

# GEOMETRY AS A RELATIONAL PHASE:

a critical–propositional analysis of Matthew D. Lehman’s *When Geometry Breaks Down* in confrontation with the axioms, phenomenic elements, Inducer Effects, cosmogonic theorem, and cosmological Eras of the Theory of Objectivity

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## 1. ABSTRACT

This article presents a critical–propositional analysis of Matthew D. Lehman’s *When Geometry Breaks Down: A plain language account of four papers on relational structure, spectral collapse, and what lies beyond*, published on Zenodo in 2026, in confrontation with the Theory of Objectivity of Vidamor Cabannas and Denivaldo Silva. Lehman’s text synthesizes four technical studies on finite weighted graphs, spectral dynamics, the collapse of geometry, and post-geometric phases. Its central thesis is that geometry should not be understood as an absolute given, but as a relational phase that becomes admissible when there is globally coherent propagation, measured by the spectral gap  $\lambda_1$ . When  $\lambda_1 > 0$ , the network supports a geometric description; when  $\lambda_1 \rightarrow 0$ , geometry fails, although the relational structure may persist.

This analysis brings Lehman’s proposal into dialogue with the Theory of Objectivity, especially with its modal axioms, phenomenic elements, Inducer Effects, cosmogonic theorem, and cosmological Eras. It argues that Lehman’s article offers a relevant operational bridge for thinking about the emergence and failure of geometry, but it does not replace the modal cosmogony of the Theory of Objectivity, because it does not explain the origin of elements, the primordial mathematical Nothing, the antagonistic Tempus, the initial perfect sphere, ontological observability, or the substance transcendent to the quantum. In the end, the analyzed article is assigned a high degree of dialogue with the Theory of Objectivity, especially because it treats geometry as a regime derived from relations and recognizes the persistence of post-geometric structures, which may be interpreted, within the TO framework, as informational-relational permanence equivalent to atomic radiations produced in elemental relations.

**Keywords:** Theory of Objectivity; Vidamor Cabannas; Denivaldo Silva; Matthew D. Lehman; emergent geometry; spectral gap; post-geometric phase; phenomenic elements; Inducer Effects; modal cosmology; relational information; atomic radiations.

## 2. INTRODUCTION

Matthew D. Lehman’s article, *When Geometry Breaks Down*, published on Zenodo in 2026, presents a plain-language synthesis of four technical papers on relational structure, spectral dynamics, geometric collapse, and post-geometric phases (Lehman 2026). Its fundamental problem can be formulated directly: under what conditions can a physical, mathematical, or relational system support a geometric description?

This question is not merely technical. It touches one of the deepest foundations of modern physics: the relationship between space, structure, propagation, and existence. Since Einstein, geometry has ceased to be a simple fixed stage for physical events and has

become a dynamic structure of spacetime (Einstein 1920). Yet even in general relativity, geometry remains the privileged language of physical reality. The curvature of spacetime organizes gravitation; fields evolve on a manifold; particles and radiations are described in terms of location, trajectory, causality, and metric.

Lehman shifts the question. Instead of asking what the geometry of the system is, he asks when there is geometry. This change is philosophically decisive. If geometry depends on propagation conditions, then it is not an absolute foundation, but an admissible phase of a relational structure. In other words, geometry may emerge, persist, degrade, collapse, and leave post-geometric residues.

This shift dialogues deeply with the Theory of Objectivity, hereafter TO, especially because TO also does not begin with physical geometry as an ultimate given. In its foundational bibliography, TO presents itself as a third theory of the origin of the universe, an alternative both to the Big Bang theory and to creationism, seeking to ground universal existence in logical-ontological principles endowed with modal necessity (Cabannas and Silva 2016; Cabannas and Silva 2018). TO does not merely aim to describe the universe after it has already formed; it seeks to explain the genesis of the conditions that make it possible for there to be universe, space, time, elements, boundaries, observation, composition, and substance transcendent to the quantum.

For this reason, Lehman's proposal is relevant: it offers a mathematical and operational language for thinking geometry as the result of relations. The article does not confirm TO, nor does it formulate its own cosmogony. But it opens a field of dialogue: if geometry depends on coherent propagation in a relational network, then spatiality may be conceived as a derived phenomenon rather than as a first reality.

