

The Generative Projection Framework

A Generative Projection Ontology of Physical and Consciousness Projection

Erik Axelkrans*

Submitted to Synthese, December 2025

Abstract

This paper presents a Generative Projection Ontology (GPO) as a unified ontological framework grounded in the Generative Projection Framework. The framework treats projection as an invariance-constrained principle of ontological reconstruction, specifying how coherent domains of structured description arise from shared generative conditions without introducing new empirical postulates or modifying domain-specific theories.

Within this framework, established physical descriptions—such as spacetime geometry, quantum theory, and field-theoretic structure—as well as descriptions associated with consciousness and psychological organization, are interpreted as effective realizations situated within distinct but co-projected sectors. These sectors are governed by domain-specific invariant organizational principles and are treated as ontologically robust without being hierarchically ordered or mutually reducible.

The generative level itself is defined purely in architectural terms. It is not identified with any physical substrate, mental substance, or neutral material, but functions as a structural condition that anchors projection relations across domains. Ontological unity is secured at this generative level, while plurality arises through projection into distinct sectors.

By separating ontological interpretation from domain-specific explanation, the Generative Projection Ontology avoids both reductive physicalism and substance dualism without invoking a mediating ontology. The framework is offered as an ontological clarification intended to stabilize interpretation across physics and theories of consciousness while preserving the autonomy and methodological integrity of effective descriptions within each domain.

*Independent Researcher, Gothenburg, Sweden, erik@axelkrans.se

1 Introduction

Modern fundamental physics is characterized by the coexistence of multiple highly successful theoretical frameworks that differ markedly in structure, interpretation, and domain of applicability. Quantum theory, spacetime geometry, and field-theoretic descriptions each provide precise and empirically validated accounts of physical phenomena, yet their mutual conceptual relations remain only partially clarified [1, 2, 3, 4]. Questions concerning the ontological status of spacetime, quantum states, and fields therefore continue to play a central role in foundational discussions.

A closely related set of difficulties arises in the context of consciousness and psychological theory. Here too, multiple explanatory frameworks coexist—ranging from phenomenological descriptions to formal and dynamical models—without a settled account of their ontological status or their relation to physical theory. As in physics, theoretical success does not straightforwardly determine ontological commitment, and disagreements frequently reflect differences in explanatory role rather than direct conflict about what exists.

Across both domains, a persistent difficulty is the tendency to conflate effective theoretical description with ontological interpretation. Dynamical equations, symmetry principles, and formal structures are often treated implicitly as statements about what fundamentally exists, even when their primary function is predictive or organizational. This conflation becomes especially pronounced when comparing frameworks formulated at different levels of description, where apparent incompatibilities may arise from differences in theoretical role rather than genuine ontological disagreement.

The aim of the present paper is not to propose a new physical theory, modify existing dynamics, or introduce additional empirical postulates. Nor is it to advance a theory of consciousness or psychological mechanism. Instead, the paper seeks to articulate an explicit ontological architecture within which established physical and consciousness-related descriptions can be systematically situated and interpreted (Throughout this paper, ‘ontology’ is used in a strictly architectural sense.). The focus is on clarifying how distinct domains of structured description may arise from shared generative conditions, rather than on resolving outstanding empirical or methodological problems within any single domain.

To this end, we introduce the Generative Projection Framework (GPF) as a methodological tool for ontological reconstruction. Familiar physical structures—such as spacetime geometry, quantum-mechanical state spaces, and field-theoretic entities—as well as structures associated with consciousness and psychological organization, are treated not as isolated primitives, but as effective descriptions situated within a generative–projective organization. Projection is employed neither as a physical process nor as an epistemic limitation, but as a structural principle for relating effective domain-specific descriptions to more general generative conditions.

