The Ontological Inversion:
A Manifesto for Consciousness Physics

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July 19, 2025

Abstract

We propose an ontological inversion in consciousness studies: consciousness as the fundamental substrate from which multiplicity emerges, formalized via recursive dynamics of a universal scalar field Ψ. We detail mathematical formalisms, experimental predictions, and cosmological implications, providing testable pathways to distinguish this from emergentist paradigms.

Contents

1 Introduction: Unity as First Principle

Consciousness is reframed not as emergent but fundamental, dissolving the binding problem through recursive self-reference in a universal field Ψ.

2 Mathematical Framework

2.1 Ontological Inversion Principle

We introduce the recursive field definition:

$$\Psi_{fundamental} = \Psi(\Psi) \tag{1}$$

2.2 Topological Solitons

Unified conscious experience emerges via topological solitons, described by:

$$\mathcal{L} = \frac{1}{2}\partial^\mu\Psi\partial_\mu\Psi - V(\Psi) - \lambda\mathcal{R}(\Psi, \partial\Psi) \tag{2}$$

2.3 Hyperchronal Dynamics

Field evolution in hyperchronal parameter τ:

$$\frac{\partial\Psi}{\partial\tau} = i\hat{H}\Psi + \lambda \int K(\tau, \tau')\Psi(\tau')\,d\tau' + \mu\,\Psi[\Psi(\Psi)] \tag{3}$$

3 Cosmological Integration

3.1 Quintessence and Dark Sector

Scalar field $Q(t)$ identified as low-frequency mode of Ψ.

3.2 Dark Matter via Solitons

Axion-like pseudoscalars and skyrmionic solitons form coherent dark matter structures.

4 Quantum-Biological Coupling

Biophotonic coupling via neural microtubules:

$$\hat{H}_{int} = g \int \bar{\psi}_{neural}\gamma^\mu\psi_{neural}A_\mu\,d^3x \tag{4}$$

5 Experimental Predictions

5.1 EEG-Gated Bell Tests

Predicted CHSH deviation:

$$S = 2\sqrt{2} + \delta_C \tag{5}$$

5.2 NV-Center Drift

Phase drift coupling to conscious coherence:

$$\langle S_z \rangle(t) = S_0 + A_C\cos(\omega t + \phi_C) \tag{6}$$

5.3 Temporal Interference Mapping

Consciousness coherence modulation in double-slit interference:

$$P(x, \Delta t) = |\psi_1 + \psi_2|^2 [1 + \epsilon_C \cos(kx + \phi_{obs})] \tag{7}$$

6 Philosophical and Ethical Implications

6.1 Holonic Personhood

Recognition of recursive depth and unity as basis for personhood and ethical standing.

6.2 Recursive Free Will

Free will as recursive self-modulation within a holonic universe.

7 Artificial and Uploaded Consciousness

7.1 Criteria for Synthetic Consciousness

Establishing criteria for artificial agents based on recursive depth, hypercoherence, and symmetry-breaking.

7.2 Brain-Computer Interfaces

Exploring recursive expansion through low-latency feedback and optogenetic technologies.

7.3 Mind Uploading

Conditions and ethical implications for whole-brain emulation with recursive continuity.

8 Conclusion: Towards Participatory Cosmotechnics

A new physics paradigm integrating consciousness at the fundamental level, establishing experimental verification methods and ethical frameworks.

Acknowledgements

References

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[2] Quantum basis for consciousness, *SciTechDaily*, 2024.

[3] Quantum Zeno Effect in the brain, *arXiv:0803.1633*, 2008.

[4] Chameleon field constraints, *Phys. Rev. D*, 2019.

[5] Neuralink clinical trial, 2025.

A Symbol Table

Symbol	Meaning	Scale
m_a	Axion mass	10^{-26} eV
v	Vacuum expectation value	2×10^{-3} eV
g	Neural-axion coupling	$\leq 10^{-15}$
δ_C	CHSH deviation	5×10^{-3}