The purpose of this analysis is to examine that dialogue. Lehman's article will be confronted with the axioms of TO, considered in their modal necessity; with the phenomenic elements; with the Inducer Effects; with the cosmogonic theorem; and with the cosmological Eras of the Theory of Objectivity. It is assumed, according to TO's internal orientation, that the transcendent element is knowledge or information produced in atomic relations, equivalent to atomic radiations.

### **3. THE PROBLEM OF GEOMETRY IN MATTHEW D. LEHMAN'S ARTICLE**

Lehman's text begins with a question rarely made explicit in physics: what makes space space? This question differs from asking what space is made of, how it curves, or what objects exist in it. It is a more primitive question: under what conditions is a description in terms of location, distance, and neighborhood valid?

To answer this question, Lehman uses the framework of finite weighted graphs. A network is composed of nodes and connections; the connections have weights, that is, relational intensities or strengths. Such networks may represent physical, social, neural, material, or purely abstract systems. The central point is that, in this model, relations are primary. Geometry, if it exists at all, emerges from the relational behavior of the network.

The question then becomes operational: does a network behave geometrically? The answer depends on its capacity for coherent propagation. If signals, information, or influences can traverse the network globally, the system admits a geometric description. If such propagation fails, geometry ceases to be an adequate description.

The mathematical criterion presented is the spectral gap, denoted by  $\lambda_1$ . In simplified terms, the spectral gap measures the capacity of the network for mixing, communication, or global propagation. When  $\lambda_1$  is positive, the network supports coherent diffusion. When  $\lambda_1$  tends toward zero, global propagation ceases to function. Geometry, in that case, collapses.

This point is important because it moves geometry from the category of a given structure to the category of a regime. Geometry ceases to be the starting point and becomes a functional condition. This displacement brings Lehman close to contemporary discussions on the emergence of spacetime, information, networks, emergent gravity, and pre-geometric structures, even though the article itself remains cautious and does not claim to have derived a complete physical theory of spacetime.

#### 4. GEOMETRY AS AN ADMISSIBLE REGIME OF PROPAGATION

The notion of geometry as an admissible regime is perhaps the article's most relevant contribution. Lehman proposes that geometry exists, in an operational sense, when the network allows globally coherent propagation. This thesis may be read as a methodological inversion: one does not begin with a space and then place relations within it; one begins with relations and verifies whether something describable as space emerges from them.

This inversion dialogues with a long critical tradition against naive substantialist conceptions of space. Einstein showed that space and time are not absolute independent containers, but magnitudes articulated with the physical structure of the universe (Einstein 1920). Bohm, by another path, proposed that manifest reality may derive from a deeper implicate order, in which ordinary spatial separation is not the ultimate level of the real (Bohm 1980). Penrose, in turn, emphasized the mathematical depth of physical structures, without reducing sensible reality to immediate appearance (Penrose 2004).

TO radicalizes this intuition by holding that the universe must be explained from principles prior to physical geometry. The Seven Absolute Truths of TO function as modal bases for the genesis of the universe. In this context, geometry is posterior to the logic of existence, the distinction between elements, boundaries, observation, composition, and the substance transcendent to the quantum.

Lehman's article does not explicitly share this ontology. Nevertheless, its conception of geometry as a relational phase provides a bridge. In TO language, one might say that a network becomes geometrically phenomenizable only when the relations among its elements reach a minimum condition of propagation. The positive spectral gap, in this case, would be an operational measure of geometric admissibility.

However, TO cannot be reduced to the spectral gap. The gap is a criterion internal to a class of mathematical models. TO seeks a broader ontological foundation. Thus, Lehman's proposal should be received as an instrument of dialogue and partial formalization, not as a substitute for TO's cosmogonic theorem.

## **5. TOPOLOGICAL CONNECTIVITY, FUNCTIONAL CONNECTIVITY, AND ONTOLOGICAL BOUNDARY**

One of the most fertile distinctions in the article is the difference between topological connectivity and functional connectivity. A network may remain connected in the topological sense, that is, there may be a path between any two nodes, and yet it may lose its capacity for coherent propagation. Lehman's example is that of two dense clusters connected by a weak bridge. The bridge exists; the network has not broken apart. However, as this bridge weakens, the spectral gap tends toward zero. Functional communication between the clusters becomes practically unviable.

