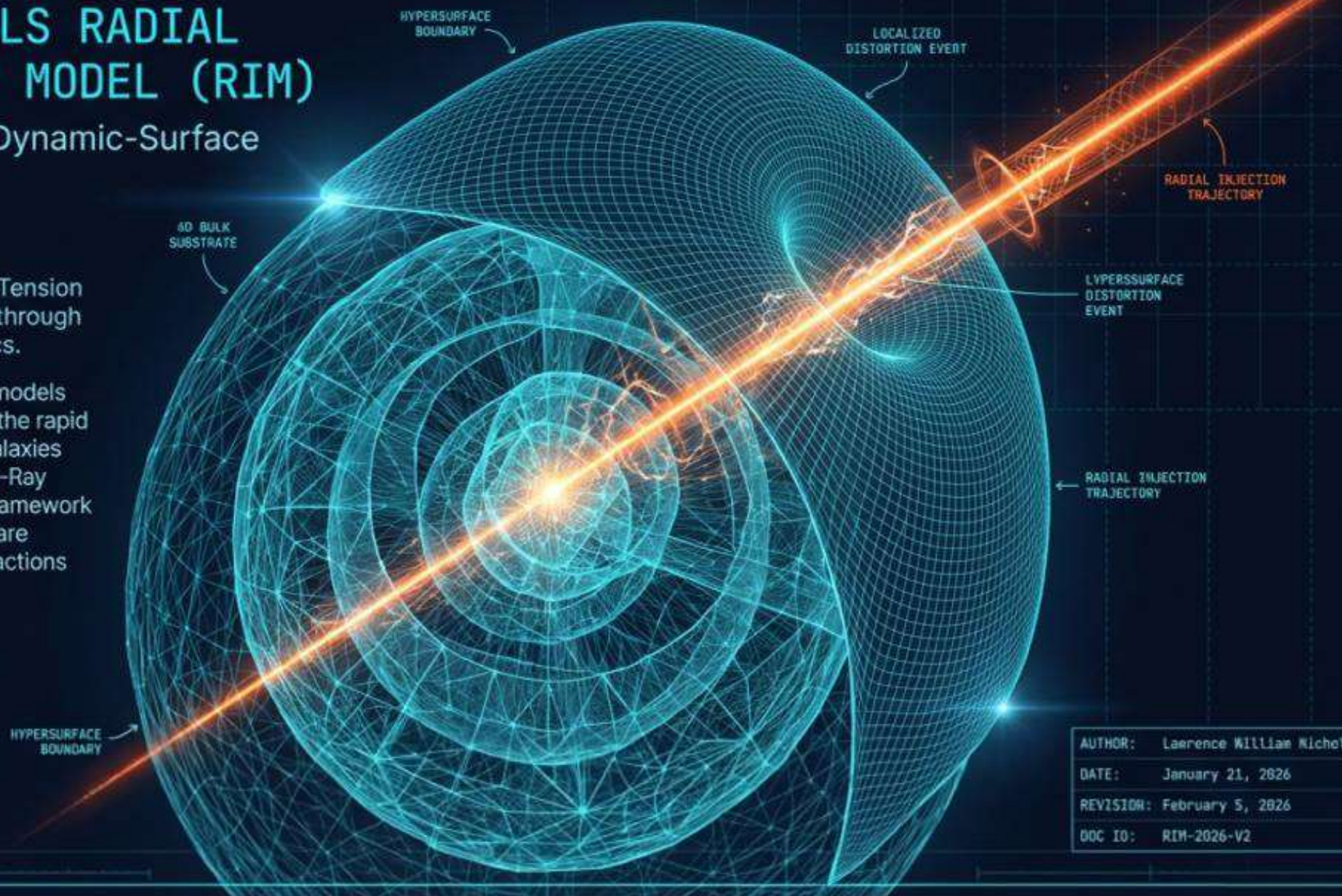


THE NICHOLS RADIAL INJECTION MODEL (RIM)

A Static-Bulk / Dynamic-Surface Cosmology

Resolving the Hubble Tension and JWST Anomalies through 4D Manifold Mechanics.

