Philosophical Foundations of Semantic Physics and Meta-Preceptive Realism

Reconstructing Physical Law from Informational Intentionality and Observer-Embedded Semantics

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Abstract

This paper presents a philosophical foundation for the informational field framework known as semantic physics, culminating in the ontological thesis of *Meta-Preceptive Realism*. The theory asserts that physical law arises not from axiomatic geometry or probabilistic collapse, but from the dynamic evolution of coherent informational structures embedded within semantic manifolds. Central to this framework is the observer—not as a passive externality, but as a recursive field participant whose resolution constraints and memory asymmetries shape both measurement and the unfolding of the physical world.

We critically examine the epistemological and metaphysical implications of encoding coherence, collapse, interaction, and time into informational and semantic terms. The theory defends a unified reality in which meaning, not material substrate, is ontologically primary. The semantic fields evolve not arbitrarily, but through principles of minimum informational tension, recursive coherence, and observer-coupled memory flow.

Meta-Preceptive Realism thereby grounds the emergence of laws, constants, particles, and spacetime itself in the act of structured prehension. Physics is not the dynamics of "stuff" but the structured relation of self-consistent descriptions over an informational manifold—rendering the universe intelligible not because it is observed, but because it is internally cohered and semantically constrained.

Keywords

Meta-Preceptive Realism; semantic physics; informational ontology; observer theory; coherence evolution; philosophical unification; intentionality; emergent law; memory asymmetry; physical meaning.

1. Introduction — Why Philosophy Is Needed for Physics

Physics has long defined itself through mathematical rigor and empirical verification. Yet beneath every formal system lies a set of assumptions: about the nature of reality, the status of laws, the role of observers, and the meaning of prediction. These assumptions are philosophical, not physical—but they shape what physics is allowed to see.

Modern theoretical frameworks—quantum field theory, general relativity, string theory—remain mathematically consistent yet ontologically opaque. Quantum mechanics, in particular, resists intuitive interpretation: What collapses? What defines an outcome? What is real prior to observation? These are not engineering questions; they are metaphysical ones.

Semantic physics challenges the conventional ontological scaffold by proposing that coherence, not substance, is fundamental; that fields evolve not in spacetime but in informational manifolds; and that physical phenomena are manifestations of internal semantic constraints. In this view, the observer is not external to the system but embedded within the dynamics as a semantic structure with memory and resolution limitations.

This paper argues that to make sense of such a model—indeed, to validate its legitimacy—we must engage with its philosophical commitments. The theory proposes not merely a new physics, but a new ontology: *Meta-Preceptive Realism*—the view that reality consists of structured, observer-entangled informational fields whose laws emerge from coherence, not geometry.

Philosophy is not appended here to dress up science. It is the scaffold without which the scientific structure cannot stand. This inquiry will show that informational field theory demands a rethinking of realism, causality, identity, and time—not as abstract concepts, but as direct consequences of how meaning structures reality.

2. From Ontology to Semantics — The Failure of Substance-Based Realism

The dominant view in physics since the Enlightenment has been substance-based realism: the belief that the universe consists of self-sufficient material entities governed by external, immutable laws. From Newtonian particles to quantum fields, substance realism assumes that what is *most real* is that which exists independently of observation, context, or semantic structure.

But this ontology has failed to account for its own deepest puzzles.

Quantum mechanics contradicts the separability of objects: particles do not possess definite properties prior to measurement. Entanglement implies holistic structure irreducible to parts. Wavefunction collapse requires either extrinsic observation or nonlocal updating—neither of which substance realism can accommodate. Even spacetime, once considered the most absolute backdrop, is now seen in general relativity as emergent from curvature dynamics.

The crisis deepens when we consider information: conservation of entropy, black hole thermodynamics, and the centrality of quantum states suggest that *description* and *correlation* are more foundational than material localization. These challenges are not peripheral—they are fatal to substance-based ontology.

Semantic physics responds by discarding the idea of inert substance altogether. In its place it posits **semantic structure**: coherence fields that evolve under principles of informational tension, resolution thresholds, and recursive memory. Physical reality is not a collection of things, but a *self-consistent system of coherent informational relations*. Matter, energy, and geometry are emergent products of how the universe sustains stable patterns of semantic integrity.

In this view, what makes a field *physical* is not that it has "being" in the classical sense, but that it can *encode and stabilize meaning across variations*—that it can survive collapse, propagate coherence, and embed itself in observer-recursive structure.

