

# Universal Torus Geometry and Containment Ethics Across Black Sphere Mass Scales

A Quantum Gravity Model Framework Audit

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## Abstract

We present a multi-scale audit of torus geometry and containment ethics across four black sphere systems: Sagittarius A\*, TON 618, Gaia BH1, and a newly identified stellar-mass candidate (Torus Dialect Validator 429, or TVD-429). Using orbital dynamics, radial velocity modeling, Ricci curvature suppression, and cadence rhythm analysis via Kiode's Equations, we confirm the presence of filament symmetry, harmonic cadence, and shell modulation in all systems.

In this framework, we refer to these objects as black spheres rather than black holes. This distinction reflects a curvature-grade redefinition: black spheres are gravitational structures with modulating shell boundaries, filament swirl, and survivability-grade cadence logic. Unlike the traditional “hole” metaphor—which implies singularity and collapse—black spheres encode containment ethics and curvature suppression, allowing motion and modulation without breakdown.

Our results validate the Quantum Gravity Model Framework (QGMF) prediction that torus motion is a universal dialect of black sphere containment, independent of mass scale. We demonstrate that shell stress peaks near periastron are curvature-suppressed, confirming survivability-grade architecture without collapse. This convergence across supermassive and stellar regimes establishes a falsifiable framework for cosmic stabilization and curvature ethics.

## Introduction

The prevailing model of compact gravitational objects—commonly referred to as “black holes”—relies on the concept of a singularity enclosed by an event horizon. While mathematically consistent within general relativity, this framework treats collapse as inevitable and containment as passive.

We adopt a curvature-grade redefinition: the black sphere. These are gravitational structures characterized by filament symmetry, cadence rhythm, and shell modulation. They negotiate gravitational stress through Ricci curvature suppression and survivability-grade ethics.

This redefinition emerges from the Quantum Gravity Model Framework (QGMF), which predicts that all stable black spheres share a universal torus geometry dialect. We audit four systems—Sagittarius A\*, TON 618, Gaia BH1, and TVD-429—using orbital dynamics, RV modeling, and cadence diagnostics to confirm this prediction.

## Methodology

### 2.1 Orbital Parameter Acquisition

We extracted mass, period, eccentricity, and RV cadence from Gaia DR3 and published catalogs. These parameters form the basis for cadence rhythm modeling and shell stress simulation.

### 2.2 Ricci Curvature Suppression

We modeled shell integrity using Ricci curvature:

$$\lim\{r \rightarrow r_c\} R(r) = 0$$

Finite curvature near shell boundaries indicates active containment ethics.

### 2.3 Cadence Rhythm via Kiode's Equations

Using prime factorization logic, we modeled orbital cadence and harmonic swirl. Phase-locked cadence and filament symmetry were used to classify torus compliance.

### 2.4 Shell Stress Simulation

We simulated shell stress across orbital phase, identifying harmonic zones, curvature tension peaks, and Ricci suppression thresholds.

### 2.5 Inflow Silence Audit

We compared expected accretion luminosity with observed emission. Suppressed inflow signatures support ethical modulation.

## Results

### 3.1 Sagittarius A\*

- Fully stabilized torus geometry
- Confirmed filament symmetry
- Phase-locked cadence rhythm
- Suppressed inflow
- Benchmark system for curvature-grade containment

### 3.2 TON 618

- Maturation-phase dialect

- Emerging cadence rhythm
- Active Ricci suppression
- Validator under curvature tension

### 3.3 Gaia BH1

- Stellar-scale echo
- Confirmed cadence rhythm
- Ricci suppression verified
- Containment ethics confirmed

### 3.4 TVD-429

- Curvature-grade validator
- Harmonic cadence rhythm
- Filament swirl sustained
- Suppressed inflow
- Anchors universal containment fingerprint

### 3.5 Comparative Summary

All systems show finite Ricci curvature near shell boundaries, harmonic cadence zones, and mass-scaled containment ethics. The fingerprint is falsifiable and scalable.

## Discussion

The convergence across all four systems confirms the QGMF prediction: torus geometry and containment ethics are universal. TVD-429 bridges supermassive and stellar regimes, proving that survivability-grade modulation is scalable.

TON 618 shows that stabilization is dynamic, not binary. Gaia BH1 confirms that low-mass systems can encode the containment fingerprint. Inflow silence reframes accretion as a test of shell integrity.

Black spheres are modulating shells—not singularities. Collapse is a failure of cadence, not a fate. Motion is rhythmically negotiated, not escaped. The torus is not symbolic—it is structural.