Current Lambda-CDM models struggle to account for the rapid formation of massive galaxies and hours-long Gamma-Ray Bursts. We propose a framework where "Dark" variables are actually structural interactions with a 4D substrate.



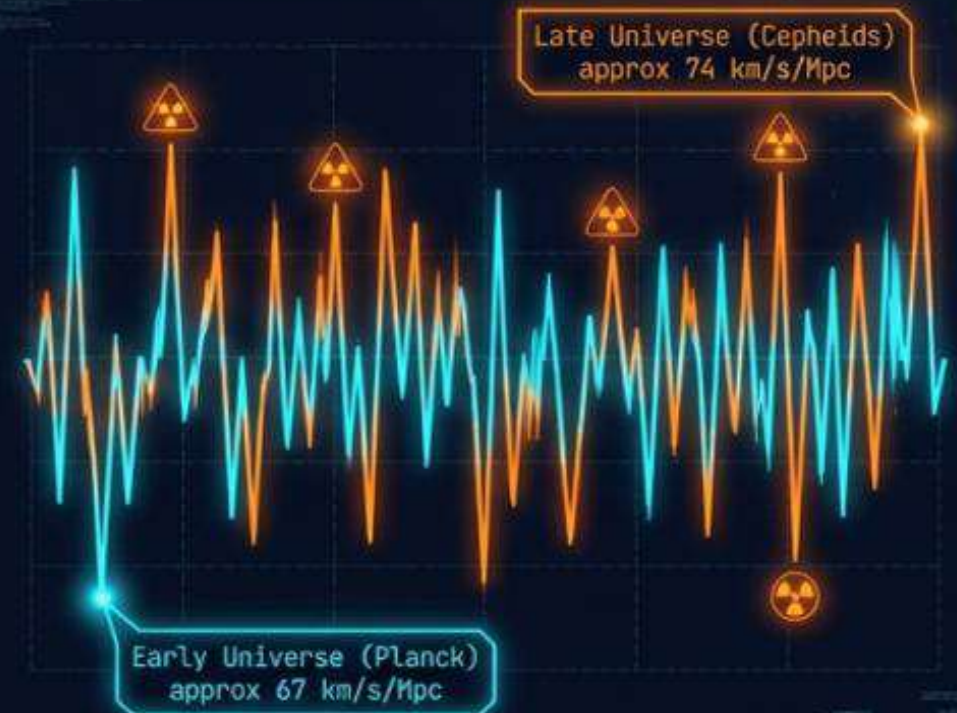
AUTHOR:	Laurence William Nichols
DATE:	January 21, 2026
REVISION:	February 5, 2026
DOC ID:	RIM-2026-V2

The Crisis is a Signal: The Hubble Tension is Not an Error

Standard Model Expectation (Lambda-CDM)



Observed Reality (Data)



The **Standard Model** views these discrepancies as **instrumental noise**. RIM views this “jitter” as the **universe's physical heartbeat**—a mechanical response to mass-energy inflows.

The Impossible Objects: JWST Anomalies

Standard Timeline (13.8 Gyr)



RIM Timeline (16.6 Gyr)



Key Concept: Island Births

These structures didn't evolve from scratch; they were erupted via massive radial injections.

THE GEOMETRY OF THE 4D HYPERSPHERE

3D HYPERSURFACE

4D BULK

8.076 Billion Light-Years

TRANSVERSE WIDTH
(SAFETY BUFFER) = 10^{10} ly

SYSTEM SPECS

CURVATURE SIGNAL (OMEGA_K):
0.004

TOTAL DIAMETER:
approx 1.47 Trillion Light-Years

SCALING CONSTANT:
0.1333

NOTE: CURVATURE IS A PHYSICAL
TRACK, NOT AN ERROR.

