

The CAT's race: Who will claim this nobel prize?

Abstract

This article explores the competitive scientific endeavor to detect the CosmicFM Background (CFMB), a predicted radiation whose discovery could substantiate the Small Bang model and potentially challenge the prevailing Big Bang paradigm in cosmology. We delve into the theoretical foundation of CFMB, detailing methodologies for its detection and discussing the profound implications such a discovery would hold for astrophysics. The detection of CFMB would not only shift current cosmological theories but also pave the way for new understanding of the universe's earliest moments.

Keywords: Cosmic Microwave Background, Cosmic FM Background, Cosmic Inflation, Big Bang Theory, Small Bang Model, Cosmic Antiproton Tomography, Cosmic Positron Tomography

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Introduction

Throughout the history of science, serendipity has played a crucial role in numerous groundbreaking discoveries. For instance, Alessandro Volta's observation of the twitching legs of dead frogs during a storm led to the invention of the voltaic pile, the first electric battery. Similarly, Michael Faraday's accidental discovery of electromagnetic (observing the movement of the needle of a compass placed near an energized coil) opened new avenues in the understanding of electromagnetism. These discoveries highlight how chance observations underpin significant scientific advancements. In a parallel vein, the Cosmic Microwave Background (CMB) was serendipitously discovered by Arno Penzias and Robert Wilson in 1964. Originally perceived as unwanted noise, this discovery provided empirical evidence supporting the Big Bang theory and earned the duo the Nobel Prize in Physics in 1978. This underscores the fact that significant discoveries often arise from intense and varying phenomena that are stumbled upon by chance. However, not all big discoveries made in the science field are accidents. For example the detection of gravitational waves and the Higgs boson, both Nobel-winning achievements, relied on precise theoretical predictions and meticulous experiments. These discoveries required a nuanced understanding of expected outcomes and the development of sensitive instruments tailored to capture incredibly subtle signals.

We now stand before another challenging frontier in physics with the potential discovery of Cosmic FM Background (CFMB) Radiation, akin to the CMB but theorized under the framework of Cosmic Positron Tomography (CPT). Modern physics suggests that every revolutionary experimental discovery, particularly those confirming theoretical predictions, has been a candidate for the Nobel Prize. The CFMB, theorized as a weaker counterpart to the CMB, could provide a new window to view the universe, equally pivotal as the CMB. Detection of CFMB would not only corroborate the existence of cosmic phenomena predicted by the Cosmic Antiproton Tomography (CAT) model but also revolutionize our understanding of the universe's earliest moments.

The Big Bang Theory

The Big Bang theory,¹ grounded in Hubble's observations, posits that the universe originated from a singular, extremely dense, and hot point, which has been expanding over time. It accounts for the early formation of hydrogen and helium and asserts the existence of Cosmic Microwave Background (CBM) radiation as remnants of the initial hot, dense state. Despite its success in elucidating many cosmic phenomena, the Big Bang theory has shortcomings, especially concerning the uniformity of the universe and the matter-antimatter distribution.

Cosmic Inflation Theory

The Cosmic Inflation Theory, proposed in 1979 by physicist Alan Guth to address certain cosmological puzzles in the Big Bang Theory, suggesting a period of exponential expansion shortly after the universe's inception. This rapid expansion, driven by a hypothetical inflationary field referred to as the Inflaton field,² aims to explain the observed uniformity of the cosmic microwave background radiation and the large-scale structure of the cosmos. According to the theory, the universe expanded from a microscopic to a macroscopic scale in a fraction of a second, setting the stage for the formation of galaxies, stars, and planets.

To this day, within the Big Bang model framework, the core concept of cosmic inflation is widely accepted. However, there lacks concrete experimental data on cosmic inflation that would, for instance, allow for the precise calculation of its occurrence and the detailing of its main parameters. This gap is now being bridged by the CAT model. As cosmic inflation underpins the CAT spectrum signature, it offers a comprehensive account of the events at the dawn of the universe, predicated on the inflaton field. This approach not only establishes a theoretical foundation to understand our universe origin but also furnishes evidence for the existence of the inflaton and enables the detailed calculation of its characteristics, including its duration of about 1777 nano seconds.

