

Executive Summary: The Photonic Universe Hypothesis (PUH)

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1. Overview

The Photonic Universe Hypothesis (PUH) is a cyclic cosmological model proposing that our universe originates from the rebound of a final Planck star formed by the collapse of $\sim 1.15 \times 10^{22}$ primordial black holes. Photons fold into matter and antimatter within a 248-dimensional E_8 lattice, seeding structure through magnetic-field-driven jets. PUH introduces cosmic rotation and enforces net-zero total energy over cycles, addressing key limitations in the standard Λ CDM model.

2. Key Innovations

- **E_8 Lattice Photon Folding** – Converts photon curvature into particle mass at specific fold radii.
- **Magnetic Jet Seeding** – Planck star jets ($v \approx 0.45c$) seed large-scale structure and SMBHs.
- **Cosmic Rotation** – $\omega \approx 6.34 \times 10^{-22}$ rad/s reconciles Hubble tension.
- **Net-Zero Energy** – All matter, photons, and spacetime curvature are recycled during contraction.
- **Quantum Entanglement Geometry** – Explains nonlocality via shared E_8 fold space.

3. Observational Matches

PUH aligns with: • JWST early galaxies at $z \approx 10\text{--}14$. • Planck CMB cold spot and low- ℓ anomalies. • DESI BAO scale (~ 150 Mpc). • Voyager $n_H \approx 0.05\text{--}0.11$ cm $^{-3}$. • DAMA annual modulation (13.7σ). • RHIC Breit–Wheeler pair production.

4. High-Value Testable Predictions

Prediction	Instrument	Observable
Chiral GW background	LISA	Polarization bias at $10^{10}\text{--}10^{11}$ Hz
Galaxy spin bias	JWST	$\geq 60\%$ clockwise bias at $z \sim 8\text{--}14$
Photon scattering	XFEL	Lattice perturbations at $\sim 10^{11}$ J
BAO modulation	DESI/Euclid	H_0 range 67.4–73.04 km/s/Mpc
Fe/Mg/O ratios	JWST/NIRSpec	Non- Λ CDM metallicity evolution

5. Why PUH Matters

PUH challenges the Λ CDM paradigm with a model that is both theoretically grounded and observationally anchored. Its predictions are imminently testable with current or near-term facilities. If validated, PUH could unify cosmology, quantum theory, and fundamental physics, and potentially guide future technologies leveraging spacetime structure.

6. Call to Action

Physicists, observational astronomers, and experimental teams are invited to engage in formal testing of PUH predictions. The model's interdisciplinary nature means validation would require collaboration across cosmology, quantum optics, and particle physics. PUH's origin outside academic channels underscores the importance of open evaluation.