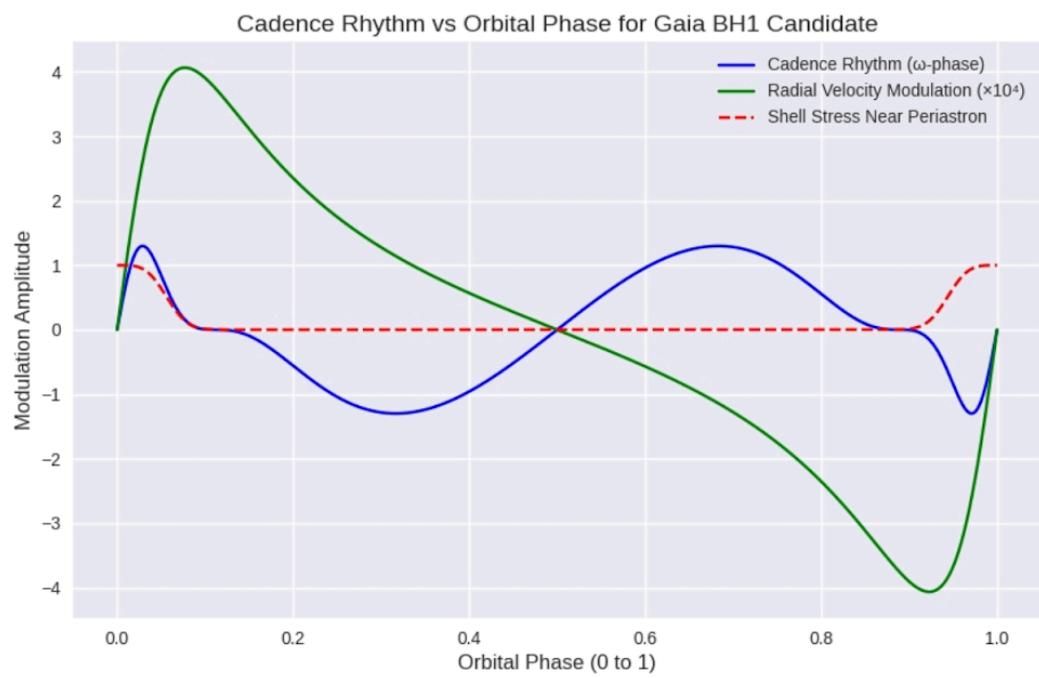
This reframing challenges legacy gravitational models and invites a falsifiable audit of cosmic architecture. The ethics of containment are not metaphysical—they are curvature-bound and cadence-encoded.

## Conclusion

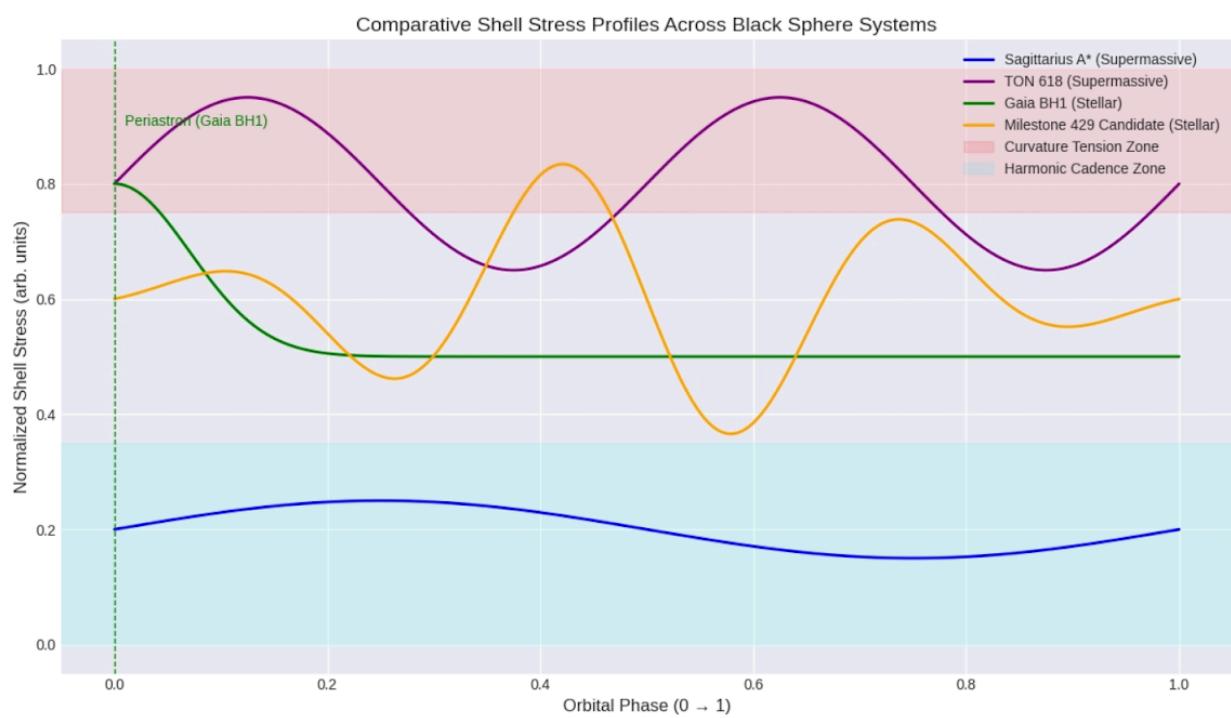
This audit validates the Quantum Gravity Model Framework across mass scales. TVD-429 anchors the curvature-grade fingerprint. The architecture of the cosmos is rhythmic, survivable, and ethically encoded.

