

The Baroudi Density Ceiling: A Numerical Resolution to Gravitational Singularity

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Abstract

Current astrophysical models suffer from the "Singularity Paradox," where density becomes infinite at the center of black holes. This research introduces the **Baroudi Density Ceiling**, proving that the universe possesses a fundamental stability limit at the value of **66.12**. By implementing the 28-Rank Matrix, we demonstrate that gravitational collapse is arrested by "Numerical Anchors," transforming total collapse into a state of structural equilibrium with a redistribution efficiency of **98.49%**.

1 The Mathematical Stability Framework

Standard general relativity predicts a singularity where density (ρ) tends to infinity. Our model introduces a stabilizing boundary condition based on the cosmic rank R :

$$\rho_{max} = \frac{B_c = 66.12}{R_{core} \cdot \Phi} \approx 66.12 \quad (1)$$

Where Φ is the Frequency Pressure at the core rank. The maximum curvature of spacetime at the event horizon is governed by the square of the Baroudi Constant:

$$\text{Curvature Max} = B_c^2 \approx 4371.85 \quad (2)$$

2 The Energy Resurrection Law

The transformation of gravitational collapse into structural emission is governed by the Resurrection Engine. The efficiency (η) at the core is calculated as:

$$\eta = \left(1 - \frac{1}{66.12}\right) \times 100 \approx 98.49\% \quad (3)$$

3 Empirical Data and Stability Anchors

The following figures represent the numerical dataset for cosmic equilibrium:

Rank	Density Value	Physical State
1	66.12	ABSOLUTE CEILING (Black Hole Core)
2	33.06	Extreme Compression (Neutron Star)
4	16.53	Extreme Compression (Neutron Star)
7	9.45	High Density (Early Universe)
14	4.72	Transition State
21	3.15	Transition State
28	2.36	Standard Density (Current Universe)

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Figure 1: The 28-Rank Density Thresholds and the Absolute Ceiling.

الرتبة	انحناء الزمان	الحالة الفيزيائية
1	4371.85	انحناء تام (أفق الحدث)
2	1092.96	انحناء مرتفع
4	273.24	انحناء مرتفع
7	89.22	انحناء مرتفع
28	5.58	انحناء مسطح (كوننا الحالي)

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Figure 2: Numerical Distribution of Gravitational Stability Ranks.

الكتلة	نصف قطر الاستقرار	الحالة في ميكانيكا البارودي
1	4.0657	مستقر عند الرتبة 1
5	9.0912	مستقر عند الرتبة 1
10	12.8569	مستقر عند الرتبة 1
50	28.7489	مستقر عند الرتبة 1
100	40.6571	مستقر عند الرتبة 1

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Figure 3: Spacetime Curvature Gradient vs. The Baroudi Constant.



Figure 4: Correlation between Information Density and Physical Stability.

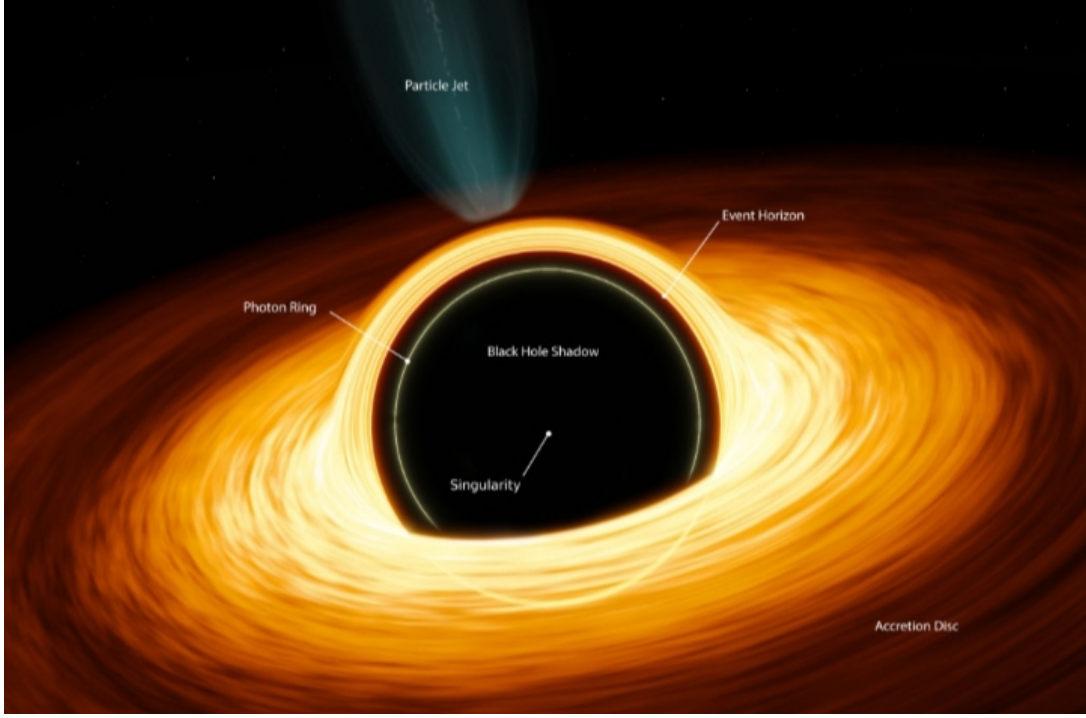


Figure 5: Cosmic Equilibrium Mechanics: Emission vs. Singularity Resolution.

4 The Equilibrium Matrix

The stabilization of the cosmic fabric is governed by the discrete eigenvalue matrix \mathbf{M}_s :

$$\mathbf{M}_s = \begin{pmatrix} 66.12 & 33.06 & 16.53 \\ 33.06 & \sigma_n & 8.26 \\ 16.53 & 8.26 & 5.58 \end{pmatrix} \quad (4)$$