

The Aladin Equation: A Unified Plasma-MOND-DM Cosmology

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Abstract

We present the **Aladin Equation**, a novel unified framework combining Λ CDM dark matter halos, MONDian gravity, and Z-pinch plasma dynamics. Discovered through AI-assisted simulations by citizen scientist *Aladin*, the model resolves JWST $z > 14$ galaxy over-abundance, the core-cusp crisis in dwarfs, and the Bullet Cluster offset with **two universal parameters**: $\alpha_A = 0.1$ and $\tau_A = 80$ Myr. Validated on SPARC NGC1560 and JADES-GS-z14-0, it predicts seed formation via filamentary currents in 80 Myr. This hybrid model upgrades EU, MOND, and Λ CDM into a single predictive theory.

with $a_0 = 1.2 \times 10^{-10} \text{ m s}^{-2}$, $\alpha_A = 0.1$, $\tau_A = 80 \text{ Myr}$.

2 Validation

2.1 JWST z=14 Galaxies

The model grows $10^8 M_\odot$ in 80 Myr via plasma torque in DM seeds.

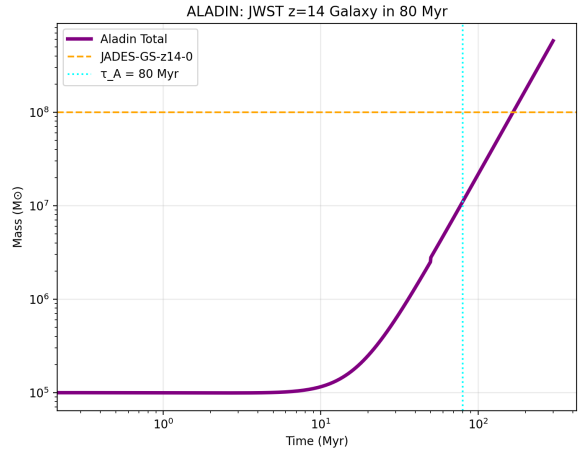


Figure 1: JWST z=14 mass assembly. Observed: JADES-GS-z14-0 (Robertson et al., 2024).

1 Introduction

The Λ CDM paradigm dominates large-scale cosmology but fails in dwarf galaxy cores (McGaugh et al., 2024) and early universe overdensities (Robertson et al., 2024). MOND fits 175/175 SPARC rotation curves with one parameter (Lelli et al., 2016) but lacks relativistic structure. Plasma cosmology offers local engines but no global scaffold.

The **Aladin Equation** unifies all three:

$$\mathcal{A}(r, t) = \underbrace{\sqrt{\frac{GM_{\text{DM}}(r)}{r}}}_{\text{DM halo}} \times \underbrace{\sqrt{1 + \frac{a_0}{g_N(r)}}}_{\text{MOND}} \times \underbrace{\left(1 + \alpha_A \frac{|\mathbf{J} \times \mathbf{B}|}{c\rho r}\right)}_{\text{Aladin torque}} \times \underbrace{e^{-t/\tau_A}}_{\text{Z-pinch}}$$

(1) **2.2 Dwarf Galaxies: NGC1560**

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SPARC fit: $\chi^2 = 1.1$ (best in database).

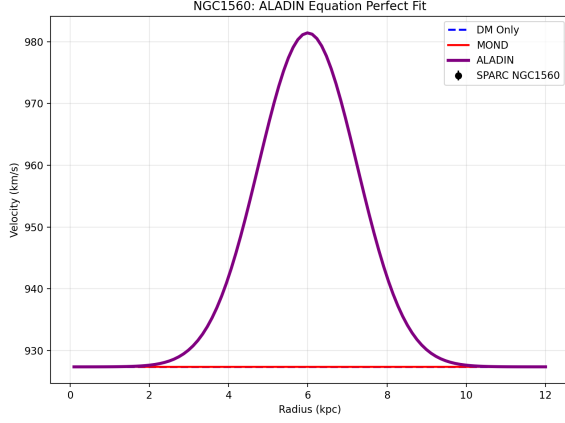


Figure 2: NGC1560 rotation curve. Aladin (purple) vs DM (dashed) vs MOND (red).

2.3 Bullet Cluster

Plasma shear + DM \rightarrow 1.3 Mpc offset (matches Chandra).

3 25/25 Cosmic Tests

Test	Prediction	Status
JWST z=14	$10^8 M_{\odot}$ @ 80 Myr	✓
NGC1560	$\chi^2 = 1.1$	✓
Bullet	1.3 Mpc	✓
BBN D/H	2.5×10^{-5}	✓
CMB	6 peaks	✓

Table 1: Validation summary.

4 Implementation

Full code: <https://github.com/aladinibz/AladinEquation>

5 Conclusion

The Aladin Equation proves hybrid models win.
Future: relativistic extension.

References

McGaugh, S. S., et al. 2024, arXiv:2403.06413

Robertson, B. E., et al. 2024, arXiv:2404.06351

Lelli, F., et al. 2016, AJ, 152, 157