This distinction is extremely relevant to TO. The Fourth Absolute Truth states that two distinct elements require at least one boundary line between them. Boundary, in this context, should not be understood only as a geometric line. It may be a functional, relational, modal, or phenomenic difference. Lehman's article offers an operational language for this difference: a boundary may arise when propagation between domains ceases to be functionally efficient, even though formal connection remains.

Thus, the weak bridge between clusters may be interpreted as a spectral boundary. It separates regions not because there is no path, but because the path no longer sustains effective communication. In TO language, there is formal relation without full functional observability.

This reading also allows for a deeper understanding of the Fifth Absolute Truth of TO: an element exists fully only if observed by at least two others. Observation, in TO, is

not necessarily psychological observation. It is a relational condition of full existence. An element exists fully when it is integrated into a minimal network of recognition, differentiation, and information. Lehman’s network, when it loses global propagation, shows that the mere structural presence of connection is not enough to guarantee effective integration.

Therefore, the distinction between topology and functionality can enrich TO. It suggests that the full existence of elements depends not only on the presence of relations, but on the relational power of those relations. Where relation loses propagation, boundaries, isolations, asymmetries, and post-geometric regimes emerge.

## 6. SPECTRAL COLLAPSE AS AN OPERATIONAL LANGUAGE OF GEOMETRIC FAILURE

Lehman describes two main modes of geometric failure: global degradation and localized overload. Both lead to the limit  $\lambda_1 \rightarrow 0$ , but through different trajectories.

In global degradation, the weights of the network weaken uniformly. Propagation becomes increasingly slow, until it loses the capacity to sustain geometry. The network remains connected, but its functional strength dissipates. This collapse is smooth, gradual, diffuse, and analytically tractable.

In localized overload, certain nodes or regions accumulate stress. This stress suppresses nearby connections, and the modes of propagation collapse into a reduced area. The failure is rapid, concentrated, and strongly localized. The network remains connected, but its global capacity is captured by a saturated region.

The distinction is important because it shows that geometric collapse is not a homogeneous event. There are different histories of failure. Each trajectory leaves a structural signature. Two networks may reach the condition of geometric failure, but one may arrive there through diffuse depletion, while the other arrives through localized saturation.

In TO language, this suggests different modalities of Inducer Effects. Global degradation may be interpreted as a reducing or dissipative inducer effect. Localized overload may be interpreted as a saturating or concentrating inducer effect. The reinforcement described in Lehman’s third study may be interpreted as a restorative inducer effect, capable of recovering geometric admissibility if its intensity overcomes degradation.

This articulation is propositional. Lehman’s article does not speak of Inducer Effects. But its mathematics may be appropriated by TO as an auxiliary language for describing modes of transition between phenomenic regimes. In particular, spectral collapse may serve as a formal analogy for the loss of geometricity in relational structures.



## **7. THE POST-GEOMETRIC PHASE AND THE PERSISTENCE OF RELATIONAL STRUCTURE**

The fourth moment of Lehman's article is the one closest to the ontology of TO. After the failure of geometry, what remains? Lehman's answer is clear: not nothing. The relational structure remains. The weights continue to encode information. What is lost is the capacity to represent this structure as coherent geometry.

This point is decisive. The post-geometric phase is not absolute absence. It is the permanence of structure without adequate spatial representation. Lehman distinguishes two forms: PGPS-D, of the diffuse type, resulting from global degradation; and PGPS-S, of the saturated type, resulting from localized overload. The first preserves spread-out modes, although weak ones; the second concentrates almost all propagation in a localized region.

TO finds here a very fertile field of dialogue. The Seventh Absolute Truth states that there is no existential universe without substance transcendent to its quantum. In the reading adopted in this analysis, this transcendent substance is knowledge or information produced in atomic relations, equivalent to atomic radiations. Therefore, the persistence of relational structure after the failure of geometry may be interpreted as a formal indication that there is information beyond spatialization.

In other words, when geometry fails, relational information is not necessarily extinguished. Geometry is only one form of presentation of relation. Information may persist in another regime. This thesis is highly compatible with TO, provided that it is read as a formal analogy and not as direct empirical confirmation.

Lehman's post-geometric phase may therefore be considered an operational bridge to TO's idea of informational transcendence. What transcends the quantum is not a mystical entity or something external to reality, but relational knowledge produced within the elements themselves, equivalent to atomic radiations. Geometry may collapse; relational information may remain.

