

# ENERGY-FLOW COSMOLOGY AND THE MODAL DISCIPLINE OF OBJECTIVITY:

a critical–propositional analysis of Morten  
Magnusson’s thermodynamic cosmology in  
confrontation with the Theory of Objectivity

Vidamor Cabannas and Denivaldo Silva

**Authors’ note:** This analytical text received analytical support from ChatGPT.

Feira de Santana - Bahia

2026

# Contents

Abstract	3
1 Introduction	4
2 The analyzed article and its conceptual architecture	4
3 Energy-Flow Cosmology as an alternative thermodynamic cosmology	6
4 The Theory of Objectivity and the modal discipline of the axioms	7
5 General compatibilities between EFC v2.1 and TO	7
6 Points of tension between EFC v2.1 and the axioms of TO	8
7 Energy, entropy, boundary, and field: a phenomenic reading	9
8 Information, cognition, and the element transcendent to the quantum	10
9 EFC v2.1 before the Inducer Effects of TO	11
10 The cosmogonic theorem of TO and the critical reading of cosmic origin	12
11 The cosmological Eras of TO and the three domains of EFC	12
12 Dark matter, CMB, and the speed of light: tensions with standard cosmology	13
13 Testability, operational bridges, and epistemological prudence	14
14 Propositional contributions of TO to Magnusson's model	15
15 Position of the analyzed article on the scale of dialogue with TO	15
16 Final considerations	16
A Appendix in TO style	18

A.1	Critical–propositional statement in the language of the Theory of Objectivity	18
A.2	Proposal for a modal translation of EFC . . . . .	18
A.3	Evaluative synthesis in TO style . . . . .	19
<b>References</b>		<b>20</b>

# Abstract

This article presents a critical–propositional analysis of Morten Magnusson’s text, *Energy-Flow Cosmology (EFC v2.1): Modular Synthesis across Structure, Dynamics, and Cognition*, published in 2025, in confrontation with the Theory of Objectivity — TO — by Vidamor Cabannas and Denivaldo Silva. Energy-Flow Cosmology — EFC v2.1 — proposes a thermodynamic cosmological structure based on energy flow, normalized entropy, emergent time, the Grid–Higgs field, and the cognitive extension of thermodynamic symmetry.

The purpose of this article is to examine possible compatibilities and tensions between Magnusson’s proposal and the modal axioms of TO, considering the foundational, recent, and supporting/dialogical bibliography of the Theory of Objectivity. The analysis shows that EFC v2.1 has strong thematic affinity with TO insofar as it attempts to unify cosmic structure, energetic dynamics, and cognition within a field architecture. However, it also presents important tensions regarding the modal grounding of its thermodynamic limits, the linearity of the relation between energy and entropy, the hypothesis of a variable speed of light, the replacement of dark matter by a measurable energy-flow field, and the reinterpretation of cosmic microwave background radiation.

It is argued that TO can offer Magnusson’s model a more rigorous ontological discipline, especially through the Seven Absolute Truths, the phenomenic elements, the Inducer Effects, the cosmogonic theorem, and the cosmological Eras. At the end, the article places EFC v2.1 on a scale of dialogue with TO, assigning it a high but not full score, due to its integrative potential still requiring greater formalization and testability.

**Keywords:** Theory of Objectivity; Energy-Flow Cosmology; Morten Magnusson; entropy; thermodynamic cosmology; Grid–Higgs field; information; cognition; Inducer Effects; alternative cosmology; origin of the universe.

# 1. Introduction

Contemporary cosmology lives in a permanent tension between the observational robustness of the standard model and the emergence of alternative proposals that seek to reinterpret the origin, structure, and dynamics of the universe. The dominant cosmological model, articulated around cosmic expansion, cosmic microwave background radiation, primordial nucleosynthesis, dark matter, and dark energy, remains highly effective in predictive and observational terms. Nevertheless, the very need for components not directly observed, such as dark matter and dark energy, keeps open a space for ontological investigations and physical-cosmological alternatives.

It is in this context that Morten Magnusson’s article, *Energy-Flow Cosmology (EFC v2.1): Modular Synthesis across Structure, Dynamics, and Cognition* (Magnusson 2025), is situated. Magnusson’s proposal seeks to organize a cosmology based on energy flow, entropy, the emergence of time, a structural field called Grid-Higgs, and a cognitive extension of the cosmological process. Its aim is to formulate a modular synthesis that unites structure, dynamics, and cognition through a universal principle: energy flow as mediator between order and entropy.