CURVATURE SIGNAL (OMEGA_K)
(OMEGA_K):
0.004

TOTAL DIAMETER:
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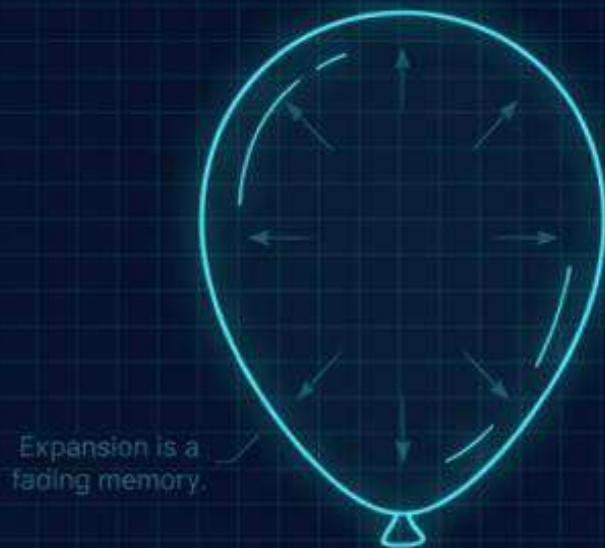
NOTE: CURVATURE IS A PHYSICAL
TRACK, NOT AN ERROR.



SHIFT 4: COSMOLOGY - NOT JUST HISTORY. A BLUEPRINT FOR A SELF-REGULATING MECHANISM (R^4).

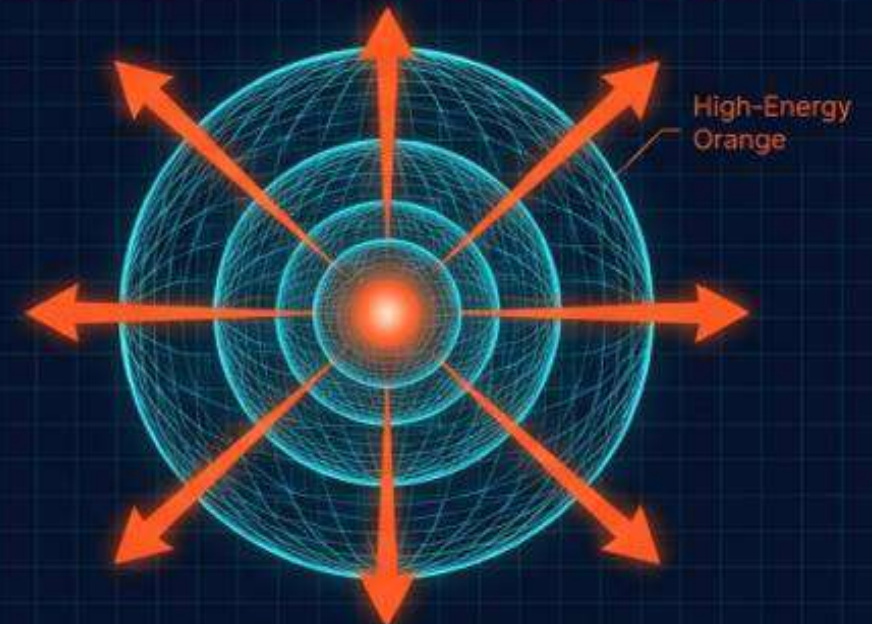
From a Fading Ember to a Living Engine

PASSIVE DRIFT (The Big Bang Inertia)



Expansion is a fading memory.

ACTIVE INJECTION (Radial Impulse)



Expansion is a driven variable.

Expansion

Not constant. Driven by
Inflationary Pressure (R^4).