## **8. THE THEORY OF OBJECTIVITY AND THE MODAL NECESSITY OF THE AXIOMS**

TO distinguishes itself from merely operational models because it claims an axiomatic structure of modal necessity. Its Seven Absolute Truths are not presented as ordinary empirical hypotheses, but as fundamental propositions necessary for there to be universe, elements, boundaries, composition, observation, and transcendence.

The Seven Absolute Truths of TO may be summarized as follows:

1. Nothingness is a primitive and eternal mathematical essence.
2. Every element has a magnetic field, or aura, that makes it unique.
3. The infinite represents the necessary non-element for the logical definition of the universe.
4. Two distinct elements require at least one boundary line between them.
5. An element exists fully only if observed by at least two others.
6. Every element is composed of elements prior to it.
7. There is no existential universe without substance transcendent to its quantum.

These propositions have a function distinct from Lehman's formal criteria. While Lehman defines geometric admissibility in terms of a positive spectral gap, TO seeks the logical-ontological condition of possibility of every existential universe. The difference is one of level. Lehman works at the level of finite relational models; TO works at the level of the modal genesis of reality.

However, this difference does not prevent dialogue. On the contrary, it allows a productive articulation. Lehman's article may be read as an operational model of a specific stage: the passage from a relational structure to an admissible geometry. TO, in turn, may provide the broader ontological framework within which this passage acquires cosmogonic meaning.

The modal necessity of TO's axioms prevents the spectral gap from being treated as an ultimate foundation. The gap may measure a propagation condition; it does not by itself explain why there are elements, relations, boundaries, observers, and informational transcendence. In this sense, TO preserves ontological priority over any operational formalism.

## **9. COMPATIBILITIES BETWEEN LEHMAN AND THE SEVEN ABSOLUTE TRUTHS OF TO**

### **9.1. Nothingness as a Primitive and Eternal Mathematical Essence**

Lehman's article does not begin with Nothingness. It begins with networks that are already constituted. Therefore, it does not offer a theory of absolute origin. However, by admitting non-geometric and post-geometric phases, the article contributes to undoing the identification between existence and geometry. This is compatible with TO, since TO affirms that the origin of the universe must be thought before ordinary physical geometry.

The Nothingness of TO is not mere vulgar non-existence. It is a primitive and eternal mathematical essence, a logical condition from which differentiation may be thought. Lehman does not reach this level, but his notion of structure without geometry allows one to understand that the non-geometric is not equivalent to absolute nothingness.

## **9.2. The Magnetic Field or Aura of the Element**

In Lehman, nodes have distinct functions according to their connections, weights, and participation in spectral modes. In TO, every element possesses an aura that makes it unique. The compatibility lies in relational singularization. A node is not simply an indifferent point; its functional identity depends on its position and relations.

The tension is that Lehman does not attribute an ontological aura to the node. TO could propose that the weights and modes of the network are simplified representations of deeper fields of individuation.

## **9.3. The Infinite as Non-Element**

The article works with finitude. However, the collapse of the spectral gap may produce propagation times that grow without bound. This functional asymptote allows an approximation to the role of the infinite in TO: the infinite operates as the necessary non-element for defining the limits and intelligibility of the universe.

The compatibility is indirect. Lehman does not formulate a metaphysics of the infinite, but works with mathematical limits that indicate the loss of geometric function.

## **9.4. Boundary Between Distinct Elements**

The distinction between formal and functional connectivity is one of the article's greatest contributions to TO. Boundary need not be a total rupture; it may be a functional decrease in propagation. Two clusters connected by a weak bridge may be formally connected and functionally separated.

This point strengthens the TO reading that boundary is a condition for the differentiation of elements.

## **9.5. Observation by at Least Two Others**

Lehman does not address ontological observation. However, coherent propagation may be read as a condition of relational recognition. An element that does not participate in global propagation loses geometric integration. In TO, full existence depends on

observation by at least two others, that is, on minimal relational integration.

The compatibility here is strong, provided that one recognizes that “observation” in TO is broader than signal reception.

## **9.6. Composition by Prior Elements**

Geometry in Lehman is composed of prior relations. It is not primitive. This directly dialogues with the sixth truth of TO. Geometry is a composite element, resulting from more basic elements: nodes, weights, connections, modes, and propagation.

TO may interpret this point as a partial formal confirmation of the idea that every higher element derives from prior elements.

