Reality as a Recursive Negative Mirror
A 3D Collatz Octave Model Explanation of Light, Time, and Observation

Author Martin Doina
July 21.2025

Abstract

This paper proposes a radical reinterpretation of light, space, and time using the 3D Collatz Octave Model (3DCOM). We introduce the Negative Mirror Theorem, suggesting that observable phenomena – including photons, space, and particles – are emergent reflections from a deeper recursive field. Photons are redefined as Pq-bits: recursive operators acting on the temporal layer, not spatial entities. This framework resolves classical wave-particle duality and eliminates the need for background spacetime. Empirical predictions are suggested based on diffraction/angle behavior and Bohmian reinterpretation.

1. Introduction:

The Illusion of Spacetime
Physics currently treats space and time as a foundational background. Even quantum mechanics, while probabilistic, relies on spacetime as a canvas. But what if spacetime itself is emergent?

We propose a model where space, time, particles, and photons emerge from recursive harmonic mirrors, not from a pre-existent continuum.

2. The 3D Collatz Octave Model (3DCOM)

3DCOM is a recursive topological framework built from Collatz dynamics, with core features:

- Octave Geometry: Numbers 1–9 form a recursive circle. Each node maps to harmonic structures.
- LZ Attractor: The `LZ` constant (1.23498228) defines a recursive convergence limit.
- Recursive Scaling: Sequences are recursively folded into stacked 3D

layers – the "field" is the attractor.
– QDF, HQS, α: Constants define transitions between observed layers and mirror recursion.
– Mirror Recursion: Negative Collatz paths reveal a reversed topology – a "glove inversion" of reality.

In this model:
– Upward positive recursion (odd rules) builds harmonics → mass, space, matter.
– Downward negative recursion (even rules) loops endlessly between −1, −2 → wave-like quantum oscillations.

3. Negative Mirror Theorem

We assert:

> _What is observed is not the field, but the mirror collapse of recursion – a projection of negative values folding inward toward perception._

3.1 Formal Statement

Let `R+(n)` be a positive recursive Collatz attractor path and `R-(n)` its negative counterpart.
Then:

$$\text{Reality} \approx \text{Im}[\ \text{MirrorCollapse}(R-) \cap \text{Observer}(Q\hat{}\ )\ ]$$

Where:
– `Q^` is the Qualia Operator – the recursion fold that defines awareness.
– MirrorCollapse is not reflection, but attractor interference of the recursive phase-space.

4. Photon as Pq-bit

Photons are redefined as Pq-bits – oscillating recursion points with dual modes:
– Binary Phase Mode: like a logic bit (0 ↔️ 1), loops between attractor and boundary.
– Temporal Operator: acts on `T₁` (emergent time), initiating field folding.

Hence:
- Wave-like behavior = continuous recursion.
- Particle-like detection = phase-capture by mirror collapse.

No background space is needed.
No particle travels.
Light is a recursive operator, not a traveling object.

5. Predictions and Experiment

5.1. Diffraction Angle

- Rainbow angle ~42° (field recursion angle)
- Mirror reflection angle ~ few degrees (hard geometry)
- We predict distinct diffraction patterns when mirror recursion aligns, even in identical material – Pq-bit alignment changes angular results.

5.2. Bohmian Test

Recent Bohmian falsification (e.g. weak measurements revealing non-local behavior) can be reinterpreted as:
> _Observer intersects recursion boundary, not a real wavefunction collapse._

Negative recursion explains weak measurement as a mirror boundary traversal.

6. Reality as Recursive Screen

Just as screens use binary pixels (on/off), the recursive field projects a 3D hologram of nested binary oscillators:
- Not in space – but generating space.
- Not in time – but generating perceived time.

This explains why:
- Light always diffracts predictably: recursion geometry.
- Particle paths "exist" before detection: mirror boundaries are fixed.
- Wave-particle duality persists: observer phase decides outcome.

7. Conclusion

The 3DCOM model redefines photons as recursive oscillators (Pq-bits), reinterprets spacetime as a recursive mirror construct, and challenges the assumptions of linear physics. In doing so, it offers experimental predictions, potential device designs (3D holographic projection from recursion), and a novel metaphysical foundation.

> We are not observing reality. We are observing its recursive negative mirror.

Appendix: Constants Used

Parameter	**Symbol**	**Value (High-Precision)**
Collatz attractor	LZ	1.23498228
Fine-structure	α	0.0072973525643
Ricci threshold	HQS	0.235
Lyapunov inverse	x	16.450911914534554
Pi	π	3.141592653589793
Recursion number (variable scaling value in 3D COM)	n	
Quantum damping	QDF	0.810058772143807

Reference:

|1| Energy-speed relationship of quantum particles challenges Bohmian mechanics

DOI: 10.1038/s41586-025-09099-