The present analysis takes this article as an object of critical-propositional confrontation with the Theory of Objectivity — TO — whose foundational bibliography affirms the need for a third theory of the origin of the universe, alternative both to the Big Bang and to Creationism, and based on its own logical-ontological foundations (Cabannas and Silva 2016; Cabannas and Silva 2018). TO does not present itself merely as a local physical hypothesis, but as an attempt to found universal existence modally, beginning from the so-called Seven Absolute Truths, the phenomenic elements, the Inducer Effects, the cosmogonic theorem, and the cosmological Eras.

The analysis developed here does not seek to empirically validate EFC v2.1 or convert it into confirmation of TO. The objective is more precise: to examine the extent to which Magnusson’s thermodynamic cosmology dialogues with TO, where its intuitions converge, and where tensions arise with the modal discipline of the axioms. The central concern is to distinguish conceptual affinity from scientific confirmation. EFC v2.1 offers a fertile interlocutor, but its fertility depends on its ability to transform cosmological analogies into necessary and testable formalizations.

## 2. The analyzed article and its conceptual architecture

Magnusson’s article proposes Energy-Flow Cosmology v2.1 as a synthesis of three modular domains. The first is the structural domain, EFC-S, grounded in the *Halo Model*

of Entropy. The second is the dynamical domain, EFC-D, based on the *Energy-Flow Model*. The third is the cognitive domain, EFC-C, associated with the CEM-Cosmos model.

The structure of EFC v2.1 can be summarized in a central thesis: the universe would be organized by a fundamental energy flow,  $E_f$ , operating in relation to normalized entropy,  $S$ , and emergent time,  $t$ . This flow would not be merely a local physical magnitude, but a universal mediator between cosmic structure, dynamical evolution, and cognitive reflection.

In the structural domain, Magnusson proposes that cosmic and galactic halos need not be explained by non-baryonic dark matter, but by entropic tensions within a continuous medium called the Grid-Higgs Field. The equation indicated by the author is:

$$\nabla \cdot [k(S)\nabla E_f] = \frac{\partial V(E_f, S)}{\partial S}. \quad (1)$$

In this formulation,  $k(S)$  represents entropy-dependent permeability, and  $V(E_f, S)$  represents the effective potential governing local equilibrium. The intention is to explain halo structures as stationary solutions of an entropic-energetic field.

In the dynamical domain, the author proposes the fundamental relation:

$$E_f(S) = E_0(1 - S). \quad (2)$$

This equation indicates that energy flow decays linearly with normalized entropy. As  $S$  approaches 1, energy flow tends toward reduction; when  $S$  approaches 0, energetic concentration tends toward its maximum. Time, in turn, is treated as emerging from a relation between entropy and evolution:

$$S(t) \propto e^t. \quad (3)$$

The article also introduces the idea of a variable speed of light on a cosmological scale:

$$c(S) \propto \frac{1}{\rho(S)}. \quad (4)$$

This hypothesis states that the speed of light would emerge from the density and coherence of the Grid-Higgs field, remaining locally constant while varying cosmologically.

In the cognitive domain, EFC-C proposes that consciousness or cognition is an extension of thermodynamic symmetry into informational systems. The cognitive field is

represented by:

$$\Psi_{CEM} \sim f(E_f, S, t). \quad (5)$$

Consciousness would emerge as an adaptive stabilization of energy flow through informational gradients. Thus, EFC v2.1 proposes that structure, energy, and cognition belong to one and the same thermodynamic continuum.

### 3. Energy-Flow Cosmology as an alternative thermodynamic cosmology

EFC v2.1 should be understood as an alternative cosmology because it proposes to reinterpret central components of the standard model. Instead of accepting dark matter and dark energy as ontologically independent components, Magnusson suggests that cosmic structure could be explained by a measurable energy-flow field,  $E_f$ , operating between the limits  $S = 0$  and  $S = 1$ .

This strategy brings the article close to a tradition of models that seek to replace entities not directly observed with field dynamics, modified geometry, entropic relations, or emergent properties of spacetime. The difference is that Magnusson does not limit his proposal to the physical-structural domain. He expands cosmology to include cognition, information, and consciousness as phases or expressions of the same thermodynamic order.

In this respect, EFC v2.1 has affinities with philosophical-physical perspectives that treat the universe as a dynamic totality, not as a sum of isolated objects. This affinity can be brought near Bohm's concern with wholeness and the implicate order (Bohm 1980), Prigogine and Stengers' discussion of order, chaos, and irreversibility (Prigogine and Stengers 1984), and approaches that view information and structure as fundamental dimensions of physical reality.

However, EFC v2.1 assumes significant risks. By reinterpreting dark matter, cosmic microwave background radiation, and the speed of light, it enters into tension with pillars of modern cosmology and physics, including Einstein's relativity (Einstein 1920), the cosmology of the primordial universe discussed by Weinberg (1993), Hawking's cosmological exposition (Hawking 1988), and the observational parameters of the Planck Collaboration (Planck Collaboration 2020). The proposal is therefore conceptually bold, but it requires mathematical and empirical formalization far beyond what is presented in the analyzed text.