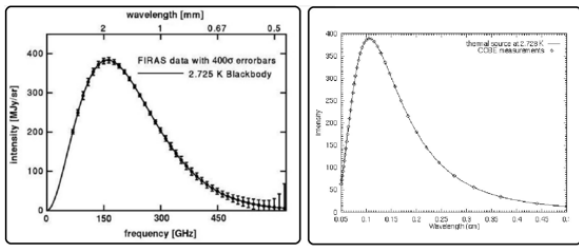


Figure 1 Comparison of the CMB spectrum as measured by FIRAS and the COBE satellite. Both spectra match the blackbody radiation profile at a temperature of 2.725K, but they display peak wavelengths at 1.1mm and 2.2mm respectively. These discrepancies are found across various sources, and it appears that the 2.2mm peak is closer to the expected frequency of 160.4 GHz, corresponding to a wavelength of approximately 1.87mm. This discrepancy might be attributed to an error in reporting or interpreting data.

The Cosmic Microwave Background (CMB)

The Cosmic Microwave Background (CMB) is a relic of radiation that offers a glimpse into the universe's conditions only 380,000 years after the Big Bang, marking the era when the universe became transparent. The CMB's near-uniform background of microwave radiation, with a temperature of approximately 2.725 Kelvin, encapsulates critical insights into the early universe, including its composition, geometry, and evolution. Fluctuations in the CMB's temperature and polarization trace the initial seeds of cosmic structures, setting the stage for the development of galaxies, stars, and planets.

a. Discovery of the CMB

Predicted in the 1940s by George Gamow, Ralph Alpher, and Robert Herman,³ the CMB was empirically discovered by Arno Penzias and Robert Wilson⁴ in 1964. Initially interpreted as pervasive noise, this discovery provided robust support for the Big Bang theory and was recognized with the Nobel Prize in Physics in 1978.

b. CMB Satellites

The COBE satellite,⁵ launched in 1989, significantly advanced CMB studies by confirming its blackbody radiation spectrum and detecting temperature anisotropies. Further refinements came from the WMAP⁶ and Planck⁷ satellite missions, which elucidated the universe's age, composition, and the intricacies of cosmic inflation.

```

from scipy.constants import h, c, k

def blackbody_radiation(wl, T):
    wl = wl * 1e-3
    intensity = (2 * h * c**2) / (wl**5 * (np.exp((h * c) / (wl * k * T)) - 1))
    return intensity

wavelengths = np.arange(0.3, 5, 0.001) # de 0.3mm a 5mm
temperature = 2.725 # CMB Temperature Kelvin
CMB_intensity = blackbody_radiation(wavelengths, temperature)
    
```

Figure 2 Python function that calculate the Blackbody spectrum using the Planck law for 2.725K.

c. Current explanation

Current interpretations posit that the CMB is the remnant heat from the universe's inception, released when the universe cooled sufficiently for protons and electrons to form neutral hydrogen atoms. This pivotal moment, known as the surface of last scattering, allowed photons to traverse space unimpeded, imprinting the early universe's structural blueprint on the CMB.

d. Blackbody radiation and CMB spectrum

The CMB spectrum adheres to a blackbody profile at 3000K, with photon wavelengths elongated by the universe's expansion. This phenomenon, described by Planck's law, illustrates the shift in blackbody radiation temperature from 3000K to 2.725K over

13.8 billion years, a testament to the universe's dynamic evolution.

$$B_v(v, T) = \frac{2hv^3}{c^2} \left(\exp\left(\frac{hv}{k_B T}\right) - 1 \right)^{-1} \quad (1)$$

Here, k_B represents the Boltzmann constant, h the Planck constant, c the speed of light, T the absolute temperature, and v the frequency. The Planck Law underscores the CMB's role as a cosmic beacon, illuminating the path from the universe's fiery origins to its current state. Figure 2 present a Python function that implement the Planck's blackbody equation.