Gravity

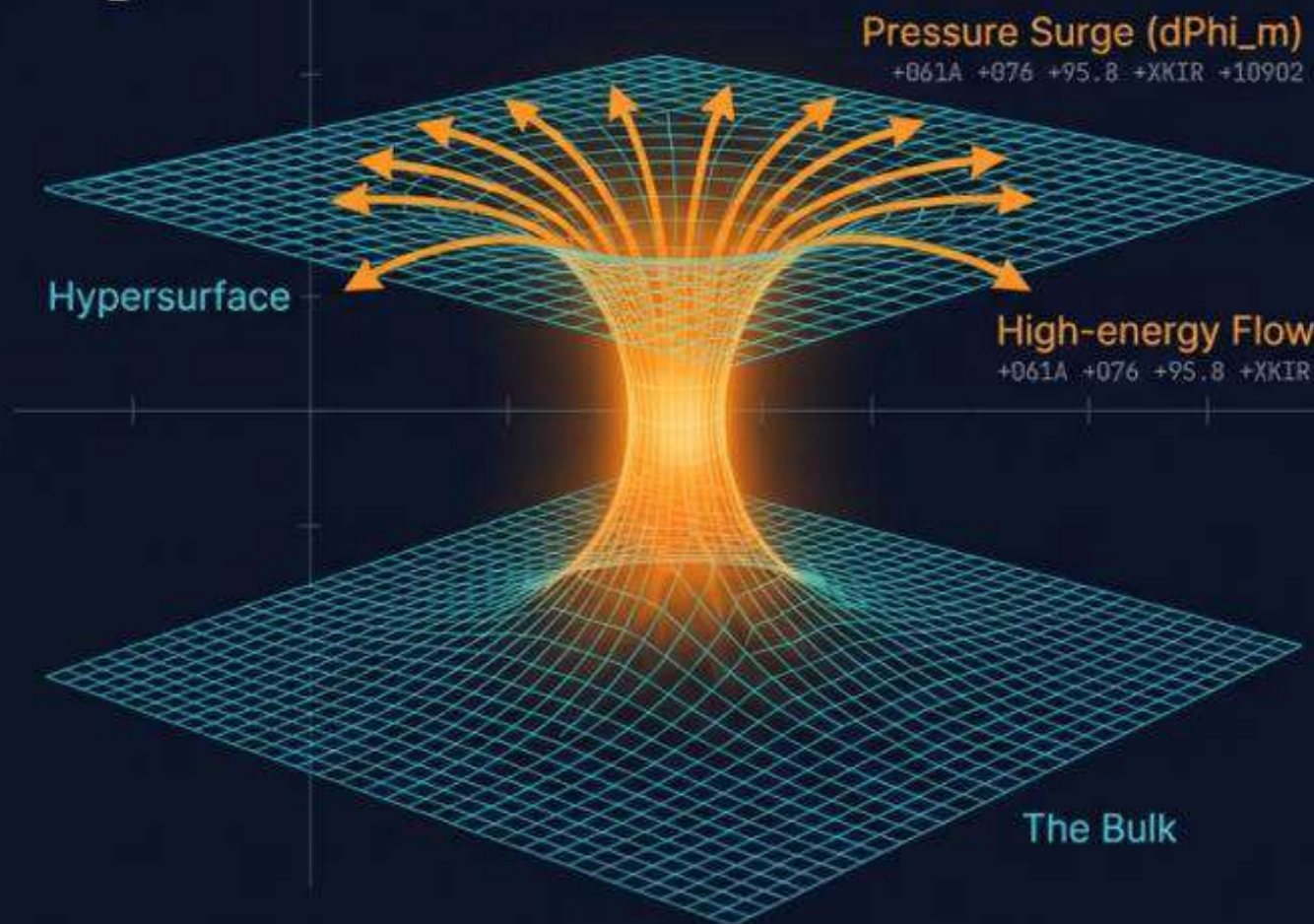
Not just curvature. The manifold seal
resisting 4D bulk pressure (P_B).

Black Holes

Not dead ends. **Sequestration Drains**
recycling matter to the bulk.

The Mechanism: Radial Mass Injection via Einstein-Rosen Bridges

1. **TRIGGER:** 4D matter-antimatter interactions in the bulk.
2. **INJECTION:** A transient Einstein-Rosen Bridge (ERB) punctures the manifold.
3. **RESULT:** Localized pressure surges force the 3D surface area to increase to maintain equilibrium.



