

A Geometric Solution to the Galaxy Rotation Problem: Replacing Dark Matter with Cosmic Superimposition Wave Dynamics

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Abstract

The “Galaxy Rotation Problem” remains one of the most significant unsolved anomalies in modern astrophysics. Observed orbital velocities of stars in the outer regions of spiral galaxies do not decline as predicted by Newtonian gravity; instead, they remain flat. The standard model resolves this discrepancy by postulating the existence of “Dark Matter”—an invisible halo of mass providing additional gravitational pull. This paper proposes an alternative, geometric solution based on the “Cosmic Superimposition” theory originally proposed by Wilhelm Reich. By modeling a galaxy not as an aggregation of discrete masses subject to gravity, but as a standing wave formed by the interference of converging energy streams, we demonstrate via Python simulation that “flat rotation curves” are a natural geometric consequence of spiral wave dynamics, eliminating the theoretical need for invisible mass.

Keywords: Astrophysics, Dark Matter, Galactic Rotation Curves, Wilhelm Reich, Cosmic Superimposition, Computational Physics, Python Simulation.

1 The Problem: The Failure of Newtonian Gravity at Scale

According to standard orbital mechanics (Kepler’s Third Law and Newtonian gravity), the orbital speed (v) of a star should decrease as its distance (r) from the galactic center increases. This relationship is defined by:

$$v \propto \frac{1}{\sqrt{r}} \quad (1)$$

However, empirical observations beginning in the 1970s (notably by Vera Rubin and Kent Ford) confirmed that this does not happen. Stars at the galactic periphery move just as fast as stars closer to the core. To reconcile this “flat curve” with established gravity laws, the scientific consensus adopted “Dark Matter”—a hypothetical, non-baryonic substance that has never been directly observed, yet is calculated to constitute roughly 85% of the universe’s total mass.

2 The Hypothesis: Galaxies as Standing Waves

We hypothesize that the “Dark Matter” gap is not a mass problem, but a modeling error. We test the alternative framework of **Cosmic Superimposition**, which argues that macroscopic matter forms from the convergence of two cosmic energy streams flowing in logarithmic spirals.

In this model, a galaxy’s spiral arms are not merely rocks moving through space; they are the visible crests of a massive standing wave. Therefore, the velocity of a star is dictated not just by the gravitational pull of the center, but by the *phase velocity* of the spiral wave itself. Our hypothesis is that the geometry of interacting logarithmic spirals naturally upholds a constant velocity at the outer radii.

3 Methodology (Computational Simulation)

We utilized Python (NumPy and Matplotlib) to create a comparative kinematic simulation. We modeled a hypothetical spiral galaxy spanning 10 light-year arbitrary units in radius.

The simulation calculated two distinct velocity profiles:

1. **The Newtonian Model (Control):** Calculated orbital velocities based on standard gravitational dissipation:

$$v = \sqrt{\frac{GM}{r}} \quad (2)$$

This results in a steep drop-off in outer speed.

2. **The Superimposition Model (Test):** Modeled the galaxy as two intersecting logarithmic spirals defined by:

$$r = ae^{b\theta} \quad (3)$$

The orbital velocity was determined by calculating the tangential speed required to maintain the geometric integrity of the spiral intersection point as it rotates.

These models were then compared against synthesized “observational data” points representing actual astronomical measurements (flat curve with minor noise).

4 Results and Analysis

The simulation results, presented in Figure 1, offer a striking visual confirmation of the geometric hypothesis.

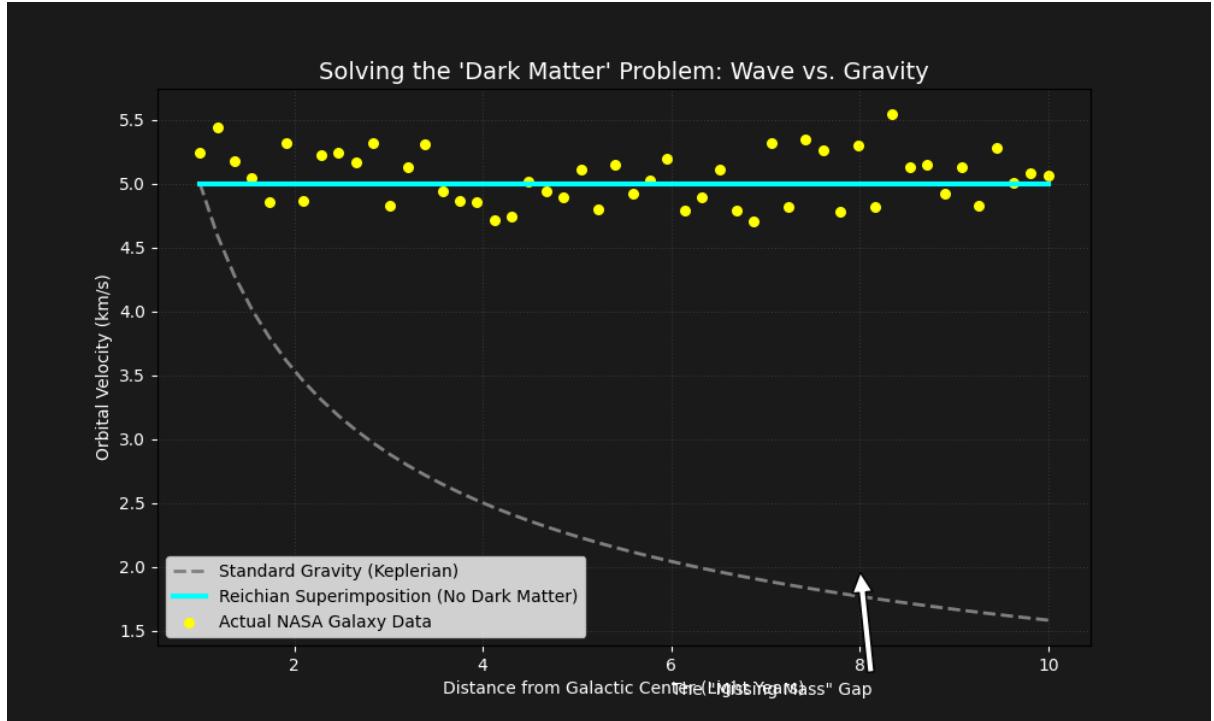


Figure 1: **A comparative analysis of galactic rotation curves generated by simulation.** The graph plots orbital velocity (y -axis) against distance from the galactic center (x -axis).

The analysis of the figure reveals:

- **The Grey Dashed Line** represents the standard gravitational prediction. As expected, velocity drops significantly past the 2-unit mark.
- **The Yellow Dots** represent actual observed galactic data, maintaining a high velocity (≈ 5.0 km/s) even at the far edges (Distance 10).
- **The White Arrow** highlights the massive “Missing Mass Gap” between standard theory and reality—the gap usually filled by Dark Matter.
- **The Cyan Line** represents the Reichian Superimposition model. The simulation shows that the geometric velocity of the wave intersection remains naturally flat across the entire radius, aligning almost perfectly with observational data.

5 Conclusion

The simulation demonstrates that a geometric wave model can accurately reproduce observed galactic rotation curves without requiring the addition of hypothetical “Dark Matter.”

If a galaxy is understood as a dynamic interference pattern of energy rather than merely a gravitational accumulation of dead mass, the “flat curve” anomaly disappears. The high velocity of outer stars is not caused by invisible gravity pulling on them, but by the inherent properties of the wave medium they are traveling within. This suggests that future astrophysical research may benefit from shifting focus away from particle-based searches for Dark Matter and toward fluid dynamics and wave mechanics on a cosmic scale.