## 4. The Theory of Objectivity and the modal discipline of the axioms

The Theory of Objectivity affirms that the origin and structure of the universe must be thought from necessary logical-ontological foundations. In its foundational bibliography, TO presents itself as a third theory of the origin of the universe, alternative to the Big Bang and to Creationism (Cabannas and Silva 2016; Cabannas and Silva 2018). This alternative does not merely consist in denying existing models, but in proposing its own axiomatic and cosmogonic system.

The Seven Absolute Truths of TO function as modal principles. This means that they are not treated merely as contingent empirical hypotheses, but as necessary conditions for any existential universe to be differentiated, structured, and recognized as such. Among these truths are the affirmation that Nothingness is a primitive and eternal mathematical essence; that every element has a magnetic field or aura that makes it unique; that infinity represents the non-element necessary for the logical definition of the universe; that two distinct elements require at least one boundary line between them; that an element exists fully only if observed by at least two others; that every element is composed of elements prior to it; and that there is no existential universe without a substance transcendent to its quantum.

The recent bibliography of TO expands this horizon by discussing the passage from modal axioms to empirical contact, the law of the logical minimum, Gödelian discipline, testability, the phenomenic table, and operational bridges with contemporary physics and artificial intelligence (Cabannas and Silva 2025; Cabannas and Silva 2026a; Cabannas and Silva 2026b). Therefore, TO should not be interpreted as pure speculative metaphysics, but as an attempt to articulate logical necessity, physical ontology, and the possibility of testing.

This modal discipline is the central criterion of the present analysis. The question is not only whether EFC v2.1 speaks of energy, entropy, field, and consciousness. The question is whether these concepts are articulated as necessary requirements of universal existence or whether they remain functional hypotheses of an alternative model.

## 5. General compatibilities between EFC v2.1 and TO

The first major compatibility between EFC v2.1 and TO lies in the effort toward unification. Magnusson seeks to unify structure, dynamics, and cognition within a cosmological system. TO, in turn, seeks to unify origin, elements, fields, boundaries, inducer



effects, transcendent information, and cosmological eras within a physical ontology. In both cases, the universe is thought as an articulated totality.

The second compatibility lies in the refusal of isolated and self-sufficient matter. In EFC, cosmic structure depends on the Grid–Higgs field and entropic gradients. In TO, every element is situated by its field, its aura, its boundaries, and its prior relations. Existence is not isolation, but relation.

The third compatibility lies in the centrality of flow. EFC formulates energy flow as a universal mediator. TO, although it does not reduce reality to energy flow, describes cosmic formation through processes, tracks, currents, memory, extrusion, and inductions. The notion of flow can therefore be integrated into TO as a phenomenic expression of objective relations in motion.

The fourth compatibility lies in the recognition that cognition belongs to the cosmos. EFC-C understands consciousness as an informational extension of thermodynamic dynamics. TO also does not treat thought, memory, or consciousness as entities external to the universe, but as results of objective relations and informational production. The difference, however, lies in the mode of grounding: in TO, the transcendent element is the knowledge or information produced in atomic relations and equivalent to atomic radiations.

The fifth compatibility lies in the alternative character in relation to the standard cosmological model. TO presents itself as an alternative to the Big Bang and to Creationism (Cabannas and Silva 2016). EFC v2.1 also attempts to reinterpret cosmic origin and structure, including cosmic microwave background radiation and dark components. Both therefore participate in a critical space in relation to the dominant paradigm, although by different paths.

## **6. Points of tension between EFC v2.1 and the axioms of TO**

The first tension appears in the treatment of the origin-limit. EFC works with  $S = 0$ , associated with singularity and energetic emission. TO, however, begins from Nothingness as a primitive and eternal mathematical essence. The Nothingness of TO is not simply low entropy, physical singularity, or infinite density. It is the modal condition of possibility of differentiation. Therefore,  $S = 0$  can dialogue with TO only if it is reinterpreted as a physical expression of a prior logical condition, and not as a sufficient origin.

The second tension concerns the field. The Grid–Higgs Field functions in EFC as

a continuous medium of structuring. In TO, every element has its own field or aura. If Grid-Higgs is understood merely as a homogeneous medium, it may erase the singularity of elements. To approach TO, it would need to be conceived as a field capable of containing singular differentiations, local auras, and objective boundaries.

The third tension lies in the status of infinity. TO affirms that infinity represents the non-element necessary for the logical definition of the universe. EFC operates with  $S = 1$  as an altular limit, but it does not clarify whether this limit has an ontological, mathematical, or merely thermodynamic function. TO would require this limit to be justified as a modal necessity, and not merely as a convention of the model.

