

Review of: "Why Mature Galaxies Seem to have Filled the Universe shortly after the Big Bang — A New Cosmological Model, that Predicted the JWST Observations"

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Potential competing interests: No potential competing interests to declare.

The paper introduces a very interesting idea. Its main downside is that there are not enough observational evidence yet to prove the correctness of the model. The “proof” discussed in Section 11 is not really a proof, but an observation that can be aligned with the theory, but definitely does not provide a full proof to its correctness. The last sentence of the Conclusion section also seems too strong, and it should be left for the readers to decide. But it is an interesting theory that might worth developing, and should be examined further. Due to the numerous weaknesses of the standard model, it is definitely worthwhile exploring other options.

One thing that comes to mind is the three-decade old theory of Holographic Universe. I think that many readers might think of Holographic Universe in the context of this work, and an explanation of the existence or inexistence of links between the two can be helpful. Obviously, there is plenty of literature on holographic Universe, such as:

- Susskind, L. The world as a hologram. J. Math. Phys. **1995**, 36, 6377–6396.
- Bak, D.; Rey, S.J. Holographic principle and string cosmology. Class. Quantum Gravity **2000**, 17, L1.
- Bousso, R. The holographic principle. Rev. Mod. Phys. **2002**, 74, 825.
- Myung, Y.S. Holographic principle and dark energy. Phys. Lett. B **2005**, 610, 18–22.
- Hu, B.; Ling, Y. Interacting dark energy, holographic principle, and coincidence problem. Phys. Rev. D **2006**, 73, 123510.
- Rinaldi, E.; Han, X.; Hassan, M.; Feng, Y.; Nori, F.; McGuigan, M.; Hanada, M. Matrix-Model Simulations Using Quantum Computing, Deep Learning, and Lattice Monte Carlo. PRX Quantum **2022**, 3, 010324.

I am not entirely sure I understand how the model explains the galaxy rotation curve anomaly, but there are other

observational evidence aligned with the model such as the H_0 tension, accelerated expansion, and the very early “late-type” galaxies observed by JWST. That’s very interesting. It could also be that higher population of galaxies that rotate clockwise in one hemisphere compared to the opposite hemisphere (which makes a mirrored Universe in opposite directions of observation).

<http://doi.org/10.1093/mnras/stac2372>

<https://doi.org/10.3390/universe8080397>

The idea of a different redshift model is also very interesting, although direct observational evidence are not yet complete at this point. But that can change in the future. A different redshift model can indeed explain numerous anomalies. It reminds of some other models based on modified redshift such as <https://oa.mg/work/3113740256> .

Section 10:

The wording might make the reader believe that *all* distant galaxies are also late type. I guess that’s not what the purpose, but the wording makes one believe that that is the case. In practice, just some distant galaxies are expectedly fully developed, which is just as puzzling.

Also, these galaxies may or may not require to re-think the entire standard cosmological model. The explanation can also be something more local, although the observation is puzzling and does not have a clear immediate explanation. But for challenging the standard model there are plenty of other probes. A review paper that summarizes these probes is at (<http://doi.org/10.1088/1361-6382/acbefc>).

Section 11:

It takes some imagination to understand why the H_0 tension is aligned with the observation. There is no quantitative analysis, and the description is a bit sketchy. BTW, it could be related that when using Ia supernovae that rotate in the same direction relative to the Milky Way, the H_0 tension seem to drop sharply (<https://www.preprints.org/manuscript/202301.0390/v1>).

The paper is well-written, but there are some typos (e.g., “redshiff”) and some weird punctuations and spacing that can be corrected. Also note that “equation 19” should be “Equation 19”, and “figure 5” should be “Figure 5”, etc, throughout the manuscript. Some equations are numbered and some are not numbered, and it is not clear why.

I hope these comments are helpful.