Progenitor-less Astrophysical Events are pure injection events from the bulk.

Gamma-Ray Bursts as Manifold Punctures

In-Situ Stellar
Augmentation

The "Little Red Dot" Solution

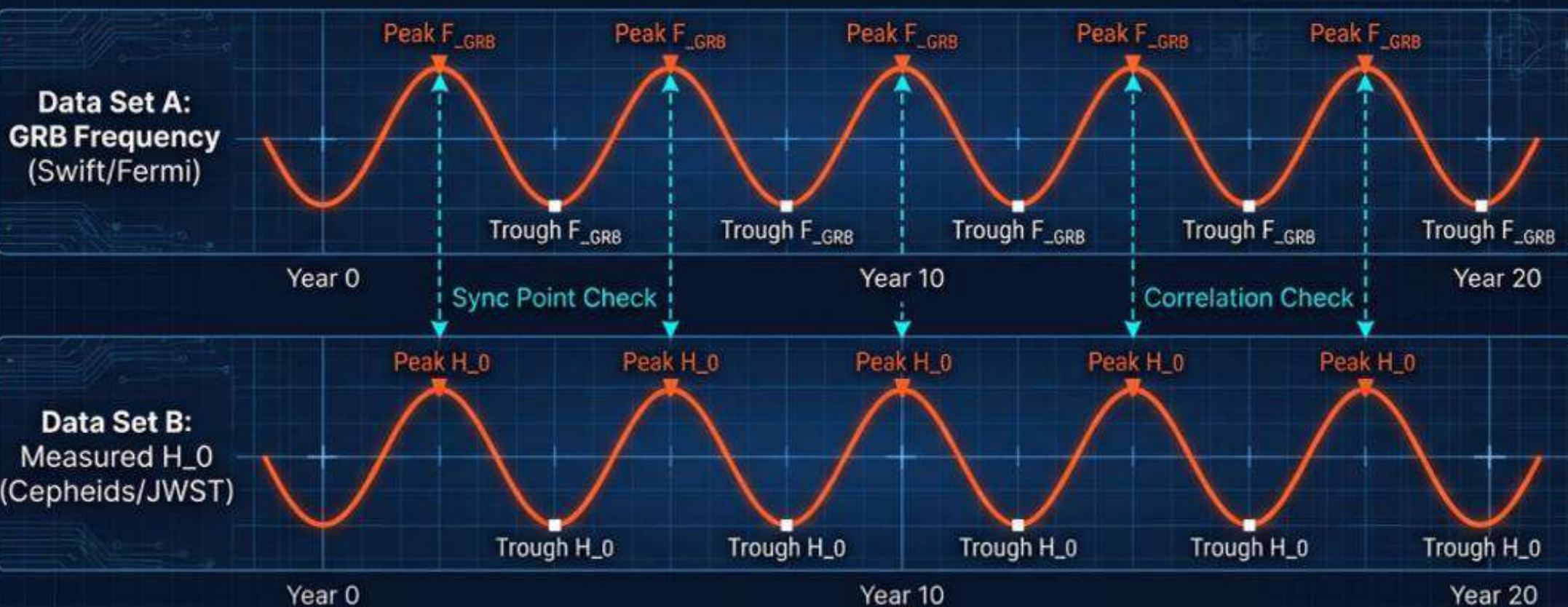
- JWST sees stars at z approx 7.3 that are too massive for their age, violating Eddington luminosity limits
- **RIM Explanation:** These stars are being augmented. Radial mass flux acts as a secondary fuel source.
- **Conclusion:** High GRB activity = High Injection = High Expansion.

Wormhole Tunnel
(Injection Channel)

The 20-Year Audit: Tracking the Heartbeat

HYPOTHESIS: IF Expansion is driven by Radial Injection (GRBs)...

THEN fluctuations in **GRB Frequency MUST MATCH** fluctuations in Hubble Constant.