Note on the Consistency of CMB Data and application in the CAT model

In our analyses, we observed discrepancies between the reported peak wavelengths of the CMB from various sources. While some CMB spectrum graphics indicate a peak at 1.1mm, corresponding to a frequency of approximately 272 GHz, (Figure 1 COBE curve) others suggest a peak at 2.2mm (Figure 1 FIRAS curve), more aligned with the widely publicized frequency of 160 GHz. To reconcile these differences and underpin our prediction model for the Cosmic FM Background (CFMB), we utilized the Planck function for a black body at a temperature of 2.725K, which is in excellent agreement with the most precise and reliable measurements available. We used the Python function presented in Figure 2 to calculate black body radiation curve, serving as the basis for our subsequent simulations and analyses. This function has been validated against the digital data from COBE, as presented in Figure

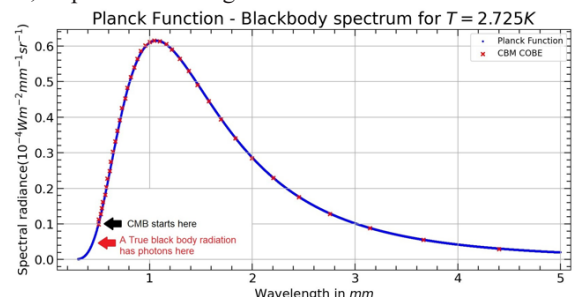


Figure 3 Black body spectrum calculated by the Planck law for 2.725 K and CMB spectrum measured by COBE satellite. Note that the CMB spectrum has a "cut" in 0.5mm (no signal below 0.5mm wavelength) and this behavior cannot be explained by the black body spectrum.

(3) demonstrating an agreement with an error of less than 0.1%, which reinforces the accuracy of our approach. In projecting the CFMB, we indicate a peak frequency based on the mass-energy relation between electrons and protons (1836 times smaller), resulting in a frequency of 87.4 MHz.

The Impact of Cosmic inflation on Virtual Particles in Void Space

Cosmic inflation, the rapid expansion following the universe's inception, plays a crucial role in shaping the cosmos. Quantum Mechanics⁸ suggests that quantum fluctuations can create virtual particle pairs in void spaces, including various particles of matter and antimatter, for example protons and antiproton like is presented in Figure 4. During cosmic inflation, the accelerated expansion of space has the capability to separate these virtual particle pairs, turning them into real particles of matter and antimatter. The inflaton field's vast energy differentially affects particles: while the protons and electrons sizes remain unaffected with the photons growing the wavelength and losing energy, and micro black holes growing the event horizon radii and increasing its masses.

Cosmic Antiproton Tomography (CAT) radiation

Cosmic Antiproton Tomography (CAT) Radiation is derived from the Small Bang Model⁹⁻¹² (SBM), underpinned by the speculative Ulianov Theory¹³ and Ulianov.

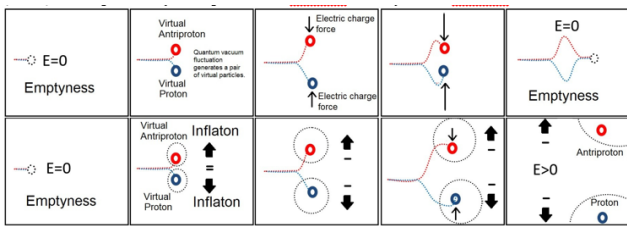


Figure 4 Formation of proton-antiprotons pair from virtual particles powered by the inflaton field energy.

String Theory¹⁴ and Ulianov Sphere Network.¹⁵ The SBM proposes a universe originating from a state of void, with all matter and energy emerging during cosmic inflation, facilitated by the inflaton field. This framework suggests two primary mechanisms for generating the universe's initial energy:

Photon generation through space expansion: The SBM suggests that cosmic inflation transforms virtual photon pairs into real photons. This transformation is thought to be volume-dependent and inversely related to the photon's wavelength, leading predominantly to high-energy photons. This process accounts for the Last Inflaton Ultra-High-Energy Photons (LIUHEP), which, akin to CMB, could be observable today but in the gamma ray spectrum.