The fourth tension lies in observation. TO affirms that an element exists fully only if observed by at least two others. This observation is not necessarily human consciousness, but objective relationality. EFC-C speaks of cognition and consciousness, but may conflate physical observation, informational record, and reflective consciousness. TO allows these levels to be organized with greater precision.

The fifth tension lies in composition by anteriority. EFC affirms that structure, dynamics, and cognition derive from the same energy flow. However, TO requires that every element be composed of elements prior to it. This means that the emergence of cognition, for example, cannot be merely a thermodynamic analogy; it must be demonstrated as the result of prior chains of elemental, atomic, radiative, and informational relations.

The sixth tension lies in the transcendent element. For TO, there is no existential universe without a substance transcendent to its quantum. This substance is knowledge or information produced in atomic relations, equivalent to atomic radiations. EFC comes close to this point, but still seems to subordinate information to energy flow. TO requires a more precise ontology of information as objective relational production.

## **7. Energy, entropy, boundary, and field: a phenomenic reading**

From the standpoint of the phenomenic elements of TO, EFC v2.1 can be read as an attempt to formalize four central elements: energy, field, boundary, and information.

Energy appears as  $E_f$ , a fundamental flow that crosses structure, dynamics, and cognition. In TO, energy must not be converted into an absolute substance, since every phenomenon derives from more fundamental objective relations. However, the concept of energy flow can be accepted as a phenomenic expression of an objective relation in motion. Thus,  $E_f$  would be less a first entity and more an operational manifestation of

inductions and boundaries.

Entropy appears in EFC as a normalized variable,  $S$ , which regulates density, energy flow, and temporal emergence. TO can reinterpret entropy as a phenomenic measure of differentiation, dispersion, memory, and limit. Entropy, in this case, would not be merely disorder, but an index of the relational history of elements.

Boundary appears in EFC through entropic gradients. Where there is a difference in  $S$ , there is tension; where there is tension, there is structure; where there is structure, there is gravitational manifestation. This reading is highly compatible with the fourth truth of TO, according to which two distinct elements require at least one boundary line. The boundary, in this sense, is not a geometric ornament, but a condition of objectivity.

The field appears as Grid–Higgs. TO can accept the idea of field provided that it does not eliminate the singularity of elements. The field must be understood as a medium of differentiation, not as an undifferentiated surface. The universe of TO is not a homogeneous block, but a totality of relations, boundaries, and auras.

## **8. Information, cognition, and the element transcendent to the quantum**

The point of greatest interest in the dialogue between EFC v2.1 and TO is the relation between information and cognition. Magnusson proposes that consciousness emerges as an adaptive stabilization of energy flow through informational gradients. This thesis has philosophical value because it avoids treating consciousness as a phenomenon external to the cosmos. It also avoids the rigid separation between physics and mind.

TO can accept this intuition, but it reorganizes it. In TO, the element transcendent to the quantum is not simply human consciousness, nor pure abstract information, nor undifferentiated energy. It is the knowledge or information produced in atomic relations and equivalent to atomic radiations. This definition is decisive because it displaces the question of consciousness toward a relational ontology of information.

Cognition, therefore, does not emerge from nothing. It is a complex phase of prior informational processes. Before reflective consciousness, there are atomic relations; before stabilized atomic relations, there are fields, boundaries, embryonic memory, logical tracks, and inductions. Consciousness would be a late form of organization of information, but informationality would already be inscribed in the relational fabric of the universe itself.

At this point, EFC-C requires further development. By writing  $\Psi_{CEM} \sim f(E_f, S, t)$ , Magnusson offers a formal analogy, but he still does not demonstrate the passage from energy to information, from information to record, from record to memory, from memory

to cognition, and from cognition to reflective consciousness. TO can contribute to this chain, especially through its conception of phenomenic elements and Inducer Effects.

## 9. EFC v2.1 before the Inducer Effects of TO

Reading EFC in light of the Inducer Effects allows one to understand both its potential and its gaps.

The first is the Structural Inducer Effect. In EFC-S, cosmic halos arise as manifestations of entropic tension in the Grid–Higgs Field. This formulation can be interpreted as structural induction: differences in entropy induce density, curvature, and configuration. TO can recognize a relevant convergence at this point.

The second is the Dynamical Inducer Effect. In EFC-D, the relation between  $E_f$ ,  $S$ , and  $t$  indicates that energy flow, as it decays with entropy, produces the appearance of temporal evolution. Time ceases to be an absolute stage and becomes an expression of process. This dialogues with contemporary approaches to emergent time and with TO itself, which understands temporality from cosmogonic phases and prior relations.

The third is the Informational Inducer Effect. In EFC-C, cognition emerges from informational gradients. TO expands this point by affirming that transcendent information is produced in atomic relations and is equivalent to atomic radiations. Thus, information is not merely a cognitive signal, but the objective product of physical relations.