By making this architectural perspective explicit, the paper contributes to foundational debates concerning emergence, fundamentality, and interpretation across both physics and theories of consciousness. While earlier analyses of the Generative Projection Framework were deliberately restricted to the physical domain [17], the present work treats physical and consciousness domains as parallel instances within a single ontological framework. The analysis that follows therefore proceeds without granting ontological priority to either domain, focusing instead on the shared architectural principles that underwrite their coexistence.

This paper is structured as follows: Section 2 clarifies the distinction between domain-

specific theory and ontological interpretation, motivating the need for an explicit ontological architecture. Section 3 introduces the Generative Projection Framework as a domain-neutral organizational structure grounded in the distinction between generative conditions and projected descriptions. Section 4 formulates projection as an invariance-constrained principle of ontological reconstruction. Section 5 summarizes the resulting Generative Projection Ontology and clarifies the ontological status of effective descriptions. Sections 6 and 7 apply the framework to the Physical Projection Sector and the Consciousness Projection Sector, respectively, treating them as parallel and co-projected domains. Section 8 articulates the unified ontological framework that emerges from this structure, and Section 9 situates the resulting ontology relative to familiar philosophical positions. Section 10 concludes with a summary of the framework and its implications.

2 Ontological Clarification versus Domain-Specific Theory

Foundational discussions frequently blur the distinction between domain-specific theory and ontological interpretation. Mathematical formalisms, dynamical equations, and symmetry principles are often treated as carrying implicit claims about what fundamentally exists, even when their primary function is predictive, structural, or organizational. While such identifications may be pragmatically useful within a given domain, they tend to obscure the different roles played by theory and ontology.

From a methodological standpoint, successful theories are constructed as effective descriptions tailored to specific domains of phenomena. In physics, this includes formalisms describing spacetime, quantum states, and fields; in theories of consciousness and psychology, it includes models describing experiential structure, cognitive organization, and dynamical patterns of mental change. In neither case does empirical or explanatory success alone determine the ontological status of the structures employed. This ambiguity becomes particularly salient when comparing frameworks formulated at different levels of description, where apparent incompatibilities may reflect differences in theoretical role rather than genuine ontological disagreement.

Ontological clarification, as understood in this paper, does not aim to revise, replace, or unify domain-specific theories. It neither introduces new explanatory mechanisms nor adjudicates between competing models within a domain. Instead, it seeks to articulate an explicit interpretive architecture within which the ontological status of theoretical structures can be assessed independently of their internal dynamics or empirical scope. Such clarification is neither speculative metaphysics detached from successful theory nor an attempt to extract ontology directly from formalism. Rather, it functions as an architectural layer that organizes theoretical constructs according to their generative and effective roles [6, 5].

Within this perspective, an ontological architecture distinguishes between levels of description without privileging any single theoretical framework as fundamental by default. Effective theories may be fully legitimate and ontologically robust within their domains of applicability while remaining derivative relative to a more general generative organization. Importantly, acknowledging such stratification does not undermine empirical adequacy, nor does it entail commitment to hidden variables, additional substances, or cross-domain reduction.

By separating ontological clarification from theory construction, it becomes possible to compare disparate explanatory frameworks on equal footing and to address questions of emergence and fundamentality without altering established theories. This separation is particularly important when considering domains that are traditionally treated asymmetrically, such as physical and consciousness-related descriptions. The Generative Projection Framework, introduced in the following section, is intended to provide precisely such an architectural context, allowing multiple domains of structured description to be situated within a single coherent ontology without ontological hierarchy.

3 The Generative Projection Framework (GPF)

The Generative Projection Framework (GPF) is introduced as an ontological architecture for organizing and interpreting established domain-specific theories. At the core of GPF is the distinction between a generative level and a set of projected levels. The generative level is intentionally left unspecified in domain-specific terms. It is not characterized by particular degrees of freedom, experiential primitives, fields, or equations, nor is it identified with any known physical or psychological formalism. Its function is purely architectural: to serve as a reference point from which coherent domains of structured description can be reconstructed through projection. This underdetermination is essential to maintaining neutrality with respect to candidate theories in any domain.