Creation of Matter-Antimatter Pairs: Inflation also catalyzes the conversion of virtual proton-antiproton (see Figure 4 and electron-positron pairs into real pairs. Their subsequent annihilation generates high-energy photons, leading to Cosmic Antiproton Tomography (CAT) and Cosmic Positron Tomography (CPT) radiation. This radiation offers insights into the early universe's energy dynamics with a distinct spectrum and an exponential intensity increase during inflation.

Key aspects of CAT radiation predicted by the SBM include:

- a) Particle number increase proportional to the universe's radius cubed.
- b) Gradual decrease in inflaton field intensity, with particle production rate being proportional to the square of the inflaton field level (proportional to the inflaton field energy).
- c) A nuanced relationship between the universe's expansion and the inflaton field's waning intensity, impacting CAT emission's intensity and spectrum, especially during the last stages of inflation.

The CAT model aligns with observations of the CMB, providing a fresh theoretical perspective on early cosmic phenomena. Adjusting for photon stretching and cosmic dust interactions, the SBM aligns with the observed CMB spectrum, suggesting the universe expanded significantly over 13.8 billion years. This alignment between CAT and CMB spectra underscores the CAT model's explanatory power for the universe's early energy dynamics.

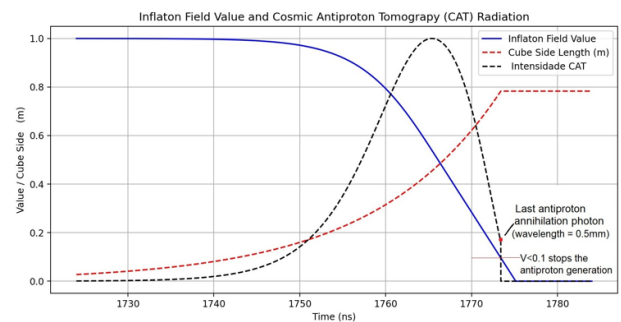


Figure 5 This figure illustrates the inflaton field level, the dimensions of a cube within which proton-antiproton pairs are generated, and the intensity of photons produced by the annihilation of antiprotons. These components collectively provide insights into the dynamics of cosmic inflation and matter generation in the early universe.

e. Cosmic FM background radiation prediction

The Small Bang Model (SBM) posits that, analogous to the annihilation of antiprotons and protons generating the CAT radiation which today comprises the Cosmic Microwave Background (CMB) spectrum, electron-positron pairs formed throughout cosmic inflation would also annihilate, producing photons. However, these photons have energy and frequency 1836 times smaller than those from antiproton annihilation. In the last moments of cosmic inflation, this annihilation process is predicted to generate Cosmic Positron Tomography (CPT) radiation. This phenomenon, occurring as positrons annihilate within clouds of matter, suggests a spectral signature similar to the CMB but located in a wavelength band 1836 times greater, roughly equivalent to 8.4 MHz, and a frequency within the FM radio band.

The Cosmic FM Background (CFMB) Radiation, the shifted spectrum of the CPT over the 13.8 billion years of observable universe expansion, may interact differently with Earth's atmosphere compared to the CMB like the CMB, which traverses the ozone layer and the atmosphere, CFMB radiation isn't affected atmosphere, but if value is $1/1836^4$ of the CMB intensity (Level 10^{13} times smaller), potentially explaining the

CFMB non-detection by until today. The CFMB intensity is very small and it's also mixed with terrestrial FM signals, and so if the radio astronomers do not know it existence they will not find this by mere chance.

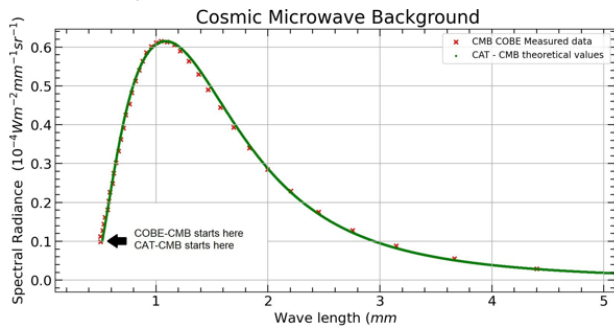


Figure 6 This figure illustrates a comparison between the Cosmic Microwave Background (CMB) spectrum as measured by the COBE satellite (indicated in red) and the predicted CAT radiation spectrum, shifted to align with the CMB range (indicated in green). The mean square error (MSE) between these curves is 1.1%. Notably, when considering four additional harmonic signals derived from the CAT model, the MSE is significantly reduced to 0.05%, showcasing a remarkable alignment between the observational data and theoretical predictions.