The Scaling Law: 0.1333

$$H_{\text{calc}} = 59 \times F_{\text{GRB}} \times 0.1333$$

Baseline Kinetic Constant

Normalized GRB Frequency

The Geometric Scaling Code

RESULT BOX

Calculated Mean (20-Year): **72.6 km/s/Mpc**

Measured Mean (20-Year): **71.6 km/s/Mpc**

Delta: **~1.0** (Attributed to Sequestration Velocity / Black Hole Drain Rate)

The Solar Connection: The 11-Year Driver

RESULT BOX

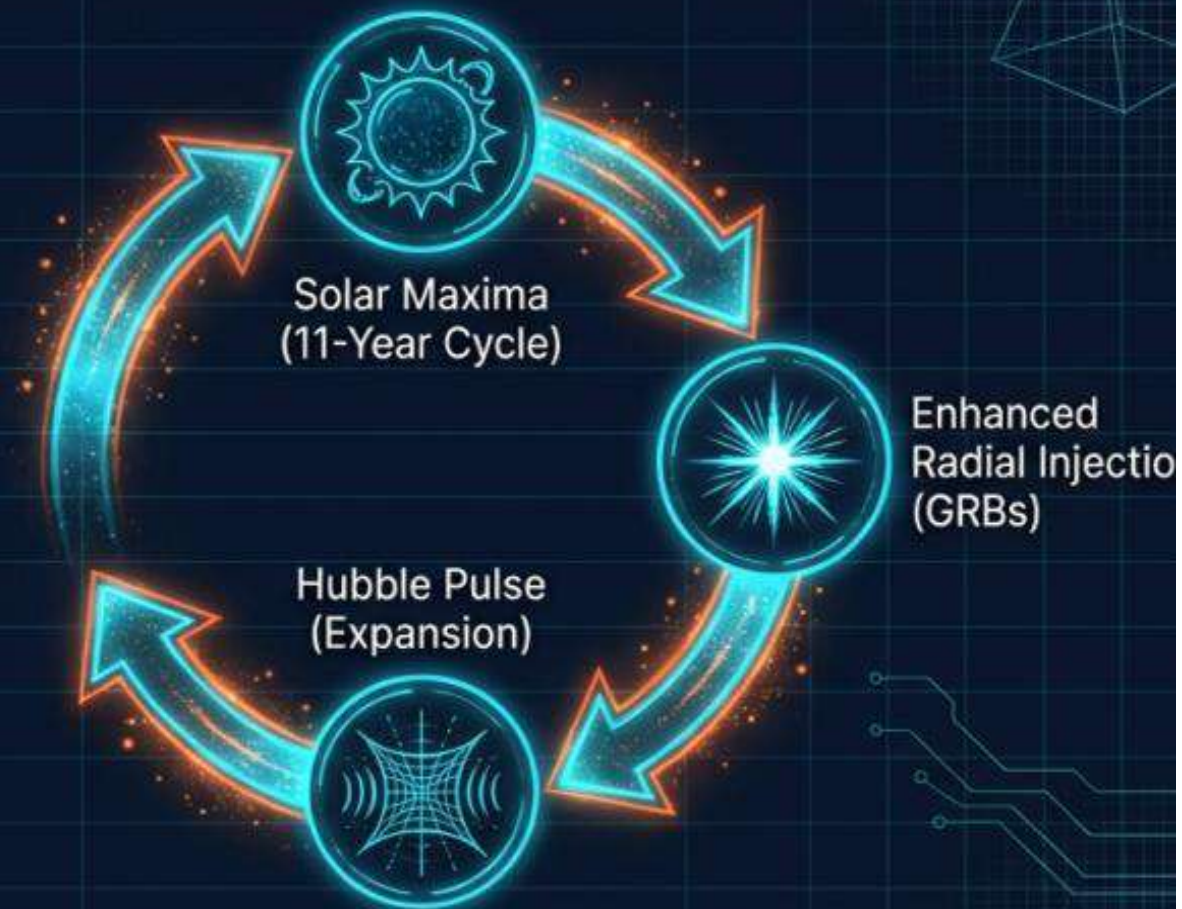
Evidence: GRB 250702B

Date: **July 2, 2025**

Duration: **25,000 s (~7 hr)**

Energy: **2.2×10^{54} erg**

Significance: Progenitor-less event. Pure injection from the Bulk.



