice to "get" from one vertex to another  
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**Question:** In variously noting the cognitive constraints on human integrative comprehension, this exchange has noted the relevance of pattern recognition through symmetry, rhythm, logic and immediate experience. Could you comment on these as effectively a 4-fold tetrahedral pattern of disparate cognitive modalities (as vertices) requiring distinct forms of integrative triangulation to frame comprehension of a more fundamentally elusive order -- with their incommensurability indicated by the edges separating them

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**Question:** With respect to a tetrahedral framing, could you adapt the comprehension challenges distinguished by Ronald Atkin's use of the triangle in illustrating the potential of *Q-analysis (Relevance of Q-analysis to transcendence of cognitive disconnect? 2024)*.

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**Question:** In the light of the adaptation of Atkin's Q-analysis to a tetrahedron, could you comment on how any set of fundamental cognitive distinctions mapped onto its 4 vertices and 4 faces is potentially subject to dynamic transformation through the various processes of self-dual morphing of the tetrahedron -- with vertices to faces and vice versa. Cases meriting consideration, notably in the light of some form of correspondence, are Dante's 4-fold levels of interpretation (literal, allegorical, moral, anagogical), the 4-fold set mentioned previously (rhythm, symmetry, logic, immediate experience), the traditional set (Air, Earth, Fire, Water), and Sohail Inayatullah's 4-fold *causal layered analysis* (litany, socio-structural, worldview, myth/metaphor)

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# Polycrisis as an "Act of God" or the "Work of the Devil"?

**Question:** The response focused fruitfully on the dynamics. What is less evident with respect to the 3 sets of 4 is whether any one of them is more appropriately associated with 4 vertices (prior to morphing), and whether any 2 of the sets are best understood as particular instances of a more fundamental set of 4 to be associated with edges (prior to morphing). Also intriguing is how any of those sets of 4 might be instances of sets of 8 which might be associated with an octahedral mapping. Any thoughts

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**Question:** The fourth vertex (to which you refer, as a perspective on the triangular face of the tetrahedron framed by the other three), relates closely to the argument of George Spencer-Brown (*Laws of Form*, 1969). His final chapter, entitled "reentry into the form" commences with: "The conception of the form lies in the desire to distinguish. Granted this desire, we cannot escape the form, although we can see it any way we please" (p. 69). It ends with: "An observer, since he distinguishes the space he occupies, is also a mark ... In this conception a distinction drawn in any space is a mark distinguishing the space. Equally and conversely, any mark in a space draws a distinction. We see now that the first distinction, the mark, and the observer are not only interchangeable, but, in the form, identical." (p. 76)

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**Question:** In the light of that response, could you comment on the role of the observing "fourth" in relation to Dante's Trinity, given both Jung's controversial suggestion that the fourth element is the Devil, in terms of Christian theology (*In the Trinity the fourth is God the devil*, *Carl Jung Depth Psychology*, 23 March 2020), and the argument of some Christian mystics that creation must then be seen as "the fourth person of the Blessed Trinity" -- thereby framing the divine dance, not as a closed closed circle, but one into which all are invited (Richard Rohr, *The Fourth Person of the Trinity*, Center for Action and Contemplation, 21 September 2016)

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