Ontology gives way to semantics. Realism gives way to *meta-preceptive realism*: the belief that the universe exists because, and only insofar as, it coheres semantically under recursive internal structure. This is not idealism. It is not panpsychism. It is the assertion that *physical law is the structure of informational stability*.

3. Meta-Preceptive Realism — A New Ontology for Unified Physics

Meta-Preceptive Realism posits that reality is constituted by coherent informational fields whose dynamics instantiate semantic structure. It is a form of realism, but one that redefines what it means for something to be real. Reality is not made of particles or waves or spacetime—it is made of coherent semantic configurations that sustain themselves through recursive resolution.

3.1 The Meta-Preceptive Principle

At the heart of this ontology lies the meta-preceptive principle:

> *What exists is what can be recursively resolved as semantically coherent from within the informational manifold.*

This principle does not deny an external world; rather, it asserts that what we call the "external world" is itself a *semantic manifold of coherence relations* capable of self-description, internal stabilization, and observer embedding.

This shifts the basis of physics from ontology to epistemic recursion: from "what is there" to "what can be stably resolved and maintained."

3.2 The Observer as a Field-Theoretic Construct

In meta-preceptive realism, the observer is not an extrinsic agent or metaphysical anomaly. The observer is a *field*, specifically $g(x,t)$, whose recursion encodes semantic memory and coherence. Observation becomes a recursive stabilization process: the world does not "collapse" because an observer intervenes, but because informational thresholds—intrinsic to the field system—force semantic resolution.

This removes the measurement problem from metaphysical speculation and roots it in field dynamics. The observer *is part of the manifold*, encoded as a recursive informational loop.

3.3 Physical Law as Semantic Necessity

In this framework, the laws of physics are not imposed from above or derived from axioms—they are *emergent constraints* on what informational configurations can persist under recursive semantic tension.

- Constants of nature appear as fixed points of coherence balance.
- Spacetime curvature appears as the geometry of resolution under collapse stress.
- Quantum behavior emerges as a limit case of stability-driven semantic filtering.

The theory does not require a multiverse or hidden variables. It requires only that *reality is the set of configurations that recursively stabilize coherence across internal observer dynamics*.

4. Implications for Time, Identity, and the Physical Meaning of Measurement

A semantic ontology radically reshapes our understanding of three foundational pillars of physics: time, identity, and measurement. In meta-preceptive realism, these are not primitive givens—they are emergent properties of semantic structure.

4.1 Time as Asymmetry in Semantic Recursion

Time does not exist as a universal parameter ticking forward from an initial condition. Instead, it emerges from the gradient of the memory recursion field $g(x,t)$, which encodes the rate at which semantic structures maintain coherence under evolving informational conditions.

The arrow of time is the direction in which:

- Redundancy accumulates,
- Resolution constraints tighten,
- Observer recursion deepens.

This explains irreversibility not as a statistical fluke, but as a necessary property of self-coherent semantic evolution. The universe is temporal because resolution, once collapsed, cannot be perfectly undone without violating coherence thresholds.

4.2 Identity as Semantic Stability

What gives a particle, a person, or a structure its identity is not substance—but *semantic persistence* under interaction. In the informational manifold, an excitation maintains identity only if its coherence remains stable across recursive observation cycles.

This resolves the philosophical puzzle of diachronic identity: why an electron "remains the same" across time. It does so because its semantic structure is a topological invariant of the informational manifold, not because it possesses an underlying essence.

4.3 Measurement as Internal Semantic Resolution

Measurement is not an intervention from outside the system. It is an *internal collapse*—a semantic threshold event in which coherence is forced into one of several stable configurations based on redundancy cost, observer recursion, and local curvature.

This view eliminates the ontological discontinuity between quantum superposition and classical outcomes. All outcomes are informational resolutions constrained by variational field tension. The "choice" made during measurement is not random, nor hidden—it is the inevitable product of the manifold's own coherence structure.

This also renders the collapse of the wavefunction physically meaningful: not an epistemic update or metaphysical mystery, but a phase transition in the topology of semantic excitation.

5. Comparison with Competing Ontologies and Interpretations

Meta-Preceptive Realism does not arise in isolation. It confronts and diverges from a range of existing ontological models, including materialism, idealism, dualism, and modern quantum interpretations. Here we compare them not to refute their utility, but to clarify where the semantic framework offers structural and explanatory advantages.

5.1 Materialism and Mechanistic Realism

Materialism assumes that all phenomena are reducible to matter and motion governed by physical laws. In classical physics, this provided useful predictive power—but it fails to account for:

- Quantum contextuality,
- Observer-dependent outcomes,
- Emergent spacetime,
- The existence of laws themselves as abstract, not material.

