Title
Faraday, Higgs, and the Minimal Ontologic Concept: Reassessing the Foundations of a Unified Physical World

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Abstract

Modern physics still operates with an implicit duality between a “classical world” and a “quantum world”, as if nature were divided into two incompatible regimes. This conceptual split, inherited from historical developments rather than grounded in ontology, obscures the continuity of the physical world and generates persistent ambiguities—particularly concerning the nature of the vacuum and the interpretation of the Higgs mechanism.
In this article, I introduce the **Minimal Ontologic Concept (MOC)**, defined as the minimal, irreducible presence that prevents space from being an absolute void. The MOC is not a substance, not a field, not a medium, and not a quantum state; it is the minimal condition for existence itself. I show that Faraday was the first to articulate the necessity of such a presence, whereas the Higgs mechanism, despite its mathematical utility, has no ontological significance.
I further show that the **O-System** (Bohane, 2026, submitted) provides a quantitative framework consistent with a unified world, replacing mass with a universal measure of existence expressed in O-units. This reformulation eliminates the artificial separation between classical and quantum regimes and restores coherence between ontology and physical description.

Recognizing the MOC allows physics to abandon the fiction of two worlds and to adopt a unified ontological foundation compatible with both Faraday's intuition and modern theoretical structures.

Keywords

Minimal Ontologic Concept; Faraday; Higgs mechanism; unified ontology; quantum vacuum; O-System; mass; physical foundations.

0. Essential Definition: Minimal Ontologic Concept (MOC)

The *MOC* is defined as the minimal, irreducible ontological presence that prevents space from being an absolute void. The MOC is not a substance, not a medium, not an ether, not a specific field, and not a quantum state in the formal sense. It is the minimal condition for existence: *that which is present rather than nothing*.

This minimal presence is indispensable for the existence of physical phenomena: without the MOC, no field—magnetic, electric, or quantum—could exist or manifest. Likewise, no interaction, propagation, or space-time geometry could be defined in the absence of this ontological layer.

Faraday was the first to explicitly recognize this necessity when he wrote that "something exists in space that transmits influence." Modern physics, through the non-trivial structure of the quantum vacuum, confirms the need for such a minimal ontological layer, even though it has never been formally named.

The MOC thus provides the unified ontological foundation required for describing a single, continuous physical world.

1. Introduction: Leaving the Two-World Paradigm

For more than a century, theoretical physics has operated under an implicit division between two supposedly distinct domains: a "quantum world" governed by fields and amplitudes, and a "classical world" governed by masses, trajectories, and forces. This dichotomy, inherited from the history of ideas rather than from physical necessity, has become a conceptual reflex. It still shapes models, interpretations, and pedagogical narratives.

Yet this separation has no ontological justification. It is a conceptual habit, not a property of nature.

In a recent manuscript (Bohane, 2026, submitted), the **O-System** demonstrates that this division is unnecessary. By replacing mass with a universal measure of existence expressed in O-units, it reveals that there is **only one world**, continuous and unified, with no rupture between so-called "classical" and "quantum" scales. The resulting numerical values—such as 1012 O-units cubed to represent one kilogram—are not anomalies but the natural expression of the dimensional spectrum of a unified world. These large numbers simply reflect the continuity of reality.

If the world is unified, it must rest on a **single minimal ontology**. There cannot be a "classical vacuum" on one side and a "quantum vacuum" on the other. There cannot be two kinds of space, two kinds of presence, or two kinds of reality.

This necessity motivates the explicit introduction of the **Minimal Ontologic Concept (MOC)**, defined above. The MOC replaces the notion of vacuum and provides the minimal presence required for fields, interactions, and geometry to exist.

Leaving the two-world paradigm is therefore not an aesthetic choice but a conceptual necessity for restoring coherence to physics.

2. Conceptual Framework: Why a MOC Is Necessary

Modern physics relies on entities—fields, interactions, geometry—that cannot exist or propagate in an absolute void. Yet scientific language continues to use the word “vacuum” as if total absence were a physical possibility. This contradiction reveals a deep conceptual inconsistency.

The “classical vacuum” is a mathematical abstraction. The “quantum vacuum” is not a vacuum: it has structure, energy, fluctuations and correlations. Fields do not float in nothingness: they require a minimal ontological support. Even space-time geometry cannot be defined without a minimal presence that gives it consistency.

Thus, physics already uses an implicit minimal ontology without naming it. It speaks of “vacuum” while describing a presence; it speaks of “nothing” while calculating measurable effects.

The **MOC** makes explicit what physics has long relied upon implicitly. It adds nothing to physical theory; it clarifies the ontological foundation that theory presupposes.

