Concept Paper

Kalpa AND Pralaya: TimeScales Corresponding to Major Cosmological Events — A Concept Paper

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Kalpa AND Pralaya: TimeScales Corresponding to Major Cosmological Events—A Concept Paper

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Abstract: Indian Cosmology describes Cosmic Cycles and Brahma as the Creator of the Universe. A Day of Brahma is called Kalpa and is 4.32 billion years. A Night of Brahma is called Pralaya and is also 4.32 billion years. The Concept Paper examines whether there were significant cosmological events during Brahma's Day and reduced cosmological activity during Brahma's Night. Taking the Big Bang as a starting point and that the Universe is ~13.7 billion old, there have been two complete Kalpas and one complete Pralaya and the Universe is now ~760 million years into the second Pralaya. The Concept Paper attempts to correlate significant cosmological events during a Kalpa, and reduced cosmic activity during a Pralaya. While there does seem to be a correlation, given that there have been only two complete Kalpas and one complete Pralaya, the concept needs more research to definitively establish a correlation.

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Introduction

Cosmic Cycles described in several Ancient Indian Texts contain nested time periods and various cosmic events that occur within each nested period and the final period describes the cycle from Creation ending with Dissolution. After the dissolution there is a period of Stasis after which the process of Creation commences anew. Effectively Indian Cosmology presents an eternally cycling process.

All the time periods are eons and therefore none of them, except for one cycle, can be proven by observable evidence. This Cycle is referred to as Kalpa and Pralaya and each period denotes 1 day and 1 night in the lifespan of Brahma, the Creator described in the texts. Each of these periods lasts for 4.32 billion solar years. The general consensus is that the Universe is ~13.7 billion years old[1], it has been recently suggested that it could be as old as 26.7 billion years old.[2] For the purposes of this paper, these are not relevant. This paper investigates whether there were observable cosmic phenomena that occurred during each Kalpa and each Pralaya. In both cases, we are now in a day of Brahma. In order to not complicate our analysis, we will use the age of ~13.7 billion years.

1st Kalpa (Brahma's Day)

Observable Phenomenon at the Culmination of 4.32 Billion Years

The thin disk of our galaxy began to form when the universe was about 5 billion years old or 9 ± 2 Gya.

Th/Euratios have also been used by del Peloso, da Silva & Arany-Prado (2005), del Peloso, da Silva & Porto de Mello (2005), and del Peloso et al. (2005) to determine an age for the Galactic disk of 9 ± 2 Gyr. In this case the age is not from individual stars but from matching the observations to models of Galactic chemical evolution that take several effects into account that enrich and destroy Th and Eu with time.[3]

Based upon the emerging science of nucleocosmochronology, the Galactic thin disk of the Milky Way is estimated to have been formed 8.8 ± 1.7 billion years ago. It may have collided with a smaller

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satellite galaxy, causing the stars in the thin disk to be shaken up and creating the thick disk] while the gas would have settled into the galactic plane and reformed the thin disk.[Error! Reference source not found. 5]

Brahma commences his sleep.

Indian Puranas describe 14 entities with the common epithet "Manu" who along with their sons protect and preserve Brama's Creation. it is possible that these entities continue to carry out the processes set in motion by Brahma during his day. The detailed explanation of the role and lifetime of the "Manus" is beyond the scope of this concept paper.

1st Pralaya (Brahma's Night) 4.32 Billion Years to 8.64 Billion Years

Research-based evidence for specific cosmological events during this period is limited. While the absence of evidence is not evidence of absence, it is important to acknowledge the current lack of scientific data concerning this era. This gap in our understanding could represent a genuine period of relative cosmic quiescence or simply a lack of focused research. Further investigation is needed to determine if this period corresponds to a genuine cosmic interlude.

2nd Kalpa 8.64 Billion Years to 12.96 Billion Years

In their article "The age of the Solar System redefined by the oldest Pb–Pb age of a meteoritic inclusion" Audrey Bouvier and Meenakshi Wadhwa present evidence to demonstrate that the Solar System was formed ~4.5 billion years ago.[6]

The extended period of cosmic acceleration that **began about 9 billion years** after the Big Bang and continues today. Scientists discovered the increasing expansion of the universe in 1998 through observations of distant supernovae (exploding stars). The scientists who discovered cosmic acceleration received the 2011 Nobel Prize in Physics. [7]

12.8 billion years ago: Interactions between Andromeda and its companion galaxies Messier 32 and Messier 110.[8] Galaxy Messier 82 collides with M81.[9]

2nd PRALAYa 12.96 Billion Years to 17.28 Billion Years

We are now 740 million years into the 2nd Pralaya, which when compared to the age of the universe is the equivalent of 3 minutes in an hour. Observations conclude that the acceleration that began ~5 billion years ago continues.