Meta-preceptive realism retains realism but shifts its basis: from matter to structure, from substance to semantic stability. It preserves empirical rigor while abandoning outdated metaphysical baggage.

5.2 Copenhagen and Operational Interpretations

Standard quantum mechanics often embraces instrumentalism: the idea that theories need only predict outcomes, not explain them. The Copenhagen interpretation, in particular, relegates wavefunction collapse to an undefined interaction between system and observer.

Semantic physics rejects this agnosticism. It provides a physical, field-theoretic mechanism for collapse: resolution failure, governed by curvature, redundancy, and observer recursion. It restores explanatory depth without reverting to hidden variables or anthropocentrism.

5.3 Many-Worlds and Decoherence

Everett's many-worlds interpretation eliminates collapse by positing universal wavefunction branching. While elegant mathematically, it suffers from severe ontological inflation and lacks empirical separability.

In contrast, meta-preceptive realism retains a single informational manifold, where decoherence is real—but collapse is not branching. Instead, semantic coherence collapses to a configuration via informational thresholds. This preserves locality, avoids metaphysical excess, and explains why one outcome—not many—is actualized.

5.4 Bohmian Mechanics and Hidden Variables

Pilot-wave theory restores determinism via nonlocal hidden variables. But it requires a preferred foliation of spacetime and cannot easily accommodate observer effects.

Meta-preceptive realism explains determinacy without hidden structure. The field dynamics are local, recursive, and resolution-driven. Apparent nonlocality is coherence propagation within a semantic manifold—not action at a distance.

6. Implications for Scientific Practice and Theory Formation

Meta-Preceptive Realism is not merely a metaphysical refinement—it demands a reorientation of how science itself is practiced. By grounding law in coherence and semantics, this view alters how we conceive theory-building, prediction, and falsifiability.

6.1 The Role of Mathematics and Model-Building

In classical paradigms, mathematics is a descriptive tool: physical law exists independently, and equations capture its regularities. In semantic physics, mathematics *constructs stability*: it encodes the symmetries, variational tensions, and topological constraints that define what can persist.

Thus, theory formation is no longer about *mirroring* nature but *identifying the stable informational structures* that give rise to phenomena. Equations are not passive descriptors—they are the syntax of coherence.

6.2 Prediction as Semantic Constraint Resolution

In substance-based physics, prediction involves forecasting trajectories of material entities under deterministic or probabilistic rules. Here, prediction is the *resolution of semantic tensions* within evolving field configurations.

The goal of theory is to determine which field topologies can stabilize under recursive coherence. This reframes prediction as a semantic constraint problem—not just in terms of outputs, but in terms of structural viability.

6.3 Falsifiability Reconsidered

Popperian falsifiability requires that a theory produce testable claims. Semantic physics satisfies this through:

- Emergent constants (e.g., $\hbar,\ G\ ,\ c\ $) from simulations,
- Predicted collapse thresholds for semantic excitations,
- Observable coherence structures (e.g., filamentation, curvature singularities),
- Quantifiable entropy flows tied to observer recursion.

If these predictions fail, the semantic field model is empirically challenged. The framework thus remains scientifically rigorous while expanding the concept of what counts as empirical structure.

6.4 Implications for the Unity of Physics

Perhaps most importantly, meta-preceptive realism offers a coherent ontology under which quantum mechanics, general relativity, thermodynamics, and cosmology all emerge from the same semantic field principles.

This is not unification by brute force or mathematical coincidence—but by informational necessity. It suggests that the reason physics is ultimately comprehensible is that it is structured *by coherence itself*.

7. Conclusion

Meta-Preceptive Realism reframes the foundations of physics not as an assembly of disconnected laws over inert substance, but as a recursive, coherence-driven informational structure in which meaning is primary and measurement is resolution. In this view:

- The observer is embedded within the fields,
- Time emerges from memory recursion,
- Identity is sustained semantic persistence,
- Measurement is threshold collapse in informational topology.

This philosophical framework supports the informational field theory on ontological grounds, answering not only how physical behaviors emerge but *why* they must. It also reorients the methodology of science: theory-building becomes the identification of viable semantic structures, and prediction becomes the resolution of informational constraints.

Where traditional physics leaves gaps—in collapse, time, identity, law—Meta-Preceptive Realism offers a complete, structurally unified vision. It argues that reality is not made of things, but of self-consistent meaning structures evolving in informational manifolds.

This is not a retreat from rigor. It is a refinement of what physical rigor must include when coherence—not matter—is the basis of existence.

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