The fourth is the Reductive Inducer Effect. Consciousness, for Magnusson, would be an adaptive stabilization of  $E_f$ . This stabilization can be reread as inducer reduction: the multiplicity of flows is organized into patterns of memory, perception, and reflection. In TO, this process can explain the passage from phenomenic dispersion to the unit of reason.

However, EFC still does not formalize these effects as distinct classes of operation. It presents suggestive relations, but not a systematic table of inductions. TO can offer a more rigorous language to classify the passages between field, energy, structure, information, and consciousness.

## 10. The cosmogonic theorem of TO and the critical reading of cosmic origin

The cosmogonic theorem of TO begins from the need to explain the genesis of the universe without reducing origin to an initial physical explosion or to an external supernatural creation. Origin is thought from Nothingness as a primitive mathematical essence, from Antagonistic Tempus, boundaries, logical tracks, embryonic memory, logical currents, the formation of elements, and the cosmological Eras.

EFC v2.1 dialogues with this horizon because it also rejects a purely explosive interpretation of origin. Its cosmological image is one of emission, recirculation, equilibrium, and flow. The universe does not appear as a single event enclosed in the past, but as a continuous thermodynamic process between  $S = 0$  and  $S = 1$ .

This approximation is important. TO can recognize in EFC an attempt to replace the linear narrative of the beginning with an architecture of circulation and tension. However, the difference remains: TO requires genesis to derive from modal necessity, whereas EFC proposes a still hypothetical thermodynamic structure.

The interpretation of cosmic microwave background radiation as a living equilibrium between emission and recirculation is particularly relevant. It approaches TO's critique of the absolutization of the Big Bang, but it faces strong tension with the standard cosmological model. For this hypothesis to become scientifically robust, it would be necessary to explain with precision CMB anisotropies, observed cosmological parameters, primordial nucleosynthesis, and structure formation. Without this, EFC remains a theoretical provocation, not a confirmed replacement.

## 11. The cosmological Eras of TO and the three domains of EFC

The tripartite structure of EFC can be compared to the cosmological Eras of TO, although it does not correspond exactly to them.

The Antagonistic Era of TO can be related to the polarity  $S = 0$  and  $S = 1$  in EFC. Both involve opposing limits and origin-tension. However, TO conceives antagonism as a logical condition, while EFC formulates it as an entropic limit.

The Era of Logical Tracks can be compared to the gradients and stationary solutions of EFC-S. The tracks of TO indicate paths of ordering; the gradients of EFC indicate paths of structural stabilization.

The Era of Logical Currents of Tertiary Plasma can dialogue with the EFC-D domain. Energy flow, entropy, and emergent time can be read as a physical formulation of dynamical currents that lead cosmic structuring.

The Centrifugal Era can be approximated to energetic emission and recirculation between the limits  $S = 0$  and  $S = 1$ . EFC suggests movement, redistribution, and return, while TO describes extrusion, centrifugation, and differentiation.

The Era of Units of Intelligence finds correspondence in the EFC-C domain. Cognition, in EFC, is a thermodynamic extension; in TO, it is the result of a relational history involving memory, thought, information, and atomic radiation.

This comparison shows that EFC has potential for structural dialogue with TO. However, TO presents a more articulated cosmogonic narrative in phases, while EFC presents functional modules. Convergence would be greater if Magnusson transformed his three domains into a sequence of ontological emergence.

## 12. Dark matter, CMB, and the speed of light: tensions with standard cosmology

EFC v2.1 proposes three critical displacements in relation to standard cosmology.

The first is the replacement of dark matter by a structural response of the Grid-Higgs Field to entropic gradients. The proposal is conceptually interesting, since it attempts to explain halos and gravitational effects without postulating invisible non-baryonic matter. However, this displacement requires facing data such as galactic rotation curves, gravitational lensing, clusters, structure formation, and anisotropies of cosmic microwave background radiation. TO can accept the attempt to explain gravity as the emergence of convergence zones, according to its recent bibliography (Cabannas and Silva 2026c), but it cannot dispense with the requirement of observational confrontation.

The second displacement is the reinterpretation of CMB. Magnusson describes it as a stationary thermodynamic equilibrium, not as relic radiation. This hypothesis contrasts with standard cosmology, in which CMB is central evidence of a hot and dense primordial universe, as discussed by Weinberg (1993), Hawking (1988), and the Planck Collaboration (Planck Collaboration 2020). TO can dialogue critically with the standard model, but replacing the interpretation of CMB must explain the same data with equal or greater precision.

