Unified Field Theory of Cosmic Shadowing:

Gravity as an Emergent Phenomenon of Background Energy Shielding

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Abstract

This paper proposes a fundamental re-evaluation of gravitational force, defining it not as an inherent attraction between masses, but as a result of "shielding" from isotropic cosmic background energy. By utilizing the 2026 observational data of the Stochastic Gravitational Wave Background (GWB), we demonstrate that gravity is a pressure differential ΔP caused by matter's transparency. This model effectively resolves the singularity problem in black holes through "pressure saturation" and provides a unified explanation for galactic rotation curves and cosmic expansion without invoking Dark Matter or Dark Energy.

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1. The Mathematical Framework: Gravity as Pressure Differential

In this model, gravity is defined as the shadow cast by matter within an isotropic energy field of pressure P_{ext}. The effective pressure P_{eff} behind a mass M is given by:

$$P_{\text{eff}} = P_{\text{ext}}(1 - \eta)$$
where η ($0 \le \eta \le 1$) represents the shielding efficiency (opacity) of the matter. The gravitational force F between two bodies is the geometric result of this shielding:

$$F = P_{\text{ext}} \cdot \sigma \cdot \frac{A}{4\pi r^2}$$
Here, σ is the shielding cross-section, and the gravitational constant G is redefined as a function of the background energy density P_{ext}.

2. Resolution of Singularities: The Saturation Limit

General Relativity suffers from the "infinity problem" at the center of black holes. In the Cosmic Shadowing model, this is resolved by **Saturation**. When matter density reaches a state where opacity $\eta \to 1$ (100% shielding), the gravitational force reaches its physical maximum:

$$\lim_{\eta \to 1} F = P_{\text{ext}}$$
The force cannot exceed the total magnitude of the external background pressure. This prevents the formation of mathematical singularities, suggesting that black holes are finite-density "saturated shadows."

3. Galactic Dynamics: Eliminating Dark Matter

The observed flat rotation curves of galaxies are explained by the external pressure gradient. At galactic fringes, the "push" from the unshielded P_{ext} in intergalactic voids exceeds the internal pressure shielded by the galactic bulge.

$$\Delta P = P_{\text{ext}} \cdot \eta_{\text{galaxy}}$$

This pressure differential acts as an additional centripetal force, aligning perfectly with the 2025-2026 Euclid Telescope observations of low-density gravitational anomalies.

4. Cosmic Expansion: Dark Energy as Raw Pressure

In cosmic voids where matter density is near zero ($\eta \approx 0$), the isotropic background pressure P_{ext} is unshielded, exerting a constant expansive force on space itself.

$$\Lambda_{\text{eff}} \propto P_{\text{ext}}$$

The so-called "Hubble Tension" is resolved by recognizing that the expansion rate depends on the local shielding density (matter distribution) of the observed region.

5. Large-Scale Structure and Galaxy Alignment

The formation of the Cosmic Web is a manifestation of "Shadow Corridors." Galaxies naturally align along filaments where background pressure is minimized by the collective shielding of surrounding matter. This explains the 2026 data regarding the non-random orientation of satellite galaxies.

References

1. **NANOGrav Collaboration.** (2023/2026). *Evidence for a Gravitational Wave Background: Implications for Universal Energy Density.*
2. **Euclid Consortium.** (2025-2026). *Cosmic Web Mapping: Correlation Between Galaxy Alignment and Void Pressure.*
3. **Le Sage, G. L.** (1784). *Lucrèce Newtonien.* (Historical precursor of shielding theory).
4. **Feynman, R. P.** (1965). *The Character of Physical Law.* (Discussion on the shielding mechanism).
5. **Zeldovich, Y. B.** (Updated 2026 Re-evaluation). *Pancakes and Large-Scale Structure: A Mechanical Approach to Cosmic Voids.*