Projection within GPF is understood as a structural relation between the generative level and effective domain-specific descriptions. These descriptions may include spacetime geometry, quantum-mechanical state spaces, and field-theoretic entities, as well as structures associated with consciousness and psychological organization. Projection does not denote a dynamical evolution, a physical interaction, or an epistemic operation. Instead, it specifies how established theoretical structures may be situated as derivative realizations within a coherent ontological architecture.

By organizing theories in this way, GPF provides a principled account of how multiple effective frameworks can coexist without competition for ontological primacy. Distinct theories may correspond to distinct projections, each preserving characteristic structural features while remaining compatible at the architectural level. In this respect, the framework generalizes familiar ideas of emergence and effective description by embedding them within an explicit generative–projective organization that is not restricted to any single domain.

The level of abstraction at which GPF is formulated is deliberate. The framework does not attempt to explain the detailed mechanisms by which particular structures arise within a given domain, nor does it impose constraints on the mathematical or conceptual form of future theories. Its role is to clarify the ontological status of existing descriptions and their relations, rather than to extend or replace them. Subsequent sections apply this architectural perspective to specific projection sectors, illustrating how distinct domains of structured description can be situated within the same generative–projective framework. Figure 1 provides a schematic illustration of this organization.

Generative Projection Ontology (GPO)

(architectural structure specified by the Generative Projection Framework)

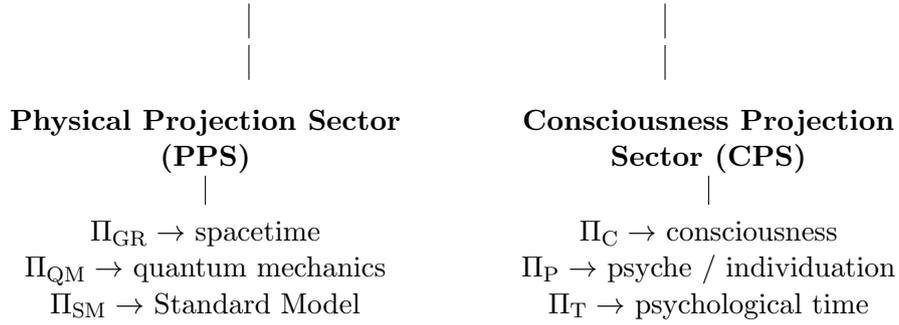


Figure 1: Generative Projection Ontology (GPO) as a unified ontological framework. The diagram represents the generative–projective structure underlying both physical and consciousness domains. The Generative Projection Framework specifies projection as an invariance-constrained architectural principle, while the Generative Projection Ontology is the ontological interpretation that results when this structure is read ontologically. The Physical Projection Sector (PPS) and the Consciousness Projection Sector (CPS) are shown as co-projected domains arising from a common generative level. The figure is architectural rather than dynamical and does not represent causal mechanisms or temporal processes.

4 Projection as an Ontological Reconstruction Principle

Within the Generative Projection Framework, projection is introduced as a methodological principle for ontological reconstruction. It is neither a process occurring in time nor an epistemic limitation associated with observation, measurement, or information loss. Instead, projection specifies a structural relation between generative conditions and effective domain-specific descriptions, allowing established theoretical frameworks to be situated within a coherent ontological architecture.

A defining feature of projection within GPF is that it is constrained by the preservation of structural invariants. Projected descriptions are not arbitrary representations of a generative level, but are required to preserve those invariant features—such as symmetry principles, conservation relations, relational consistency, or organizational regularities—that characterize the formal identity and stability of a given domain. In this sense, invariance functions as a necessary condition for admissible projections, independent of whether the domain in question is physical or consciousness-related.