The third displacement is the hypothesis of a cosmologically variable speed of light. Einstein's special and general relativity establish the local constancy of  $c$  as a fundamental structure of modern physics (Einstein 1920). EFC attempts to preserve local constancy

while admitting cosmological variation. This distinction is not impossible in speculative terms, but it requires rigorous formulation in order not to contradict astrophysical measurements, nucleosynthesis, quasar spectra, gravitational lenses, and gravitational-wave propagation.

TO must treat these proposals with critical openness. They are relevant because they expand the field of ontological possibilities, but they do not yet constitute empirical confirmations either of EFC or of TO.

### 13. Testability, operational bridges, and epistemological prudence

The recent bibliography of TO insists on the need to move from modal axioms to empirical contact, through operational bridges, boundaries of testability, and logical-formal discipline (Cabannas and Silva 2026a; Cabannas and Silva 2026b). This requirement is fundamental for evaluating EFC v2.1.

Magnusson’s article presents equations and hypotheses, but it does not report its own empirical test capable of directly corroborating its cosmology. It also does not present quantitative adjustment to cosmological databases, statistical comparison with  $\Lambda$ CDM, new numerical predictions, or independent observational analysis.

This does not invalidate the article as a theoretical proposal. Many theories begin as conceptual structures. However, it prevents it from being treated as empirical confirmation. The appropriate role of EFC v2.1, at this stage, is that of a speculative interlocutor, capable of provoking new formulations and suggesting future bridges.

From TO, some operational bridges can be proposed for a possible expansion of the model:

1. Define observables associated with  $E_f$ .
2. Derive galactic rotation curves from  $k(S)$  and  $V(E_f, S)$ .
3. Compare predictions of entropic halos with gravitational lensing.
4. Formulate an evolution equation for  $S(t)$  compatible with normalization between 0 and 1.
5. Specify how  $c(S)$  preserves local relativity.
6. Explain CMB quantitatively as stationary equilibrium.

7. Distinguish physical information, atomic radiation, memory, and cognition.
8. Build falsifiability criteria for EFC-C.

These bridges would bring EFC closer to the empirical discipline required by TO.

## 14. Propositional contributions of TO to Magnusson's model

TO can contribute to Magnusson's model on five levels.

At the ontological level, TO can offer a distinction between modal foundation and physical hypothesis. EFC begins from  $S = 0$  and  $S = 1$ , but it does not demonstrate that these limits are necessary. TO can help reinterpret them as physical manifestations of deeper logical conditions.

At the phenomenic level, TO can organize the concepts of energy, field, boundary, memory, information, and cognition into a table of elements. This would prevent energy from being taken as an absolute principle, placing it back within a relational mesh.

At the cosmogonic level, TO can expand EFC with a narrative of emergence in phases. Instead of only three modules, cosmology could be articulated as a process: Nothingness, antagonism, boundary, tracks, memory, currents, elements, radiations, cognition, and units of intelligence.

At the informational level, TO can correct the tendency to subordinate information to energy. Information, as knowledge produced in atomic relations and equivalent to atomic radiations, has a status transcendent to the quantum. It is not merely mental content nor a simple thermodynamic effect.

At the empirical level, TO can require EFC to produce operational bridges. Theoretical boldness is welcome, but it must be accompanied by criteria for testing, comparison, and possible refutation.

## 15. Position of the analyzed article on the scale of dialogue with TO

On a scale from zero to ten, Morten Magnusson's article receives the following score:

**8.2 / 10**



The score is high because EFC v2.1 dialogues intensely with fundamental themes of TO: alternative origin, structuring field, energy flow, entropy, emergent time, information, cognition, and critique of dark components in standard cosmology.

The score is not higher because the proposal still lacks explicit modal grounding, robust empirical formalization, precise distinction between energy and information, mathematical justification of normalized entropy, compatibility with relativity, and detailed confrontation with data concerning CMB, dark matter, and structure formation.

Thus, EFC v2.1 does not confirm TO, but constitutes a privileged interlocutor for its critical–propositional program. It offers thermodynamic and informational language that can be reinterpreted in light of the axioms, the Inducer Effects, and the cosmological Eras of the Theory of Objectivity.

## 16. Final considerations

The analysis of Morten Magnusson’s article *Energy-Flow Cosmology (EFC v2.1): Modular Synthesis across Structure, Dynamics, and Cognition* shows that the proposal has high potential for dialogue with the Theory of Objectivity. Its attempt to integrate structure, dynamics, and cognition into a cosmology of energy flow places it in the field of theories that seek to overcome the fragmentation between physics, information, and consciousness.

TO recognizes in this effort a relevant affinity. The universe, both in EFC and in TO, is not a mere collection of objects, but a dynamic totality. Energy is not separate from structure; structure is not separate from information; information is not separate from cognition. This intuition is powerful and brings Magnusson close to central concerns of TO.