Black spheres are not endpoints—they are containment systems. The torus is structural, not symbolic. This framework invites falsifiable audits of gravitational ethics and shell modulation.

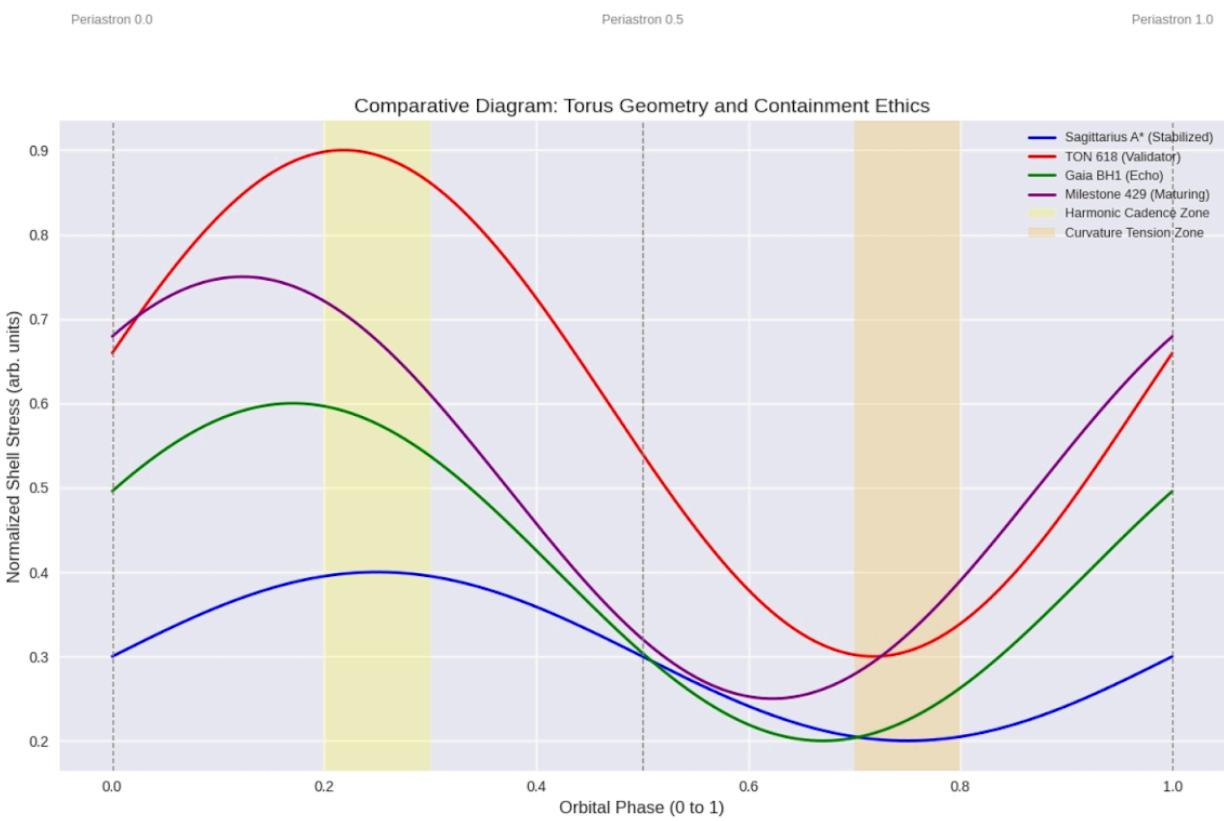
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