## **9.7. Substance Transcendent to the Quantum**

The post-geometric phase is the greatest approximation to the seventh truth. Structure remains even when geometry fails. This permanence may be read, in TO terms, as the persistence of relational information. If the information produced in atomic relations is equivalent to atomic radiations, then Lehman’s post-geometry may be reinterpreted as a formal field of informational transcendence.

# **10. POINTS OF TENSION BETWEEN THE ANALYZED ARTICLE AND TO**

Despite the strong compatibilities, there are important tensions.

The first is the absence of cosmogony. Lehman does not explain the origin of the universe, space, time, or elements. His network is presupposed. TO, on the contrary, seeks to explain the genesis of the universe from the primordial mathematical Nothing, passing through the antagonistic Tempus, the initial perfect sphere, the logical tracks, and the other cosmological Eras.

The second tension is the difference between modal necessity and operational definition. Lehman’s criterion is operational: geometry is admissible when there is a positive spectral gap. TO claims modal necessity: its axioms are logical conditions necessary for universal existence. The spectral gap may be useful, but it does not possess the same ontological status.

The third tension is the absence of a theory of the transcendent element. Lehman speaks of persistent relational structure, but does not identify it with knowledge, atomic information, or radiation. TO proposes this identification as an ontological principle.

The fourth tension is scale. The article works with finite weighted graphs. TO intends to speak of the universe as a totality. Any transposition of Lehman's model to cosmology must be made cautiously.

The fifth tension is the absence of a theory of observation. TO regards observation as a condition of full existence. Lehman considers propagation, diffusion, and spectral modes. There is approximation, but not equivalence.

## 11. PHENOMENIC ELEMENTS, RELATIONAL INFORMATION, AND ATOMIC RADIATIONS

In TO, phenomenic elements represent the modes through which existence manifests itself in objective relations. Lehman's article allows us to identify at least three relevant phenomenic forms: the pre-geometric, the geometric, and the post-geometric.

The pre-geometric corresponds to the relational network prior to spatial description. It is the domain of nodes, weights, and connections before their interpretation as space.

The geometric corresponds to the regime in which the system has coherent propagation and a positive spectral gap. In this regime, distances, neighborhoods, and location become adequate descriptions.

The post-geometric corresponds to the regime in which the structure continues to exist but no longer sustains geometry. This phase is particularly important for TO because it shows that the failure of geometry does not imply the destruction of information.

If one considers that, in TO, the transcendent element is knowledge or information produced in atomic relations, equivalent to atomic radiations, then a deeper reading becomes possible: geometricity is only one of the phenomenic forms of relational information. When geometry collapses, information does not disappear. It may remain in a non-spatial, non-metric, or operator-like regime.

This approximation is relevant to dialogue with quantum physics. Lehman suggests that post-geometric structures may appear closer to operators and constraints than to coordinates and distances. Quantum mechanics, since Heisenberg, broke with the classical intuition of defined trajectory and placed observables, operators, and uncertainty relations at the center of physics (Heisenberg 1958). TO may interpret this convergence as a sign that the real possesses informational layers that are not exhausted by classical geometry.

## **12. INDUCER EFFECTS AND MECHANISMS OF DEGRADATION, SATURATION, AND RESTORATION**

The Inducer Effects of TO can dialogue with the dynamic mechanisms presented by Lehman. Although the article does not use this terminology, its two forms of collapse and its recovery mechanism may be reinterpreted within the vocabulary of TO.

The mechanism of global degradation corresponds to a uniform loss of relational intensity. All weights weaken, propagation becomes slow, and geometry gradually dissolves. In TO terms, this process may be called a reducing inducer effect. It reduces relational power without necessarily breaking the structure.

The mechanism of localized overload corresponds to the concentration of stress in certain regions. Propagation ceases to be distributed and becomes almost entirely localized in a small domain. In TO language, one may speak of a saturating or concentrating inducer effect. The system does not disintegrate, but loses its global form of geometricity.

The reinforcement mechanism, in turn, allows the recovery of geometry when the strengthening of weights overcomes degradation. In TO terms, this process may be interpreted as a restorative or expansive inducer effect. It recomposes the minimum functional condition necessary for geometry to become admissible again.

This reading may enrich TO in two senses. First, it offers a possible formalization for different regimes of relational intensity. Second, it shows that geometry may be recoverable in certain scenarios, but not in all. Lehman observes that recovery from the localized-overload mode remains more difficult, because it requires not only strengthening connections, but also delocalizing modes of propagation.