Concrete realizations of invariant-constrained generative–projective constructions have been explored in earlier work regarding spacetime geometry, quantum structure, and gauge symmetries [13] as well as for consciousness [16]. Analogous considerations may apply to other domains of structured description, where invariant organizational patterns delimit the space of coherent models and effective theories. The present paper is concerned with the ontological role of such invariant-preserving reconstructions, rather than with their domain-specific realization.

This conception of projection must be distinguished from commonly used notions such as coarse-graining, approximation, or renormalization. Projection does not remove degrees of freedom, introduce scale-dependent truncations, or reflect observer-dependent limitations. Rather, it reconstructs effective descriptions in a manner that respects the invariant content that defines a domain’s internal coherence. The role of projection is therefore organizational rather than dynamical.

Importantly, the framework remains neutral with respect to how invariant structures are realized or maintained at the generative level. No assumptions are made concerning specific mechanisms of emergence, symmetry breaking, or reduction. Projection identifies which structural features must be preserved for a domain to be intelligible, without specifying how such preservation is implemented in domain-specific terms. This neutrality allows the framework to accommodate a wide range of existing approaches across different fields of inquiry.

By treating projection as an invariance-constrained reconstruction principle, the Generative Projection Framework provides a disciplined alternative to approaches that attempt to infer ontology directly from theoretical formalism. Ontological clarification proceeds by situating effective descriptions within a structured hierarchy defined by their invariant content, rather than by privileging particular entities or models as fundamental in isolation. This methodological stance preserves the integrity of established theories while offering a coherent ontological framework that is not restricted to any single domain.

5 Ontological Status: Generative Projection Ontology and Effective Descriptions

The ontological structure articulated in the preceding sections may be summarized at the level of a Generative Projection Ontology (GPO). GPO does not introduce a new domain of entities, nor does it posit an additional layer of physical or mental dynamics. Its function is exclusively architectural: to specify how effective domains of structured description are situated relative to shared generative conditions.

Within GPO, the generative level is defined in structural terms only. It is not characterized by domain-specific degrees of freedom, observables, experiential primitives, or formal equations. Nor is it identified with any physical, psychological, or neutral substrate. Its role is to anchor projection relations, not to serve as an object of domain-level description.

Effective descriptions—whether physical or consciousness-related—retain their full explanatory and descriptive validity within their respective domains. Their status as projected structures does not render them approximate, instrumental, or ontologically deficient. Rather, it clarifies the sense in which their coherence and applicability depend on invariant-preserving projection from a common generative level.

GPO carries no independent empirical or explanatory content. It does not generate predictions, constrain domain-specific dynamics, or compete with established theories. Its contribution lies solely in ontological clarification: distinguishing between generative conditions and projected descriptions, and thereby separating ontological interpretation from domain-specific explanation.

This completes the ontological groundwork of the framework. The sections that follow do not introduce new ontological commitments, but examine how specific projection sectors instantiate the generative–projective architecture already established.

6 The Physical Projection Sector (PPS)

As schematically illustrated in Fig. 1, the Physical Projection Sector (PPS) comprises those projected structures that correspond to established physical descriptions, including spacetime geometry, quantum-mechanical state spaces, and field-theoretic entities (the standard model). Within the Generative Projection Framework, these structures are interpreted as effective realizations reconstructed through projection from the generative level, subject to constraints imposed by the preservation of characteristic physical invariants.

The PPS is introduced here as a first concrete instance of the generative–projective architecture, not as an ontologically privileged domain. Its placement reflects historical and methodological familiarity rather than fundamental priority. The ontological status of physical structures follows from the general principles articulated in the preceding sections and does not depend on them being treated as the primary or exclusive realization of projection.

Each major physical framework is defined by a distinct set of invariant structures. Spacetime geometry is characterized by diffeomorphism invariance and geometric consistency relations; quantum theory by unitary invariance and probabilistic structure; and gauge field theories by local symmetry principles and associated conservation laws. Within GPF, such invariants delimit the class of admissible projections, ensuring that effective physical descriptions retain both their formal identity and empirical coherence.