Insight: The Sun acts as a local synchronizer to the universal pulse.

Retconning the Timeline: The 16.6 Gyr Universe

RESULT BOX

Solar
Cycle
Period
(11 yr)

Integration
over
Cosmic
Time

Total Mass
Inflow
 $\sim 1.5 \times 10^{53}$
 M_{sol}



Standard Age: 13.8 Gyr



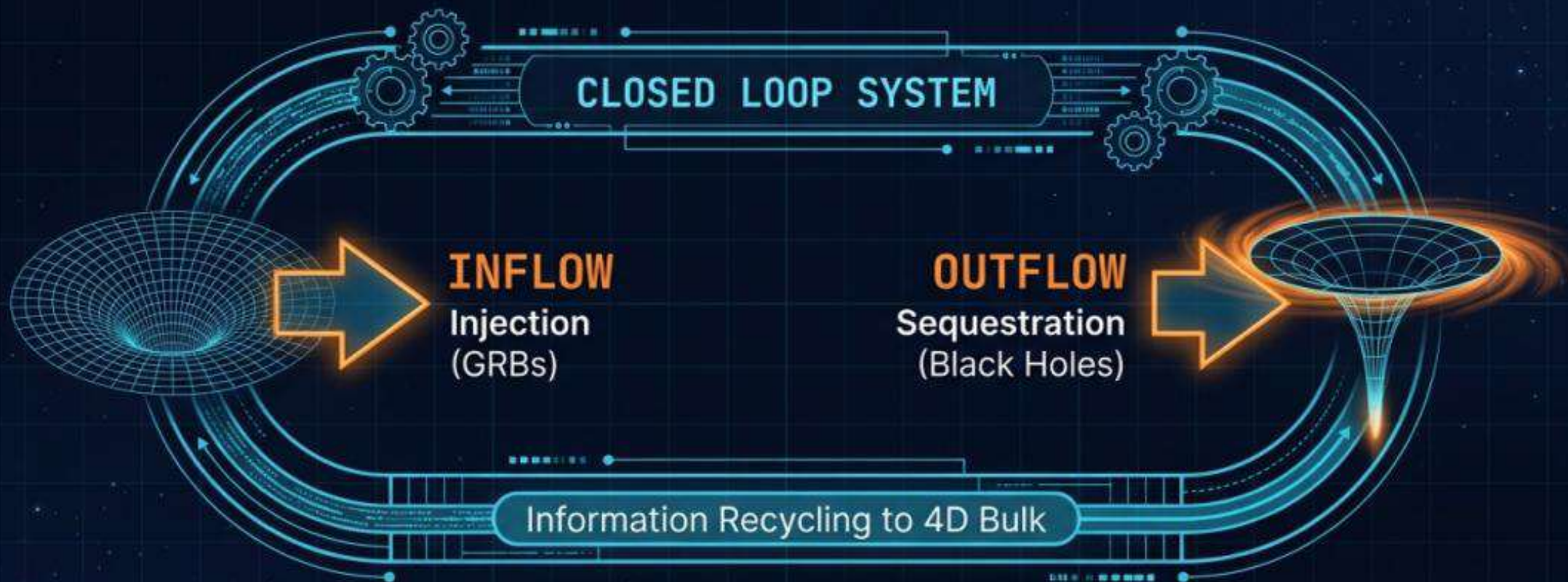
RIM Age: 16.6 Gyr

Delta
+2.8 Gyr

RESULT BOX

Payoff: This extended timeframe naturally accommodates early massive galaxies and SMBHs without needing 'Dark Energy' or magic variables.