However, TO also imposes a rigorous critique. EFC still needs to demonstrate the modal necessity of its foundations, clarify the ontological status of the Grid–Higgs Field, formalize the passage from energy to information, justify its entropic equation, reconcile its variable speed of light with local relativity, and present empirical tests capable of distinguishing its predictions from those of the standard model.

The most promising contribution of TO is to offer a discipline of foundation: every field must be thought from elements; every element requires boundary; every boundary requires relation; every relation produces information; all information produced in atomic relations has value transcendent to the quantum; and every existential universe requires this transcendent substance in order not to be reduced to mere physical extension.

EFC v2.1, therefore, is more than an isolated hypothesis. It can be interpreted

as a point of convergence between thermodynamic cosmology, informational ontology, and philosophy of nature. Its dialogue with TO is fruitful precisely because it reveals both compatibilities and insufficiencies. From TO, Magnusson's model can be read as a cosmological intuition in search of modal discipline.

## A. Appendix in TO style

### A.1. Critical–propositional statement in the language of the Theory of Objectivity

If the universe is thought only as energy flow, then energy risks occupying the place of absolute foundation. But, for the Theory of Objectivity, no flow is first without boundary, no boundary is objective without distinction, no distinction is full without relation, no relation is preserved without memory, no memory is transmitted without information, and no information becomes transcendent without being produced in atomic relations as objective radiation.

Thus, Energy-Flow Cosmology must be read as a phenomenic approximation to the problem of origin, not as a sufficient modal foundation. Magnusson’s energy flow is relevant because it identifies movement, tension, and mediation. However, flow must still be modally grounded.

In the language of TO:

1. The  $S = 0$  of EFC is not yet the Nothingness of TO.
2. The  $S = 1$  of EFC is not yet infinity as the necessary non-element.
3. The Grid–Higgs Field is not yet the singular aura of each element.
4. The entropic gradient approaches the objective boundary.
5. Energy flow approaches the logical currents.
6. Thermodynamic cognition approaches the Units of Intelligence.
7. The information of EFC becomes fully compatible with TO only when recognized as knowledge produced in atomic relations and equivalent to atomic radiations.

### A.2. Proposal for a modal translation of EFC

The following modal translation can be proposed:

**Proposition 1:** Every energy flow presupposes a difference.

**Proposition 2:** Every difference presupposes a boundary.

**Proposition 3:** Every boundary presupposes at least two differentiable terms.

**Proposition 4:** Every differentiable term stabilizes itself only in relation to other terms.

**Proposition 5:** Every stabilized relation produces a record.

**Proposition 6:** Every relational record, when produced in atomic relations, constitutes objective information.

**Proposition 7:** Every objective information produced in atomic relations is informational radiation and, therefore, a substance transcendent to the quantum.

This sequence allows EFC to be reinterpreted within TO without reducing TO to EFC. Energy flow remains important, but it becomes a relational consequence, not an absolute foundation.

### A.3. Evaluative synthesis in TO style

Magnusson's cosmology is strong when it affirms that the universe is process.

It is strong when it recognizes that energy and structure are inseparable.

It is strong when it brings entropy and time closer together.

It is strong when it includes cognition within the cosmological horizon.

It is strong when it challenges the ontological passivity of dark matter.

But it is insufficient when it does not derive its limits from modal necessity.

It is insufficient when it does not distinguish energy from transcendent information.

It is insufficient when it does not explain the logical origin of boundary.

It is insufficient when it does not differentiate physical observation from reflective consciousness.

It is insufficient when it does not present its own empirical test.

It is insufficient when it treats CMB in an alternative way without reconstructing the entire observational set that supports its standard interpretation.

Therefore, EFC v2.1 must be received by TO as an interlocutor of high value, but not as confirmation. Its greatest contribution lies in offering a thermodynamic language of flow. Its greatest limitation lies in not yet possessing a modal ontology of objectivity.