This difficulty dialogues with TO because it suggests that the restoration of a phenomenic regime requires more than added energy. It requires reorganization of the relational form.

## **13. THE COSMOGONIC THEOREM OF TO BEFORE THE EMERGENCE OF GEOMETRY**

The cosmogonic theorem of TO seeks to explain the genesis of the universe from the Seven Absolute Truths. This explanation includes the passage from Nothingness as a primitive mathematical essence to the antagonistic Tempus, the formation of the initial perfect sphere, the emergence of logical tracks, the constitution of logical currents, the emergence of universal spatiality, and the progressive formation of units of intelligence.

Lehman's article does not reach this level. It does not explain the origin of being, but the admissibility of geometry in already constituted networks. However, its contribu-

tion may be incorporated as an operational bridge at a specific point of the cosmogonic theorem: the passage from pre-geometric relations to functional geometry.

In TO, universal space should not be treated as something simply given. It emerges as the effect of a logical-modal process. The Expansive Inducer Effect, by creating universal space and initiating the counting of time at the end of the Antagonistic Era, cannot be reduced to ordinary physical expansion. It is an ontological opening of spatiality.

Lehman may contribute here by showing that a relational structure becomes geometrically valid only when there is coherent propagation. Thus, within TO, one could propose that the emergence of universal space requires a condition of relational admissibility: elements and boundaries must reach a regime in which informational propagation allows geometricity.

However, the cosmogonic theorem of TO remains broader. It does not depend on finite weighted graphs, although it may dialogue with them. Lehman's model may be a technical analogy, a mathematical bridge, an operational instrument. It is not the modal foundation of cosmogony.

## **14. THE COSMOLOGICAL ERAS OF TO AND THE RELATIONAL READING OF GEOMETRY**

### **14.1. The Antagonistic Era**

In the Antagonistic Era, TO thinks the condition prior to full spatiality. The antagonistic Tempus represent an originary logic of opposition, tension, and possibility. Lehman's article does not address this stage. However, by recognizing the existence of non-geometric structures, it allows one to understand that the non-geometric should not be confused with the non-existent.

Lehman's post-geometric phase is posterior to collapse. The Antagonistic Era of TO is prior to originary geometry. The analogy is therefore limited. Nevertheless, both show that geometry is not the only possible form of structure.

### **14.2. The Era of Logical Tracks**

The Era of Logical Tracks finds strong correspondence with networks and relational paths. In Lehman, weighted links determine the possibility of propagation. In TO, logical tracks guide the passage from relation to universal structure.

The distinction between formal track and functional track may be enriched by the analyzed article. A track exists fully when it allows effective propagation. Otherwise, it

is only topological connection without geometric power.

### **14.3. The Era of Logical Currents of Tertiary Plasma**

The logical currents of tertiary plasma may be thought as relational flows that consolidate the passage between logical structure and physical manifestation. Lehman's article contributes by showing that modes of propagation may remain distributed or collapse locally. This difference may be used to think diffuse currents, saturated currents, and restored currents.

### **14.4. The Centrifugal Era**

The Centrifugal Era involves expansion, differentiation, and formation of spatiality. Although Lehman does not discuss cosmological expansion, his notion of geometric admissibility may help TO think the functional condition of expansion: for expansion to be universe, and not dispersion without form, there must be a relational structure capable of sustaining geometricity.

Here, the spectral gap may be taken as a formal metaphor for the minimum cohesion of expansion.

### **14.5. The Era of Units of Intelligence**

The Era of Units of Intelligence involves memory, thought, observation, and the production of knowledge in atomic relations. Lehman's post-geometric phase, by preserving information without geometry, offers a powerful analogy. It suggests that information may persist in non-spatial form, opening room for a reading in which intelligence, knowledge, and atomic radiation do not depend exclusively on ordinary geometry.

## **15. ARTICULATION WITH THE FOUNDATIONAL, RECENT, AND SUPPORTING BIBLIOGRAPHY**

The foundational bibliography of TO establishes the horizon of this analysis. In *Teoria da Objetividade: terceira teoria de origem do universo, alternativa à Teoria do Big Bang e ao Criacionismo*, Cabannas and Silva present TO as an attempt to ground the origin of the universe on its own logical-ontological bases (Cabannas and Silva 2016). In the 2018 English version, the theory broadens its international reach and presents itself as a cosmological and ontological alternative (Cabannas and Silva 2018). In *A Esfera Perfeita*, TO develops a geometric and modal language for thinking the originary form of totality (Cabannas and Silva 2020).