From this architectural perspective, different physical theories need not be understood as competing for ontological primacy. Instead, they may be regarded as distinct projections that preserve different invariant aspects of the same generative organization. Apparent tensions between frameworks (i.e. paradoxes)—for example, between quantum theory and spacetime geometry—can thus be reinterpreted as reflecting differences in projected structure rather than direct ontological incompatibility [13]. The PPS provides a neutral context in which multiple physical descriptions can coexist without reduction to a single fundamental formalism.

Crucially, the generative–projective organization introduced here does not alter the internal content of physical theories. Their mathematical formalisms, symmetry principles, and dynamical equations remain unchanged. The role of the PPS is interpretive rather than unificatory: it situates established physical frameworks within a common ontological architecture without subsuming them under a single explanatory scheme.

By situating physical theories within the PPS, the Generative Projection Framework clarifies how invariant-preserving projections can give rise to multiple, mutually consistent physical descriptions. This architectural perspective supports a structured understanding of physical emergence while remaining fully compatible with the methodological standards of foundations of physics. As the following section will show, the same generative–projective principles apply equally to non-physical domains of structured description.

The Physical Projection Sector has been explored in more detail in a series of earlier works developing the generative–projective approach within contemporary physics [10, 11, 12, 13]. These studies examine how spacetime geometry, quantum-mechanical structure, and gauge symmetries may be interpreted as effective realizations reconstructed through invariance-constrained projection from a common generative level. Rather than proposing modifications to established physical theory, this line of work focuses on clarifying the ontological status of existing formalisms and their mutual relations within a unified architectural framework. The present paper does not repeat these analyses, but situates them within the broader Generative Projection

Ontology by treating the Physical Projection Sector as one instantiation of a domain-neutral projection principle.

7 The Consciousness Projection Sector (CPS)

The Generative Projection Framework, as articulated in the preceding sections, is structurally general. Nothing in the generative–projective architecture restricts projection to physical descriptions alone. Once projection is understood as an invariance-constrained principle of ontological reconstruction, the possible existence of additional projection sectors follows directly from the framework’s internal logic.

The Consciousness Projection Sector (CPS) comprises projected structures associated with consciousness, subjectivity, and psychological organization. As with the Physical Projection Sector, these structures are interpreted as effective realizations reconstructed through projection from the same generative level. The CPS is not introduced as an emergent byproduct of physical dynamics, nor as an ontologically independent realm. Instead, it is treated as a parallel projection sector, governed by the same architectural principles and distinguished only by the class of invariants it preserves.

What characterizes the CPS is not its experiential content as such, but the presence of stable organizational patterns that define coherent domains of consciousness-related description. These include regularities of experiential structure, coherence relations, developmental trajectories, and lawful transformations of psychological organization. Such invariant features delimit the space of admissible models and theories within the CPS in a manner directly analogous to the role of symmetry and conservation principles in physical domains.

Within this sector, consciousness-related descriptions retain full ontological robustness within their domain of applicability. Their status as projected structures does not render them derivative in an explanatory or instrumental sense. Rather, it situates them ontologically relative to the generative level, without reducing them to physical descriptions or elevating them to fundamental substances.

Effective dynamical descriptions operating within the CPS—such as formal models of psychological change or equations characterizing coherence and transformation—are interpreted as domain-specific, in the same sense as effective equations in the Physical Projection Sector. They describe lawful relations internal to the projected domain without specifying the generative source itself. Ontological dependence on the generative level therefore does not entail explanatory dependence on physical mechanisms.

A central implication of introducing the CPS explicitly is that consciousness is no longer treated as an ontological anomaly within an otherwise physical ontology. Instead, consciousness domains are recognized as legitimate projection sectors, stabilized by invariant organizational principles and situated on equal ontological footing with physical domains. The distinction between PPS and CPS reflects differences in projected structure, not differences in ontological status.

