

## **BICEP2 Fallacies**

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### **ABSTRACT**

This is the transcript of an interview [1] in which it is explained that the BICEP2 telescope located at the South Pole did not detect anything other than galactic noise. Despite reports with great fanfare, BICEP2 did not detect the signatures of Einstein gravitational waves or an inflationary epoch in some big bang expanding universe. The reports by the BICEP2 Team that they detected evidence for some big bang cosmology are demonstrably false.

BICEP2 is a telescope located in Antarctica, at the South Pole. This device is described as a polarimeter, because it is alleged to be able to detect polarizations in the so-called Cosmic Microwave Background (i.e. the CMB) due to Einstein gravitational waves generated by an inflationary epoch of some Big Bang universe. The report by the BICEP2 Collaboration that they detected polarisations in the alleged CMB is claimed to be evidence of both Einstein gravitational waves and a Big Bang inflationary epoch. However, BICEP2 has not detected Einstein gravitational waves and has not affirmed either an inflationary epoch or a Big Bang creation event.

Let's consider the salient issues other than the actual operation of the instrument and the methods of data collection utilised by the BICEP2 Collaboration.

- (a) On the basis of Big Bang cosmology theory the BICEP2 Collaboration assumes that the Universe spontaneously sprang into existence from nothing, or from a point possessing infinite density, infinite pressure and infinite hotness, called a singularity, although 'nothing' and 'singularity' are actually indistinguishable from one another since a point has no volume and thereby incapable of possessing density, pressure and hotness, let alone infinities thereof;
- (b) They assume an inflationary epoch in some Big Bang expanding universe;
- (c) They assume the existence of a Cosmic Microwave Background, the alleged afterglow of some Big Bang creation event;
- (d) They assume that they can separate the galactic foreground signal from the alleged CMB and the latter's multipoles;
- (e) They assume the existence of Einstein gravitational waves;
- (f) They allege that Big Bang cosmology predicts that primordial Einstein gravitational waves are generated during an inflationary epoch in the history of the Universe. In a paper titled 'BICEP2 I. DETECTION OF B-mode POLARIZATION AT DEGREE ANGULAR SCALES', Ade et al. [2] say that:

*“Inflationary cosmology extends the standard model by postulating an early period of nearly exponential expansion which sets the initial conditions for the subsequent hot big bang. ... A definitive test of this paradigm would be of fundamental importance. ... Gravitational waves generated by inflation have the potential to provide such a definitive test. Inflation predicts that the quantization of the gravitational field coupled to exponential expansion produces a primordial background of stochastic gravitational waves with a characteristic spectral shape. Though unlikely to be directly detectable in modern instruments, these gravitational waves would have imprinted a unique signature upon the CMB. Gravitational waves induce local quadrupole anisotropies in the radiation field within the last-scattering surface, inducing polarization in the scattered light. This polarization pattern will include a “curl” or B-mode component at degree angular scales that cannot be generated primordially by density perturbations. ... The detection of B-mode polarization of the CMB at large angular scales would provide a unique confirmation of inflation and a probe of its energy scale.”*

(g) The BICEP2 Collaboration reports a B-mode polarisation detection and hence claims detection of signature of primordial Einstein gravitational waves therein and confirmation thereby of an inflationary epoch for a Big Bang expanding universe.

The so-called Cosmic Microwave Background radiation is central to BICEP2. In particular the multipole components, or alleged anisotropies, in the CMB, assuming they exist, are very weak. In the paper ‘BICEP2 I. DETECTION OF B-mode POLARIZATION AT DEGREE ANGULAR SCALES’ Ade et al. reveal that “*The CMB is polarized with an amplitude of a few  $\mu\text{K}$ .*” It is noteworthy that the galactic foreground is in mK, i.e. the galactic foreground, which constitutes noise, is about 1000 times stronger than the alleged anisotropies sought after by BICEP2. In his papers ‘WMAP: A Radiological Analysis’, and ‘COBE: A Radiological Analysis’, both published in the journal *Progress in Physics*, Professor Pierre-Marie Robitaille has pointed out that laboratory experience attests that it is quite impossible to extract a signal that is some 1000 times weaker than the noise enveloping it unless the experimenter has at his disposal at least one of two options; a priori knowledge of the nature of the signal, or the ability to physically manipulate the signal source. Neither of these options is available to BICEP2. Consequently, as is precisely the case with the COBE, WMAP and *Planck* instruments, BICEP2 is incapable of removing the galactic foreground contamination.

In the same paper Ade et al. say that “*The discovery of the Cosmic Microwave Background (CMB) by Penzias & Wilson (1965) confirmed the hot big bang paradigm and established the CMB as a central tool for the study of cosmology. In recent years, observations of its temperature anisotropies have helped establish and refine the “standard” cosmological model now known as  $\Lambda\text{CDM}$ .*” Penzias and Wilson did not assign their signal at  $\sim 3\text{K}$  to the Cosmos. That was done immediately by theoreticians Dicke, Wilkinson, Peebles, and Roll, in the very same issue of the journal in which Penzias and Wilson published their findings in 1965. Furthermore, as Robitaille has emphasized, Penzias and Wilson violated the laws of thermal emission when they assigned a temperature to their residual signal. In addition, Robitaille, in a series of papers published in the journal *Progress in Physics*, has proven that Kirchhoff’s Law of Thermal emission is not universal. On both counts, assignment of a temperature to the Cosmos by means of thermal emission is inadmissible, even if

there is a Cosmic Microwave Background present. However, there is in fact no Cosmic Microwave Background.