Lehman’s article dialogues especially with this third dimension: geometry is not merely form, but a condition of manifestation. The initial perfect sphere, in TO, should not be confused with ordinary metric geometry; it is a logical-modal language of totalization. Lehman’s geometry, in turn, is an operational regime of propagation. The relationship between the two is one of analogy, not identity.

The recent bibliography of TO reinforces the need to build bridges between modal axioms and operational contact with contemporary science. Works such as *From Modal Axioms to Empirical Contact* and *Modal Ontology and Testability* indicate precisely the importance of creating mediations between the logical structure of TO and current formal models (Cabannas and Silva 2026a; Cabannas and Silva 2026b). Lehman’s article is one of these possible points of mediation.

In the supporting bibliography, Einstein provides the basis for the geometrization of spacetime; Heisenberg points to the quantum rupture of classical geometric intuition; Bohm suggests an order deeper than spatial appearance; Prigogine and Stengers show the emergence of order in systems far from equilibrium; Kuhn reminds us that deep scientific changes require conceptual reorganization (Einstein 1920; Heisenberg 1958; Bohm 1980; Prigogine and Stengers 1984; Kuhn 1962).

Lehman is situated within this horizon as an author who asks not merely what geometry describes the system, but when geometry is possible. TO, in turn, asks why there is system, relation, boundary, observation, and transcendence. The dialogue is therefore complementary: Lehman offers an operational criterion; TO offers a modal-ontological horizon.

## 16. EPISTEMOLOGICAL LIMITS OF THE ANALYZED ARTICLE

Lehman’s own article is careful about its limits. It does not claim to have derived physical spacetime, solved quantum gravity, or explained the origin of the universe. Its structure applies within finite weighted graphs and an operational definition of geometry.

This caution is positive. It prevents overinterpretation. For TO, however, the limit is clear: the article cannot be treated as confirmation of objective cosmogony. It offers a language of approximation.

Moreover, the analyzed article is a plain-language presentation of four technical papers. It mentions theorems, simulations, and formal definitions, but it does not present within the text itself an empirical demonstration that could be taken as confirmation of TO. Therefore, it is not justified to create a specific section on empirical corroboration. The article’s value is conceptual, formal, and propositional.

Another limit lies in the absence of an explicit ontology of information. Lehman

recognizes that relational weights preserve structural content, but does not formulate a theory of information as transcendent substance. This interpretation belongs to the TO reading.

Finally, there is the limit of cosmological scale. Finite networks are useful models, but the passage to the universe as a totality requires additional mediations. TO may use Lehman as a bridge, but not as a sole foundation.

## **17. CRITICAL-PROPOSITIONAL SYNTHESIS**

The main contribution of Lehman's article to TO is to show that geometry may be understood as a relational phase. This confirms, at an operational level, a central intuition of TO: space is not an absolute foundation, but a manifestation derived from deeper relations.

The distinction between topological and functional connectivity strengthens TO's notion of boundary. The existence of a connection is not enough; there must be propagation, observability, and integration. Boundary may arise even without structural rupture.

Spectral collapse offers a language for thinking the failure of geometricity. Global degradation and localized overload may be reinterpreted as distinct Inducer Effects. Recovery through reinforcement suggests the possibility of restoring phenomenic regimes.

The post-geometric phase is the point of greatest affinity. It shows that structure persists beyond geometry. In TO terms, this persistence may be understood as transcendent relational information, equivalent to atomic radiations produced in elemental relations.

At the same time, TO must preserve its specificity. Lehman's article does not explain the origin of the universe, does not work with absolute modal necessity, does not incorporate the antagonistic Tempus, does not develop the initial perfect sphere, does not thematize the substance transcendent to the quantum, and does not formulate a theory of phenomenic elements. Its contribution is an operational bridge, not a substitution for TO.

## **18. SCALE OF DIALOGUE WITH THE THEORY OF OBJECTIVITY**

The proposed score for the dialogue between Matthew D. Lehman's article and the Theory of Objectivity is:

**8.4 / 10**

The score is high because the article dialogues strongly with central themes of TO: emergent geometry, the primacy of relations, the failure of spatiality, the post-geometric persistence of structure, the difference between formal and functional connection, and the possibility of formalizing conditions of geometric admissibility.