With this clarification, we can reinterpret Faraday's insights and reassess the true scope of the Higgs mechanism.

3. Faraday: The First to Formulate the MOC

Long before quantum theory, Faraday recognized that space cannot be a void. In his *Experimental Researches in Electricity*, he insisted that lines of force are not geometric abstractions but physical realities existing in space, even in the absence of matter.

Faraday did not propose a mechanical ether or a material substrate. He proposed a **minimal presence**, necessary for electromagnetic phenomena to exist. He rejected the idea of empty space because an absolute void could not support influence or propagation.

His intuition anticipated:

- the non-trivial structure of the quantum vacuum,
- the need for a minimal ontological support for fields,
- the continuity of the physical world,
- the impossibility of a true void.

Faraday thus articulated, in conceptual form, what we now call the **MOC**. Modern physics has rediscovered his insight through more technical means, but without naming the underlying ontological necessity.

4. The Higgs Mechanism: A Formal Adjustment Without Ontology

The Higgs mechanism is often presented as explaining the origin of mass or as filling space with a universal medium. These interpretations are inaccurate.

In his 1964 paper, Higgs did not propose an ontology of the world. He proposed a **formal solution** to a mathematical constraint: gauge symmetry forbids explicit mass terms for the W and Z bosons. Introducing a scalar field with a non-zero vacuum expectation value allows mass terms to appear without breaking the symmetry explicitly.

The Higgs mechanism is therefore:

- an internal adjustment,
- within a human-constructed Lagrangian,
- expressed in human units,
- producing a human quantity: mass.

It does not describe the structure of space, the minimal presence, or the reason anything exists. It has **no ontological content**.

In a unified world grounded in the MOC, the Higgs mechanism is recognized as a formal device, not a description of reality.

5. The O-System: Beyond Mass and Back to a Unified World

Mass is not a fundamental property of matter. It is a human translation of a deeper quantity of existence, expressed in

O-units. **Among the seven SI base quantities, mass is the only one that is not grounded in an ontological feature of the physical world. It is defined by human convention rather than by a primitive property of nature.** This makes mass unique within the SI: it is indispensable for engineering and measurement, yet ontologically arbitrary.

The O-System replaces mass with a universal measure of existence, independent of matter, volume, or composition. Large numerical values—such as 10^36 O-units for one kilogram—are not problematic. They reflect the true dimensional spectrum of a continuous world.

The O-System:

- eliminates mass as a fundamental quantity,
- replaces it with a universal measure of existence,
- unifies classical and quantum scales,
- aligns quantitative description with the MOC,
- restores ontological coherence.

In this framework, the Higgs mechanism cannot be interpreted as explaining mass. It merely converts a coupling into a human quantity. The O-System expresses existence directly, in a unified ontology.

6. Discussion: Faraday, MOC, and Modern Physics

Modern physics implicitly relies on the MOC. The quantum vacuum has structure; space-time has dynamics; fields require a support. Yet the language of “vacuum” persists, creating confusion.

Faraday identified the minimal presence explicitly. The MOC names it. The O-System quantifies it.

Together, they reveal that physics has always been describing a unified world, even while speaking as if two worlds existed.

Recognizing the MOC resolves longstanding ambiguities and aligns ontology with physical theory.

7. General Conclusion

The two-world paradigm—classical versus quantum—has no ontological basis. It is a historical artifact that obscures the continuity of the physical world.

By introducing the **Minimal Ontologic Concept (MOC)**, we clarify the minimal presence required for fields, interactions, and geometry to exist. Faraday articulated this necessity; modern physics confirms it; the O-System operationalizes it.

The Higgs mechanism, while mathematically useful, has no ontological significance. It does not describe the structure of space or the origin of existence.

Recognizing the MOC allows physics to abandon the fiction of two worlds and adopt a unified ontological foundation consistent with both Faraday's intuition and contemporary theoretical structures.

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References

- Bohane, W. (2026). *The O-System: A Unified Quantitative Framework*. Submitted manuscript.
- Faraday, M. (1831–1855). *Experimental Researches in Electricity*.
- Higgs, P. W. (1964). "Broken Symmetries and the Masses of Gauge Bosons." *Physical Review Letters*.
- Standard references in quantum field theory and general relativity (Weinberg; Peskin & Schroeder; Misner–Thorne–Wheeler).
- Maxwell, J. C. (1873). A Treatise on Electricity and Magnetism. Oxford: Clarendon Press.
- Peskin, M. E., & Schroeder, D. V. (1995). An Introduction to Quantum Field Theory. Westview Press.
- Weinberg, S. (1996). The Quantum Theory of Fields, Vol. II: Modern Applications. Cambridge University Press.