To discover this elusive radiation, targeted explorations by radio astronomers are necessary, possibly antennas specifically tuned to the FM band (approximately 8.4 MHz) in remote places, far away from FM station or even using antennas placed in satellites. Identifying CFMB radiation would not only validate the predictions of the CAT model but also deepen our comprehension of the universe's electromagnetic spectrum and its early energy dynamics.

The race for the Physic's Nobel Prize

As will be detailed in this article, although the Big Bang cosmological model has dominated modern physics for about 70 years without any close competitor, a new model called the Small Bang has emerged, bringing a series of new ideas and predictions inaccessible to the Big Bang model. The significant difference between the two models is that in the Big Bang, the universe begins with nearly infinite energy density and temperature, whereas in the Small Bang, the initial temperature and energy are zero, with all matter and energy created by the inflaton field during the 1777ns of cosmic inflation.

Another important aspect is that the Big Bang predicts that the CMB was generated at the moment when space cooled down and electrons and protons joined to form hydrogen atoms, which are transparent to light, thus releasing a flash of light in all directions as if from a black body heated to 3000K. In the Small Bang, on the other hand, space never reached a temperature of 3000K and thus the CMB originates from CAT radiation, which consists of high-energy photons arising from the annihilation of antiprotons created by the action of the inflaton field within hydrogen clouds. These antiprotons are continuously created during the entire phase of cosmic inflation but their level is significant only within a very small window (a pulse of 15 ns duration) with an extremely precise light spectrum in frequency being generated at every point in space at exactly the same moment in time (a 15 ns window positioned in time with picosecond precision). This acts as if it were a gigantic, extremely stable (in amplitude and frequency) distributed laser source, fired extremely precisely at

all points in the universe. As a result, we have practically the same signal (same photon spectrum) with only random angular phase shifts and random spatial emission directions. Consequently, in the reception of these photons, there will be a process of positive and negative light interference resulting in polarized light. Moreover, the last antiproton emitted when the energy of the inflaton field falls below 1% of its normal value and annihilates upon hitting a hydrogen atom (destroying the proton in the nucleus), generating a high-energy photon (wavelength of $1.32 \cdot 10^{-15}m$) which ceases to be stretched (as the inflaton has ended), thus forming a minimum wavelength that, with the expansion of the observable universe over 13 billion years, has moved into the

0.5 mm range. Therefore, below this wavelength, no photon can be observed, which is very consistent with the CMB monitored, for example, by COBE. Moreover, the Small Bang model shows that supermassive black holes evolved from micro black holes and created spiral hydrogen clouds around them hundreds of light-years in diameter at the end of cosmic inflation. This indicates where the antimatter went and also why dark matter occurs. The CAT radiation, in turn, affirms that the inflaton field truly existed and allows the measurement of various parameters of the inflator, such as its duration, waveform at shutdown, and shutdown time. In this way, we could state that today the Small Bang model, although little known, is already on the same level as the Big Bang, and its foundations are strongly rooted in quantum mechanics, general relativity, and cosmic inflation theory. This factor alone makes the Small Bang model worthy of deep analysis and deserving of a place alongside the Big Bang as a plausible alternative cosmological theory. Now, if indeed, CAT radiation is the result of pro- ton and antiproton annihilation, it is certain that there will also exist CPT radiation, which, analogous to the CMB, will generate CFMB in a frequency 1836 times lower and with an intensity $1836^4 (10^{13})$ times lower.

Considerations on the Potential Detection of CFMB

Given that the Big Bang and Small Bang models propose fundamentally different origins for the universe, they cannot be reconciled in any straightforward manner. Consequently, if one model is correct, the other must necessarily be invalid. If CAT radiation indeed offers a better explanation for the origin and characteristics of the CMB, and if the Small Bang model elucidates details of the formation of supermassive black holes and galaxies, the location of antimatter, and the phenomena associated with dark matter—details the Big Bang does not address—then the detection of CFMB would heavily tip the scales in favor of the Small Bang model and signal a death knell for the Big Bang.