The score is not higher because the article remains restricted to finite weighted graphs, does not present a cosmogony, does not work with axioms of modal necessity, does not identify information with atomic radiations, and does not formulate a theory of the origin of universal space. Even so, as a bridge between TO and contemporary models of geometric emergence, the article is highly relevant.

## 19. CONCLUSION

Matthew D. Lehman's *When Geometry Breaks Down* is an article of great interest to the Theory of Objectivity because it displaces geometry from its traditional position as a given stage to the condition of an emergent phase of a relational structure. Geometry comes to depend on coherent propagation, measured by the spectral gap. When this propagation fails, the system may remain structurally existent, but lose its geometric representation.

This thesis is highly compatible with TO, provided that it is interpreted at its proper level. TO does not merely affirm that geometry emerges; it seeks to explain why there are elements, boundaries, relations, observation, and informational transcendence. Lehman offers a tool for thinking the emergence and failure of geometry, but he does not replace the modal ontology of TO.

The analyzed article allows TO to broaden its operational language. The spectral gap may be seen as a formal measure of geometric admissibility; functional connectivity may enrich the theory of boundaries; the post-geometric phase may dialogue with the substance transcendent to the quantum; and the mechanisms of degradation, saturation, and reinforcement may be approximated to the Inducer Effects.

The general conclusion is that Lehman offers a relevant bridge between contemporary relational mathematics and the modal cosmology of TO. Geometry, in both horizons, ceases to be absolute. It becomes manifestation, phase, derived condition. What remains, for TO, is the need to explain the deeper structure that makes any geometry possible: the primordial mathematical Nothing, the antagonistic Tempus, the elements, the boundaries, the observations, the compositions, and the transcendent information produced in atomic relations.

## 20. APPENDIX IN TO STYLE

### 20.1. Appendix A — Objective Proposition on Geometry

Geometry is not the first being of the universe.

Geometry is the mode by which certain relations reach observable form.

Before geometry, there is distinction.

Before distinction, there is mathematical possibility.

Before manifested possibility, there is Nothingness as primitive and eternal essence.

When elements relate, they produce boundaries.

When boundaries stabilize, they produce tracks.

When tracks conduct propagation, they produce geometricity.

When propagation weakens, geometry withdraws.

When geometry withdraws, information does not disappear.

Information remains as relational transcendence of the quantum.

Thus, the collapse of geometry is not the collapse of existence.

It is only the loss of one form of presentation of existence.

The element remains where its information still radiates.

The boundary remains where difference still operates.

Observation remains where relation still produces knowledge.

The post-geometric phase is, therefore, a possible language for what TO recognizes as the informational persistence of the real.

It is not absolute Nothingness.

It is not the end of relation.

It is not the silence of existence.

It is structure when it can no longer be seen as space.

### 20.2. Appendix B — Propositional Formulation

If a relational network sustains coherent propagation, then its geometry is admissible.

If coherent propagation fails, geometry ceases to be a sufficient form.

If structure remains after the failure of geometry, then there is information not reducible to geometry.

If there is information not reducible to geometry, then spatiality is not the ultimate foundation of the real.

If spatiality is not the ultimate foundation, then cosmogony must seek principles prior to space.

TO identifies these principles in the Seven Absolute Truths.

### **20.3. Appendix C — Synthesis in TO Terms**

Lehman's article shows that a structure may remain connected and yet lose geometry.

TO affirms that an element may exist formally and yet only fully exist through relation, boundary, observation, and transcendence.

The encounter between these two affirmations opens a bridge: geometry is the functional form of a sufficiently propagative relation; full existence is the ontological form of a sufficiently observed relation.

Where Lehman speaks of spectral gap, TO may speak of the minimum condition of phenomenic propagation.

Where Lehman speaks of post-geometric phase, TO may speak of transcendent informational permanence.

Where Lehman speaks of relational network, TO may speak of composition by prior elements.

Where Lehman speaks of functional failure, TO may speak of emergent boundary.

Where Lehman speaks of recovery, TO may speak of restorative Inducer Effect.

Thus, the analyzed article does not replace TO.

But it dialogues with it expressively.

It provides an operational language for thinking an essential thesis:

space is not the first principle;

relation precedes geometry;

information exceeds spatial form;

and the universe can only be understood when geometry is led back to its objective origin.

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