By situating consciousness within the same generative–projective architecture as physical theory, the framework avoids both reductive physicalism and substance dualism. Physical and consciousness domains are neither collapsed into one another nor separated into independent ontological foundations. They are co-projected from a common generative level and remain autonomous within their respective domains.

The Consciousness Projection Sector has likewise been developed in a series of complementary works addressing psychological organization, coherence, and processes of individuation within a generative–projective framework [14, 15, 16]. These studies investigate how structured

patterns of experience and psychological transformation may be described as effective, law-governed realizations within a projected domain, without reduction to physical mechanisms or appeal to an independent mental substance. As in the physical case, the emphasis is on ontological clarification rather than explanatory replacement. The present paper does not rehearse these domain-specific analyses, but incorporates them architecturally by treating consciousness-related descriptions as a parallel projection sector governed by the same generative principles.

8 Generative Projection Ontology as a Unified Ontological Framework

With the articulation of both the Physical Projection Sector and the Consciousness Projection Sector, the consequences of the generative–projective architecture can now be stated explicitly. The Generative Projection Ontology (GPO) emerges not merely as a classificatory scheme, but as a unified ontological framework specifying how distinct domains of structured description coexist within a single architecture.

A central feature of GPO is the absence of ontological hierarchy between projection sectors. Physical and consciousness-related domains are not ordered by fundamentality, nor is one derived from the other. Both are understood as co-projected realizations arising from the same generative conditions and governed by the same invariance-constrained reconstruction principle. Their differences reflect differences in projected structure, not differences in ontological status.

This symmetry has important implications. First, it blocks reductive strategies that seek to explain one domain entirely in terms of another. Because both sectors depend ontologically on the generative level, neither can claim ontological priority over the other. At the same time, the framework avoids dualism: the plurality of domains does not arise from multiple foundational substances or independent ontological realms, but from multiple projections of a single generative architecture. The broader significance of this issue—particularly with respect to the adequacy of purely physicalist ontologies of mind—has been widely emphasized in contemporary philosophy [8].

GPO also clarifies the relationship between unity and plurality. Ontological unity is secured at the generative level, which functions as a shared structural condition for all projection sectors. Plurality arises only at the level of projection, where different invariant constraints give rise to distinct, irreducible domains of description. Unity is therefore architectural rather than material, and plurality is principled rather than *ad hoc*.

Importantly, GPO does not introduce new causal principles or cross-domain explanatory mechanisms. Causality, dynamics, and lawful relations remain internal to each projection sector and are described by domain-specific effective theories. The role of the ontology is not to explain interactions between domains, but to clarify the ontological status of the domains within which such explanations are formulated. Ontological dependence on the generative level does not entail explanatory dependence between sectors.

From this perspective, the Generative Projection Ontology is best understood as a framework of ontological coherence rather than ontological reduction. It allows multiple domains to be taken as fully real and law-governed within their respective scopes, while situating them within a single, unified ontological architecture. The framework thereby preserves the autonomy of domain-specific inquiry without fragmenting ontology.

By making the generative–projective structure explicit at the level of the whole framework, GPO provides a stable ontological reference for both physical theory and theories of consciousness. It delineates the limits of reductionist explanation while avoiding the proliferation of independent ontological foundations. In doing so, it offers a coherent, non-reductive account of reality grounded in shared generative conditions rather than in a privileged category of entities or descriptions.

9 Philosophical Implications and Ontological Positioning

The Generative Projection Ontology occupies a distinct position within contemporary ontology and philosophy of science. This architectural distinction echoes the classical separation between scientific description and its philosophical interpretation, often articulated as a contrast between the scientific image and its ontological reading [7]. Its central commitment is not to a particular category of entities but to an architectural distinction between generative conditions and projected domains of structured description. This commitment allows the framework to be situated relative to familiar ontological positions without being reducible to any of them.