Conclusion

Preliminary evidence suggest that significant cosmic events have occurred at the end of a Kalpa followed by what appears to be a period of consolidation during a Pralaya. Given that there have been only two Kalpas and one complete Pralaya since the Big Bang, the sample size is insufficient to draw any definite conclusion. The acceleration that began ~5 billion years ago continues. and while none of us will be around to see what happens at the end of this Pralaya, it is hoped that this concept paper arouses sufficient interest to merit further research.

It is important to acknowledge the current lack of observable events during the Pralaya periods. This could be due to the limitations of our observational techniques or the possibility that events during Pralaya are subtle and not easily detectable. Further research and advancements in observational cosmology are needed to shed light on this aspect of the Kalpa-Pralaya cycle.

Notes

1. Current estimate of the Life of the Universe
2. Could the Universe be 26.7 billion years old?
3. David R. Soderblom, "The Ages of Stars," *Annual Review of Astronomy and Astrophysics* 48, no. Volume 48, 2010 (2010), https://doi.org/https://doi.org/10.1146/annurev-astro-081309-130806, https://www.annualreviews.org/content/journals/10.1146/annurev-astro-081309-130806. 11

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4. Eduardo F. del Peloso a1a, Licio da Silva a1, Gustavo F. Porto de Mello and Lilia I. Arany-Prado (2005), "The age of the Galactic thin disk from Th/Eu nucleocosmochronology: extended sample" (Proceedings of the International Astronomical Union (2005), 1: 485-486 Cambridge University Press)
5. Anastasia V. Kasparova et al., "The diversity of thick galactic discs," *Monthly Notices of the Royal Astronomical Society: Letters* 460, no. 1 (2016), https://doi.org/10.1093/mnrasl/slw083, https://doi.org/10.1093/mnrasl/slw083.
6. Audrey Bouvier and Meenakshi Wadhwa, "The age of the Solar System redefined by the oldest Pb–Pb age of a meteoritic inclusion," *Nature Geoscience* 3, no. 9 (2010/09/01 2010), https://doi.org/10.1038/ngeo941, https://doi.org/10.1038/ngeo941.
7. Acceleration of Expansion of the Universe
8. Richard D'Souza and Eric F. Bell, "The Andromeda galaxy's most important merger about 2 billion years ago as M32's likely progenitor," *Nature Astronomy* 2, no. 9 (2018/09/01 2018), https://doi.org/10.1038/s41550-018-0533-x, https://doi.org/10.1038/s41550-018-0533-x.
9. Collision of Galaxy Messier 82 with M 81

References

Bouvier, Audrey, and Meenakshi Wadhwa. "The Age of the Solar System Redefined by the Oldest Pb–Pb Age of a Meteoritic Inclusion." *Nature Geoscience* 3, no. 9 (2010/09/01 2010): 637-41. https://doi.org/10.1038/ngeo941.

D'Souza, Richard, and Eric F. Bell. "The Andromeda Galaxy's Most Important Merger About 2 Billion Years Ago as M32's Likely Progenitor." *Nature Astronomy* 2, no. 9 (2018/09/01 2018): 737-43. https://doi.org/10.1038/s41550-018-0533-x.

Glazebrook, Karl, Roberto G. Abraham, Patrick J. McCarthy, Sandra Savaglio, Hsiao-Wen Chen, David Crampton, Rick Murowinski, et al. "A High Abundance of Massive Galaxies 3–6 Billion Years after the Big Bang." *Nature* 430, no. 6996 (2004/07/01 2004): 181-84. https://doi.org/10.1038/nature02667.

Kasparova, Anastasia V., Ivan Yu Katkov, Igor V. Chilingarian, Olga K. Silchenko, Alexey V. Moiseev, and Svyatoslav B. Borisov. "The Diversity of Thick Galactic Discs." *Monthly Notices of the Royal Astronomical Society: Letters* 460, no. 1 (2016): L89-L93. https://doi.org/10.1093/mnrasl/slw083.

Soderblom, David R. "The Ages of Stars." *Annual Review of Astronomy and Astrophysics* 48, no. Volume 48, 2010 (2010): 581-629. https://doi.org/https://doi.org/10.1146/annurev-astro-081309-130806. https://www.annualreviews.org/content/journals/10.1146/annurev-astro-081309-130806.