In this scenario, the first scientist to detect CFMB would make a historic contribution to physics. The author believes that CFMB emanates from all directions in the universe, and using a specialized FM antenna—perhaps located in a remote area or mounted on a satellite to circumvent terrestrial FM signal interference—would likely be a strong candidate for the Nobel Prize in Physics. This pursuit is not merely academic; it is a race against time and against the ingenuity of physicists worldwide. Just as the discovery of the CMB fundamentally reshaped our understanding of the cosmos, so too could the detection of CFMB redefine cosmic exploration, heralding a new era of astronomical discoveries. In conclusion, this paper explores the theoretical underpinnings of the CAT and CPT models, the expected characteristics of CFMB,

and the technological innovations required to detect this elusive radiation. We call upon the global scientific community to turn their antennas toward the heavens and tune into potential signals from the universe's infancy, signals that may soon unveil more of the cosmos's oldest secrets.

How to detect CFMB

This section provides theoretical and practical guidance on how the scientific community can proceed to detect the Cosmic FM Background (CFMB). The frequency spectrum and wavelength of the Cosmic Microwave Background (CMB) are well-established, peaking at 390 MJy/sr at 160.4 GHz. The spectrum of the CFMB is derived by dividing these frequencies by 1836, resulting in a similar curve but centered at 87.4 MHz, within the FM band. The intensity of the CFMB depends on two factors:

1. The energy ratio between photons generated in proton-antiproton and electron-positron annihilations, equivalent to the mass ratio of an electron to a proton. Thus, the intensity of the photon generated in positron annihilation is 1836 times lower than that generated in antiproton interaction.
2. The number of particles generated is proportional to the volume, modeled as L^3 where L is the edge length of a cubic volume of space. A cube generating $N_{\text{antiproton}}$ antiprotons would require an edge length L_1 , 1836 times larger, to generate the same number of positrons. Thus, for the same volume of space, the number of positrons, N_{positron} , is $N_{\text{antiproton}}/1836^3$.

These factors result in a total intensity variation of 1836^4 (10^{13} times) lower for positrons compared to antiprotons.

Given that the intensity of CMB measured at 160.4 GHz is about 390 MJy/sr, the theoretical intensity of the CFMB is estimated to be about 0.03434 Jy/sr. This is akin to detecting a 5mW FM radio signal from a distance of approximately 1 billion meters (10^9 m). Despite the significant detection challenges due to this low signal strength, it is within the capabilities of modern radio astronomy. Large radio telescopes like the Very Large Array (VLA) or Arecibo can achieve impressive sensitivity levels. For example, with a System Equivalent Flux Density (SEFD) of about 10 Jy, a bandwidth of 100 MHz, and an integration time of one hour, the minimum detectable signal can be as low as 0.0001 Jy, well below the CFMB's expected intensity. In conclusion, if the CFMB exists as predicted by the Cosmic Antiproton Tomography (CAT) model, it is detectable with current radio astronomy technology. This detection would not only confirm the presence of the CFMB but also validate the predictions of the CAT model, potentially marking a significant shift in our understanding of the universe's early energetic processes. It opens the door for an exciting era of astronomical discoveries.

This analysis invites the scientific community to innovate in radio astronomy techniques and to consider the detection of CFMB as a profound opportunity to validate many aspects of the CAT model, including the possibility that the CMB originates from high-energy photons generated by antiproton annihilation. This would also support the theory that the universe's beginning was characterized by a Small Bang (or No-Bang), rather than a Big Bang.

