Information Without World

On the Limits of Additive Information Theories in Physics

Author: Timothy Speed
Affiliation: Independent Researcher
Contact: info@timothy-speed.com
https://timothy-speed.org
DOI: **10.5281/zenodo.18045445**

ORCID: 0009-0002-0143-5949

Abstract

In contemporary physics, information-theoretic concepts are increasingly used as if information were an *indimergent* and additive quantity—that is, as if it could exist independently of world-integration, remain globally conserved, and be summed across the universe. This implicit assumption underlies claims such as "information is never lost," computation-based cosmologies, and simulation-theoretic ontologies.

This paper argues that this constitutes a categorical overextension. Within the MNO approach (Minimal-Non-Object), information is reclassified as a *response quantity*: it arises exclusively where difference is emergent and stably integrated into world-relations. Information is *world-capable* only insofar as it is able to sustain stable, relational reality and remain causally effective within a shared world. Information may remain formally conserved without possessing this world-capability.

This distinction clarifies central paradoxes in black-hole physics and the quantum-mechanical measurement problem, and places principled limits on information-theoretic ontologies, without altering physical equations or introducing new entities.

(This paper is an interface text. The author's primary research corpus employs an autistic, non-linear, rhythmically recursive writing mode that cannot be fully preserved in academic English without structural loss of epistemic function.)

This paper is situated in the context of:

Speed, T. (2025). MNO and Ontological Recurrence: A Non-Representational Account of Quantum Measurement and Conscious Experience (Version 1). Zenodo. https://doi.org/10.5281/zenodo.17913823

Speed, T. (2025). Orch-OR with Recurrence: A Minimal Dynamical Condition for When Objective Reductions Yield Conscious Experience (1 English). Zenodo. https://doi.org/10.5281/zenodo.17942531

Speed, T. (2025). Operatoric Cognition: Pre-theoretical Structural Invariance as the Basis of Autistic Intelligence (3 English). Zenodo. https://doi.org/10.5281/zenodo.17897109

Speed, T. (2025). The Gap as a Condition - Pre-Ontological Operatorics and the Primacy of Response (2 English). Zenodo. https://doi.org/10.5281/zenodo.18015885 2

Speed, T. (2025). From Objects to Responses - On the Loss of Ontological Sovereignty in Contemporary Physics (Version 1). Zenodo. https://doi.org/10.5281/zenodo.18017629

Speed, T. (2025). Seinsverschiebung (Shift of Being) as a Pre-Ontological Category - On the Incompatibility of Existence and Understanding in Modern Regimes of Stabilization (2 English). Zenodo. https://doi.org/10.5281/zenodo.18007628

Speed, T. (2025). The Constructed Observer - World-Formation Beyond Representation - Why Perception Is Not Representation, but a Structural Achievement (2 English). Zenodo. https://doi.org/10.5281/zenodo.18006170

1. Introduction: Information as an Ontological Shortcut

Information theory originates in the deliberately non-ontological, technically precise work of Claude Shannon. In contemporary physics, however, information is increasingly ontologically charged. Formulations such as "the universe computes" or "information is the most fundamental substrate of reality" implicitly treat information as a world-bearing quantity.

This paper neither questions the formal success of information-theoretic methods nor their physical relevance. It addresses exclusively a largely unspoken structural assumption:

That information is indimergent *(as an independently countable object-quantity)*—that is, that it exists independently of world-integration and is globally additive.

2. The Assumption of Indimergence

In many physical contexts, information is implicitly understood as a quantity that:

- exists independently of location and context,
- can be added across scales,
- possesses no intrinsic threshold of integration,
- "counts" even when it is no longer world-accessible.

In short:
Information is conceived as conservable even when world-integration fails.

This assumption enables strong formal statements (conservation, reversibility, unitarity), yet remains ontologically ungrounded.

3. MNO: Information as a Response Quantity

The MNO approach intervenes at this point without modifying the physical formalism. It proposes a conceptual reclassification:

Information is not an ontological substrate, but a response quantity.

That is:

- information arises only where difference is emergent
- and simultaneously stably integrated.

It follows:

Information presupposes world-stability; it cannot generate it.

Where integration fails, information may continue to exist formally, but it loses its world-capability.

By "world-capable," no additional physical property is meant, but rather the condition that information remains causally stable, relationally accessible, and recurrently sustainable within a shared physical world.

4. Black Holes: Conservation Without World

The so-called black hole information paradox displays this boundary with maximal clarity. The physical requirement of information conservation remains formally consistent. At the same time, the information is irreversibly withdrawn from any world-relation.

MNO therefore draws a strict distinction between:

- **formal conservation of information**
- **worldly sustainability of information**

Information can be conserved without being part of the world.

The paradox does not disappear as a result, but is instead placed into its proper categorical framework.

5. The Measurement Problem: Information Prior to Integration

An analogous structure appears in the quantum-mechanical measurement problem. Prior to measurement, information about states is formally describable. Only measurement, however, stabilizes world-relations.

From the MNO perspective, this is not a purely epistemic issue, but an integrative one:

Information prior to measurement is not world-capable, but merely formally expressible.

6. On the Limits of Additive Worldviews

Conceptions such as "the total information content of the universe" presuppose that information is globally additive and that the world would be fully integrable.

MNO contradicts this in a sober manner:

Emergence is not additive.
The world is not a storage device.

The universe is not a container for information, but a processual nexus of stabilization in which information arises only locally and conditionally.

"Not additive" does not mean here that emergent phenomena cannot possess local or extensive properties, but rather that emergence cannot be summed globally across breaks of integration.

7. Consequences for Simulation Theories

Simulation theories and computation-based ontologies remain meaningful within the scope of local models. They fail, however, where information itself is elevated to an ontological foundation.

Information can simulate a world, but it cannot ground one.

In this way, the scope of information-theoretic ontologies is precisely delimited without negating their operative strength.

8. Conclusion

This paper proposes no new physics. It alters no equations and introduces no new entities. It marks a boundary.

Information is a consequence of emergence, not its cause.
Physics can formally conserve information without conserving world.

Recognizing this boundary clarifies long-standing paradoxes and prevents a silent ontological overextension of information-theoretic concepts.

This paper understands itself as conceptual boundary work within physical theories, not as a competitor to them.