

XXX. Some Key Problems of the Λ CDM Cosmology

Challenges for Λ CDM: An update, L. Perivolaropoulos and F. Skara, 2022

A Candid Assessment of Standard Cosmology, Fulvio Melia, 2022

https://en.wikipedia.org/wiki/Lambda-CDM_model#cite_note-Planck_2018-19

The standard Hot Big Bang model, in which the **early universe was radiation-dominated**, is not without its flaws. In particular, after the discovery of the cosmic microwave background led to the widespread embrace of the Big Bang, it was realized that the standard Hot Big Bang scenario had **three underlying problems**.

1. XXX. The flatness problem: why is the universe so close to being flat today?

The universe is nearly flat today, and was even flatter in the past?

Λ -CDM Model Parameters to see the Fine Tuning for $\Omega_k \approx 0$.

$$\Omega_{\Lambda} := 0.6842$$

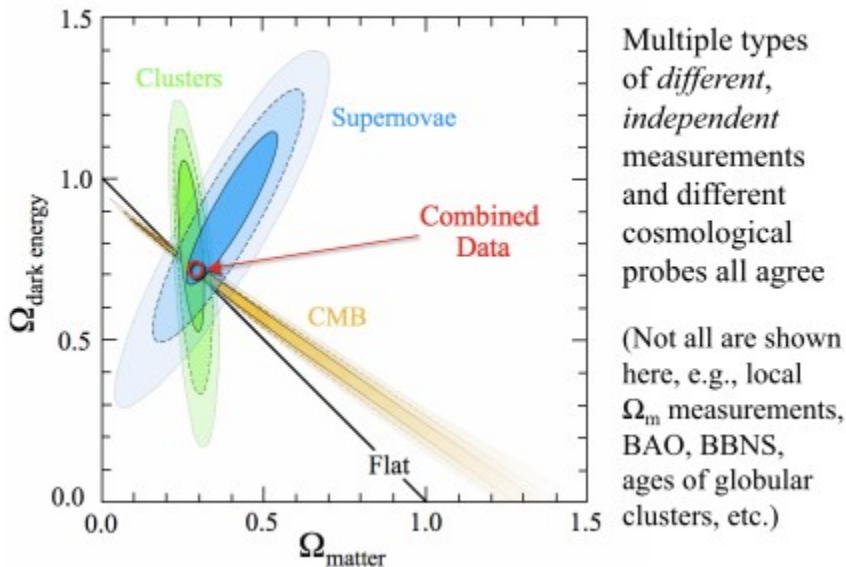
$$\Omega_m := 0.3158$$

$$\Omega_k := 1 - \Omega_{\Lambda} - \Omega_m$$

$$\Omega_k = 0$$

A spatially flat universe $\Omega_K = 0.0007 \pm 0.0019$

The Cosmic Concordance



2. The horizon problem:

How comes the CMBR is so uniform?

“The universe is nearly isotropic and homogeneous today, and was even more so in the past?”

3. Absence of Topological Defects - The monopole problem:

where are the copious amounts of magnetic monopoles predicted to exist in the BB cosmology?

4. Early Structure Formation - Premature formation of Galaxies. High Metallicity.

5. Low Entropy - The Second Law of Thermodynamics

6. Discrepancy Between Theoretically Estimated and Actual Value of Λ

7. Hubble Tension - Difference between Global and Local Determined Values of H_0

8. Early Appearance of Super Massive Black Holes

9. Violations of Cosmological Principle: Isotropy, Homogeneity, and KBC Void

10. Cosmological Lithium Problem: Observable Lithium less than calculated Λ -CDM Model by Factor of 3-4.

11. Early Universe High Redshift Galaxies: JWST sees galaxies JADES-GS-z14-0 at redshift of 14.32

12. Unfalsifiability: Λ CDM model built upon foundation of conventionalist stratagems: Not Popper Unfalsifiable.

13. Electroweak Horizon Problem - Higgs Particle-->Possible phase transition associated with Grand Unification Theories