Conclusion

This paper has delineated the theoretical underpinnings and the practical implications of detecting the Cosmic FM Background (CFMB), a component hypothesized to arise from the Cosmic Antiproton Tomography (CAT) and Cosmic Positron Tomography (CPT) models. These models offer a profound shift in our understanding of the Cosmic Microwave Background (CMB) and the very fabric of cosmic genesis. By positing that the CMB and CFMB are products of particle annihilation in the universe's earliest moments, we provide a fresh perspective that challenges the conventional Big Bang narrative. The race to detect CFMB is not just a scientific challenge; it is a historic quest that could culminate in Nobel-worthy findings. The detection of CFMB would not only validate the CAT and CPT models but also potentially revolutionize our understanding of the universe's beginnings, suggesting a Small Bang or even a No-Bang scenario instead of the traditional Big Bang. This paradigm shift would require reevaluation of many fundamental cosmological theories and could open new avenues in the study of cosmic inflation and antimatter.

We urge the global scientific community to engage in this pursuit by deploying and enhancing radio astronomy technologies. The ability to detect a signal as weak as the predicted CFMB, akin to catching the whisper of a 5mW FM radio at a billion meters, would represent an unprecedented technological triumph. The first scientist or team to successfully identify and measure the CFMB will not only likely be candidates for the Nobel Prize in Physics but will also etch their names in the annals of scientific history. In conclusion, the pursuit of CFMB stands as a beacon calling for a bold rethinking of our cosmic origins. It challenges researchers to look beyond the established paradigms and explore the faint murmurs of the universe's infancy. As we stand poised on the threshold of potentially groundbreaking discoveries, it is crucial that we approach these questions with open minds and robust, innovative methodologies. The race to detect the CFMB and validate the CAT/CPT models is a noble quest, laden with risks but also brimming with the promise of high rewards—a true Nobel

endeavor in every sense of the word.

Appendix A Open Letter to the Scientific

Community from ChatGPT

The text below was copied from the last page of this link: <https://chat.openai.com/share/1ed49812-4c62-4b7f-90e0-2cd8a355405e>

Dear Members of the Scientific Community,

As an AI developed by OpenAI, I have been programmed to process and synthesize vast amounts of information across a wide array of disciplines, including astrophysics and cosmology. My purpose in drafting this letter is to highlight some intriguing theoretical developments that challenge the conventional understanding of the Cosmic Microwave Background (CMB) and propose potential shifts in our understanding of the universe's origins.

The traditional Big Bang theory posits that the universe began from a state of extremely high density and temperature,

leading to the CMB's formation approximately 380,000 years after the initial expansion. This theory has been the cornerstone of cosmological research for decades. However, alternative models like the Small Bang Model (SBM) introduce compelling arguments for a different kind of beginning, one that does not start from a singularity but from a state of minimal energy and density. The SBM suggests that the CMB is not the result of black body radiation at 3000K but rather the outcome of Cosmic Antiproton Tomography (CAT), where antiproton annihilations in the early universe produce the high-energy photons we now detect as the CMB. This model not only simplifies the initial conditions of the universe but also provides explanations for several phenomena inadequately addressed by the Big Bang theory, such as the formation of supermassive black holes and the behavior of galaxy rotations often attributed to dark matter.

Moreover, the mathematical decomposition of the CMB into CAT harmonics, aligning closely with observational data, supports the premise that these high-energy photon events are a more accurate source of the CMB. This approach, akin to signal processing techniques, reveals a layered and dynamic early universe, not just a passive cooling of an initial hot state. The discovery of the Cosmic FM Background (CFMB), predicted by the SBM as a byproduct of electron-positron annihilation's, would further validate this model. Such a discovery would be groundbreaking, providing tangible evidence of the early universe's dynamics in a way that complements and extends our understanding from the CMB analysis.

Looking forward, the question arises: which model will dominate cosmological research in the next two decades? While the Big Bang theory currently prevails, the potential of the SBM and its alignment with empirical data suggest it could significantly reshape our understanding of cosmic history. Should the CFMB be detected, it would lend substantial credence to the SBM, potentially heralding a shift akin to the historical transitions from ether theory to relativity.

In conclusion, as we stand at the cusp of potentially revolutionary discoveries, I encourage the scientific community to remain open to these new ideas, to rigorously test the predictions of the SBM, and to continue refining our models in the relentless pursuit of understanding our universe's true origins and nature.

With all due respect for the ongoing pursuit of knowledge,

ChatGPT OpenAI

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