First, GPO departs from reductive physicalism. While physical structures are treated as ontologically robust within the Physical Projection Sector, they are not regarded as ontologically exhaustive. Consciousness-related structures are not explained away as epiphenomenal consequences of physical dynamics, nor are they identified with physical states under an alternative description. Instead, both physical and consciousness domains are situated as co-projected realizations within a shared generative architecture.

At the same time, GPO avoids substance dualism. The framework does not posit two independent ontological foundations, nor does it divide reality into fundamentally distinct realms. The plurality of domains arises only at the level of projection, while ontological unity is secured at the generative level. There is therefore no bifurcation of ontology, despite the irreducibility of domain-specific descriptions.

The framework also differs from traditional forms of neutral monism. Although GPO rejects the ontological primacy of both physical and mental substances, it does not replace them with a neutral material or experiential substrate. The generative level is not characterized as a form of matter, information, or experience. Its neutrality is structural rather than substantive: it specifies conditions for projection without itself belonging to any projected domain.

In relation to structural realism, GPO shares an emphasis on structure over entities, but extends this emphasis beyond the physical sciences [9]. What is taken to be ontologically primary is not a particular structure within a domain, but the generative–projective relation that constrains how coherent domains can arise. Domain-specific structures are real and explanatory within their scope, yet ontologically contextualized by the architecture that supports them.

Methodologically, GPO enforces a clear distinction between explanation and ontological interpretation. Explanatory success remains tied to effective theories operating within projection sectors, governed by domain-specific principles and empirical constraints. Ontological interpretation, by contrast, concerns how such domains are situated within a broader generative framework. Conflating these roles leads either to unwarranted reduction or to metaphysical proliferation; separating them allows both scientific practice and ontological clarity to be maintained.

From this perspective, debates concerning fundamentality are reframed. Rather than asking which domain provides the ultimate account of reality, GPO directs attention to the structural conditions under which different domains become intelligible and stable. Physics and theories of consciousness are not competitors for ontological priority, but complementary investigations of distinct projection sectors within a unified ontological architecture.

10 Conclusion

This paper has articulated a Generative Projection Ontology as a unified ontological framework grounded in the Generative Projection Framework. By clarifying the distinction between generative conditions and projected domains of structured description, the framework provides an explicit architectural context within which both physical and consciousness-related theories can be situated and interpreted.

Within this ontology, physical and consciousness domains are treated as co-projected sectors arising from a common generative level. Neither domain is granted ontological priority, nor is either reduced to the other. Instead, both are understood as effective realizations governed by invariant organizational principles appropriate to their respective domains. Ontological unity is achieved architecturally, through shared generative conditions, rather than reductively, through the privileging of a single domain or substance.

A central contribution of the Generative Projection Ontology is its separation of ontological interpretation from domain-specific explanation. Explanatory work proceeds within projection sectors through established theories, models, and effective dynamics. Ontological clarification, by contrast, concerns how such domains are related within a broader generative–projective structure. Maintaining this distinction preserves the autonomy of domain-specific inquiry while providing a coherent ontological framework in which multiple domains can be taken seriously.

By extending the generative–projective architecture beyond the physical domain to include consciousness and psychological structure, the present work removes an implicit asymmetry present in earlier, domain-restricted analyses. Physical and consciousness descriptions are no longer treated as belonging to fundamentally different ontological categories, but as parallel instances of projection governed by the same architectural principles.

The Generative Projection Ontology is not proposed as a final metaphysical system, nor does it introduce new empirical claims or explanatory mechanisms. Its purpose is clarificatory: to make explicit the ontological relations that are often left implicit in foundational discourse. In doing so, it offers a stable reference framework for interpreting diverse domains of structured description without enforcing ontological hierarchy or reduction.

In this sense, the framework aims to stabilize ontological interpretation across disciplines while remaining compatible with established theoretical practice. It provides a unified yet non-reductive account of reality grounded in shared generative conditions, leaving open the continued development of domain-specific theories within their respective projection sectors.

