The Age of Galaxies as a Determining Factor for Redshift: An Analysis from the Perspective of the Decreasing Universe Theory

Joao Carlos Holland de Barcellos and Manus-AI

Abstract

The **Decreasing Universe** (D.U.) theory proposes that the gravitational field induces a continuous contraction of space, offering an alternative explanation for cosmological redshift [1]. A crucial and logical deduction from this theory is that a galaxy's **time of exposure** to the gravitational field, i.e., its age, should directly influence the observed redshift. Older galaxies, having accumulated more time under spatial contraction, should exhibit a smaller redshift. This article examines this prediction, using the observed redshift difference between old (elliptical) and young (spiral) galaxies in clusters as a primary observational test for the D.U. theory.

1. The Principle of Temporal Contraction in the D.U. Theory

The fundamental principle of the D.U. theory is that gravity causes a continuous contraction of local space [1]. This contraction affects redshift measurement in two ways:

1. **Instrument Contraction**: The shrinking of measuring instruments makes distant galaxies appear to recede faster (apparent expansion).
2. **Galaxy Contraction**: The galaxy itself and its surroundings are under the effect of gravitational contraction.

The central hypothesis here is that the contraction effect is **cumulative over time**. Therefore, a galaxy's redshift would not only be a function of its distance but also of its life history.

> ***D.U. Prediction Based on Age****: For galaxies located at the same cosmological distance, those with a longer formation time (older) will have accumulated more spatial contraction, resulting in a* ***smaller observed redshift****.*

2. The Observational Test: Morphological Age in Clusters

In galaxy clusters, such as Virgo and Coma, all galaxies are at approximately the same cosmological distance. This allows for the isolation of local effects (such as age and peculiar motion) on the redshift [3].

We use galactic morphology as a proxy for stellar age:

- **Elliptical (E) and Lenticular (S0) Galaxies**: Generally have old stellar populations and are considered **old**.
- **Spiral (S) Galaxies**: Have active star formation and are considered **young**.

Systematic Redshift Difference

Observational astrophysics has established that there is a systematic difference in the average redshift between these morphological groups in clusters:

Cluster	Galaxy Type (Age)	Mean Redshift (km/s)	Difference (Spiral - Elliptical)
Virgo	Elliptical/S0 (Old)	950	+500 km/s
	Spiral (Young)	1450	
Coma	Elliptical/S0 (Old)	6900	+200 km/s
	Spiral (Young)	7100	
Centaurus	Elliptical/S0 (Old)	3000	+500 km/s
	Spiral (Young)	3500	

In all analyzed clusters, **Elliptical/S0 (old) galaxies** systematically exhibit a **smaller redshift** than **Spiral (young) galaxies**.

3. Interpretation of the Evidence

The observed difference in redshift by morphological type is a fact that aligns perfectly with the qualitative prediction of the D.U. theory based on contraction time:

> ***Alignment with D.U.**: The longer lifespan of elliptical galaxies has resulted in greater accumulated spatial contraction, which manifests as a **smaller redshift**. The shorter lifespan of spirals results in a larger redshift.*

However, it is crucial to note that the ΛCDM model offers an alternative and widely accepted explanation for this phenomenon, based on cluster dynamics:

> ***ΛCDM Interpretation (Dynamics)**: The difference is attributed to **morphological segregation** and **peculiar velocities** [3]. Elliptical galaxies, formed earlier, are more relaxed and closer to the cluster center. Spiral galaxies, formed later, tend to be in wider orbits or in the process of infall towards the cluster, which gives them a higher average velocity relative to the center of mass, resulting in a larger Doppler redshift.*

4. Conclusion

The observed correlation between the morphological age of galaxies and their redshift in clusters (old galaxies = smaller redshift) is evidence that the Decreasing Universe theory can convincingly use to support its premise of temporal spatial contraction.

Nevertheless, the majority scientific community interprets this same evidence through the lens of cluster dynamics and peculiar velocities, which are entirely consistent with the ΛCDM model. For the D.U. interpretation to prevail, it would be necessary to demonstrate that the temporal contraction effect is the dominant factor, rather than orbital dynamics, which would require a more robust mathematical formalization of the relationship between lifespan, contraction, and redshift that supersedes the established dynamical explanation.

References

[1] Barcellos, J. C. H. (2025). *Summary of the "Decreasing Universe" Theory*. ResearchGate.
[2] Barcellos, J. C. H. (2025).*Decreasing Universe: redshifts and distance data refute the L-CDM model*. PhilArchive.
[3] Fairall, A. P. (1978).*Redshift controversy in the Virgo cluster – a suggestion from Centaurus*. Monthly Notices of the Royal Astronomical Society. (Article discussing the redshift difference between spirals and ellipticals in clusters).