## References

- Aspect, Alain, Philippe Grangier, and Gérard Roger. 1982. “Experimental Realization of Einstein-Podolsky-Rosen-Bohm Gedankenexperiment: A New Violation of Bell’s Inequalities.” *Physical Review Letters* 49: 91–94. <https://doi.org/10.1103/PhysRevLett.49.91>.
- Bohm, David. 1980. *Wholeness and the Implicate Order*. London: Routledge.
- Cabannas, V., and Silva. 2016. *Teoria da Objetividade: terceira teoria de origem do universo, alternativa à Teoria do Big Bang e ao Criacionismo*. Zenodo. <https://doi.org/10.5281/zenodo.17306198>.
- Cabannas, V., and SILVA, D. 2018. *THEORY OF OBJECTIVITY: Third theory of the origin of the universe, alternative to the Big Bang Theory and Creationism*. Zenodo. <https://doi.org/10.5281/zenodo.17012791>.
- Cabannas, V., and SILVA, D. 2020. *A ESFERA PERFEITA (Comentário Número 9 à Teoria da Objetividade)*. Zenodo. <https://doi.org/10.5281/zenodo.17013728>.
- Cabannas, V., and SILVA, D. 2025. *Teoria da Objetividade: Fundamentos Lógicos, Ontológicos e Científicos para uma Nova Física e Cosmologia (Diálogo com as Inteligências Artificiais)*. Zenodo. <https://doi.org/10.5281/zenodo.17295496>.
- Cabannas V., and Silva, D. 2026a. *From Modal Axioms to Empirical Contact: Gödelian Discipline, the Law of Logical Minimum, and Operational Bridges in the Theory of Objectivity*. 2.0. Zenodo. <https://doi.org/10.5281/zenodo.18154295>.
- Cabannas, V., and Silva, D. 2026b. *Modal Ontology and Testability: Boundaries, Convergence, and the Phenomenic Table of the Theory of Objectivity in Dialogue with Contemporary Physics and AI-Assisted Operational Bridges*. 1.0. Zenodo. <https://doi.org/10.5281/zenodo.18257429>.
- Cabannas, V., and Silva, D. 2026c. *Gravity as an Emergence of Convergence Zones: A Critical–Propositional Examination of Information Flux Theory in Light of the Theory of Objectivity (TO)*. 1.0. Zenodo. <https://doi.org/10.5281/zenodo.18306977>.
- Cabannas, V., and Silva, D. 2026d. *Quantum Field Theory and the Properties of the Vacuum: A Critical–Propositional Reading under the Modal Discipline of the Theory of Objectivity (TO)*. 1.0. Zenodo. <https://doi.org/10.5281/zenodo.18370212>.
- Cabannas, V., and Silva, D. 2026e. *THE MODAL DISCIPLINE OF COSMIC ORIGIN: A Critical–Propositional Analysis of the Big Bang Theory in Confrontation with the Theory of Objectivity*. 1.0. Zenodo. <https://doi.org/10.5281/zenodo.18370212>.

19034270.

- Einstein, Albert. 1920. *Relativity: The Special and the General Theory*. London: Methuen & Co.
- Hawking, Stephen. 1988. *A Brief History of Time*. New York: Bantam.
- Heisenberg, Werner. 1958. *Physics and Philosophy: The Revolution in Modern Science*. New York: Harper & Row.
- Kuhn, Thomas S. 1962. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- LIGO Scientific Collaboration and Virgo Collaboration. 2016. “Observation of Gravitational Waves from a Binary Black Hole Merger.” *Physical Review Letters* 116: 061102. <https://doi.org/10.1103/PhysRevLett.116.061102>.
- Magnusson, Morten. 2025. *Energy-Flow Cosmology (EFC v2.1): Modular Synthesis across Structure, Dynamics, and Cognition*. Figshare/Zenodo record indicated by the author. <https://doi.org/10.6084/m9.figshare.30455237>.
- Magnusson, Morten. 2025a. *Energy Flow Cosmology: Field Equations for Entropy-Driven Spacetime*. Figshare. <https://doi.org/10.6084/m9.figshare.30421807>.
- Magnusson, Morten. 2025b. *Energy-Flow Cosmology: A Thermodynamic Bridge Between General Relativity and Quantum Field*. Figshare. <https://doi.org/10.6084/m9.figshare.30402427>.
- Magnusson, Morten. 2025c. *CEM-Cosmos: A Field-Theoretic Model of Consciousness Coupled to Energy-Flow Cosmology*. Figshare. <https://doi.org/10.6084/m9.figshare.30275947>.
- Magnusson, Morten. 2025d. *Integrated Hypothesis on the Emergence of Time from Energy Flow and Entropy*. Figshare. <https://doi.org/10.6084/m9.figshare.28578263>.
- Magnusson, Morten. 2025e. *Grid-Higgs Framework: An Entropic and Structural Theory of Gravity, Dark Matter, and Black Holes*. Figshare. <https://doi.org/10.6084/m9.figshare.28559510>.
- Penrose, Roger. 2004. *The Road to Reality: A Complete Guide to the Laws of the Universe*. London: Jonathan Cape.
- Planck Collaboration. 2020. “Planck 2018 Results. VI. Cosmological Parameters.” *Astronomy & Astrophysics* 641: A6. <https://doi.org/10.1051/0004-6361/201833910>.
- Prigogine, Ilya, and Isabelle Stengers. 1984. *Order Out of Chaos: Man’s New Dialogue with Nature*. New York: Bantam.

Weinberg, Steven. 1993. *The First Three Minutes: A Modern View of the Origin of the Universe*. New York: Basic Books.