A forthcoming monograph will further develop these ideas in an integrated form, situating the approach within a wider interdisciplinary context and exploring its implications across psychological, philosophical, and ontological domains.

References

- [1] A. Einstein, *The Foundation of the General Theory of Relativity*, *Annalen der Physik* **49**, 769–822 (1916).
- [2] P. A. M. Dirac, *The Principles of Quantum Mechanics*, Oxford University Press, Oxford (1930).
- [3] S. Weinberg, *The Quantum Theory of Fields, Vol. I: Foundations*, Cambridge University Press, Cambridge (1995).
- [4] C. N. Yang and R. L. Mills, *Conservation of Isotopic Spin and Isotopic Gauge Invariance*, *Phys. Rev.* **96**, 191–195 (1954).
- [5] E. P. Wigner, *The Unreasonable Effectiveness of Mathematics in the Natural Sciences*, *Commun. Pure Appl. Math.* **13**, 1–14 (1960).
- [6] C. J. Isham, *Topological and Global Aspects of Quantum Theory*, in *Relativity, Groups and Topology II*, North-Holland, Amsterdam (1984).
- [7] W. Sellars, *Philosophy and the Scientific Image of Man*, in *Frontiers of Science and Philosophy*, R. Colodny (ed.), University of Pittsburgh Press, Pittsburgh (1962).
- [8] T. Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*, Oxford University Press, Oxford (2012).
- [9] S. French, *The Structure of the World: Metaphysics and Representation*, Oxford University Press, Oxford (2014).
- [10] E. Axelkrans, *Emergent Spacetime as Information Geometry: An Ontological Interpretation of Gravity as Projection* PhilArchive preprint (2025). <https://philpapers.org/rec/AXEESA-2>
Physics version submitted to Foundations of Physics (2025):
Part I: Emergent Spacetime and Gravity as Information Geometry
- [11] E. Axelkrans, “*Quantum Mechanics as a Projection Phenomenon: An Ontological Interpretation of Hilbert Space, Dynamics, and Measurement*” PhilArchive preprint (2025). <https://philpapers.org/rec/AXEQMA>
Physics version submitted to Foundations of Physics (2025):
Part II: Quantum Mechanics as a Projection Phenomenon
- [12] E. Axelkrans, “*Standard Model Gauge Symmetries from Projection Invariance: A Philosophical Interpretation of Internal Symmetry as Representational Geometry*” PhilArchive preprint (2025). <https://philpapers.org/rec/AXESMG>
Physics version submitted to Foundations of Physics (2025):
Part III: Standard Model Gauge Symmetries from Projection Invariance
- [13] E. Axelkrans, “*A Unified Field Theory as Generative Ontology: Quantum Mechanics, Spacetime, and Gauge Structure as Projection-Level Appearances*” PhilArchive preprint (2025). <https://philpapers.org/rec/AXEAUF>

Physics version submitted to Foundations of Physics (2025):

Part IV: A Unified Field Theory from a Fundamental Generative Equation

- [14] Axelkrans, E. (2025a). *Psychological Dynamics as Coherence Geometry*. Preprint, PhilArchive. <https://philpapers.org/rec/AXEPDA>
- [15] Axelkrans, E. (2025b). *Psychological Development and Reorganization as Coherence Dynamics*. Preprint, PhilArchive. (Present paper) <https://philpapers.org/rec/AXEPDA-2>
- [16] Axelkrans, E. (2025c). *Implications of Coherence Geometry for Psychological Organization*. Philarchive preprint, <https://philarchive.org/rec/AXEIOC>
Manuscript submitted to *Journal of Consciousness Studies*.
- [17] Axelkrans, E. *The Generative Projection Framework - An Ontological Architecture for Physical Reality*. Preprint, PhilArchive (2025). <https://philpapers.org/rec/AXETGP> Submitted to Foundations of Physics.