If you put a glass of water in a microwave oven and turn it on, does the water reflect or absorb the microwaves? Anyone who has used a microwave oven knows that the water gets hot and if irradiated long enough will vaporise. That's why the oven is called a microwave oven. The same happens with a block of ice. Thus, water in all its phases absorbs microwaves. Consequently, water, in all its phases, also emits microwaves.

All detections of the monopole signal, i.e. the mean temperature, of the microwave background have been within the vicinity of Earth. There is a lot of water on Earth. About 70% of the Earth's surface is covered by water, and there is water in the atmosphere as well. In addition, the Earth's atmosphere scatters microwave radiation from these reservoirs of water. The instruments which have detected this monopole signal simply picked up microwave radiation from water on Earth, not from the Cosmos. BICEP2 observes from the ground, in Antarctica. Penzias and Wilson observed from the ground. The WMAP and *Planck* spacecraft were located 1.5 millions km from Earth at the Second Lagrange Point (L2). No monopole microwave signal has ever been detected outside the influence of Earth. The COBE, WMAP and *Planck* instruments have reported anisotropies in the CMB. However, since there is no CMB, there are no cosmic anisotropies either. The anisotropies reported are data-processing artefacts, merely ghost signals introduced by data-processing due to attempts to remove noise due to the galactic foreground and the dipole signal. Moreover, the *Planck* spacecraft didn't even operate as intended, because its two on-board 4K blackbody loads, used for signal comparison, are known to have been defective, and so did not function as blackbody radiation sources at any time in flight. In fact, the results reported by the *Planck* team actually confirm that there is no monopole signal at L2, owing to the defective 4K loads, as has been explained in detail by Robitaille in his paper 'The Planck Satellite LFI and the Microwave Background: Importance of the 4K Reference Targets', published in the journal *Progress in Physics*.

Since there is no Cosmic Microwave Background radiation there has been no detection of Einstein gravitational waves, primordial or otherwise, by BICEP2, and no affirmation of an inflationary Big Bang expanding universe whatsoever.

None of the dedicated gravitational wave detectors, such as LIGO, GEO, and Virgo, have ever detected Einstein gravitational waves. This is not surprising, because these waves are theoretical, obtained from Einstein's General Theory of Relativity, just as all Big Bang universes and all black hole universes have been obtained, and are easily proven to be false theoretical conclusions. Einstein's General Theory of Relativity is supposed to be coordinate independent and expressed in terms of mathematical entities called tensors. The wave equation obtained for Einstein's gravitational waves is however coordinate dependent, contrary to the requirement of Einstein's theory. In fact the speed of propagation of Einstein's alleged gravitational waves is variable with arbitrary changes of coordinates. If you pick a certain set of coordinates the speed of propagation is that of light in vacuum, but by picking other coordinates the speed of wave propagation is entirely different to that of light in vacuum. Einstein simply wanted his waves to propagate at the speed of light in vacuum and so he chose a set of

coordinates to make it so. There is no unique speed of propagation of Einstein's alleged gravitational waves. The claim by cosmologists that Einstein's gravitational waves propagate at the speed of light in vacuum is patently false. Furthermore, General Relativity violates the usual conservation of energy and momentum for a closed system and this also means that Einstein gravitational waves simply do not exist. The fact that the usual conservation laws are violated by General Relativity places it in conflict with much experiment, and is therefore untenable. Big Bang cosmology and black holes of course rely upon General Relativity, and so they have no valid basis either. Black hole binaries are also alleged to be sources of Einstein gravitational waves. An alleged black hole solution to Einstein's field equations constitutes a universe no less than does an alleged big bang solution to his field equations. However, General Relativity is an inconsistent theory and does not in fact predict black hole universes. In this regard consider the following.

All alleged black hole universes:

- (1) are spatially infinite,
- (2) are eternal,
- (3) contain only one mass,
- (4) are not expanding,
- (5) and are either asymptotically flat or asymptotically curved.

However, all alleged big bang universes:

- (1) are either spatially finite (in one case) or spatially infinite (in two different cases),
- (2) are of finite age (allegedly ~ 13.8 billion years),
- (3) contain radiation and many masses,
- (4) are expanding,
- (5) and are not asymptotically anything.

Thus, by their very definitions, black hole universes and big bang universes can't coexist – they are mutually exclusive. No black hole universe can be superposed with any big bang universe, or with any other black hole universe, including itself. Likewise, no big bang universe can be superposed with any other big bang universe or with any black hole universe, or with itself. Despite this fact the cosmologists superpose everything to generate anything they please. BICEP2 is incapable of affirming a theory that is false because nothing can validate a false theory.

BICEP2 has not detected Einstein gravitational waves and has not substantiated some Big Bang creation event and inflation of the Universe in any way whatsoever. The BICEP2 Collaboration has just done the usual in cosmology; interpreted things in terms of wishful thinking.

## REFERENCES

- [1] Crothers, S. J., BICEP2 Fallacies, *Thunderbolts Project*, 5 May 2014, [https://www.youtube.com/watch?v=hC\\_KkLvG22A](https://www.youtube.com/watch?v=hC_KkLvG22A)
- [2] Ade, P. A. R., et al, BICEP2 I: DETECTION OF B-mode POLARIZATION AT DEGREE ANGULAR SCALES, 18 Mar 2014, <http://arxiv.org/abs/1403.3985>