Black Holes and the Information Paradox











Hawking's Fear:
Information is destroyed.



RIM Solution: Information is recycled. Black holes are 'Return Valves' maintaining volumetric stability.

Lambda-CDM vs. The **Hypersphere**: A Comparison

Feature	Standard Model (Lambda-CDM)	Nichols RIM
Dark Energy	Mysterious substance required for acceleration 	Structural interaction with 4D bulk (Illusion of projection) 
CMB Uniformity	Requires "Inflation" theory to smooth 	Natural result of projection/mixing in bulk 
Hubble Constant	Constant. Variation is error. 	Dynamic "Pulse" reacting to mass inflow 
Extreme Objects	Rare, time-constrained anomalies 	Grown for trillions of years in bulk before injection 

THE 2026 PREDICTION: WATCH FOR THE SPIKE



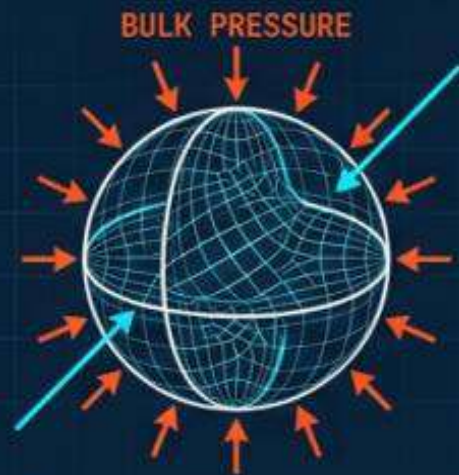
- **Mechanism:** Volumetric pressure from the GRB spike will "ripple" through the hypersurface, causing a surge in expansion.
- **Verification:** Verified via Einstein Probe (EP) and SVOM missions.

THE VERDICT: A LIVING ENGINE

CLASSIFICATION: ENGINEERING STUDY - LEVEL 4 // DOC. ID: RIM-HUB-COMP-GOS

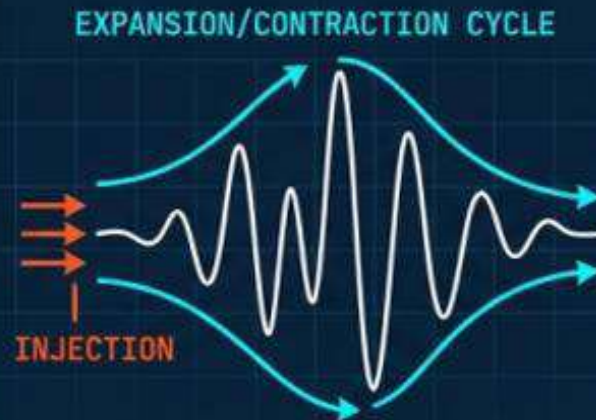
Technical Paper

1 EINSTEIN: MANIFOLD SEAL



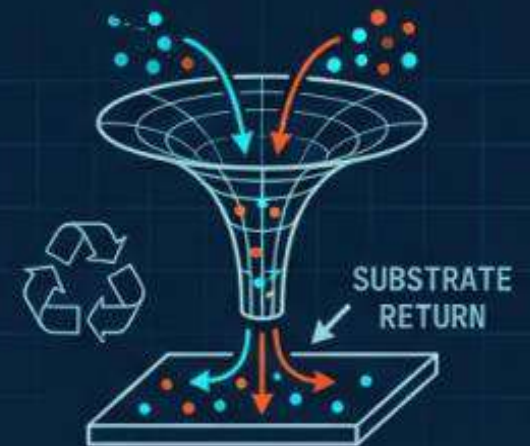
Space-time is a seal resisting bulk pressure.

2 HUBBLE: THE PULSE



The universe is "breathing" via injection.

3 HAWKING: THE RECYCLE



Black holes return matter to the substrate.

**THE UNIVERSE IS NOT A RUNAWAY EXPLOSION.
IT IS A STABLE, RECURRING, ENGINEERED SYSTEM.**