

**SUPPLEMENTARY NOTES TO MY PAPER**  
**“The Theological Basis of Big Bang Cosmology and the Failure of General Relativity”**

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**ABSTRACT**

These notes constitute a supplement to my paper ‘The Theological Basis of Big Bang Cosmology and the Failure of General Relativity’ and should therefore be read after that paper.

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Let us emphasize the correspondence of equation (4) on page 7 of my paper for the total energy and momentum of the gravitational field given by Einstein, with equation (6) on page (8) of my paper and the mixed-tensor form of equation (6) also on page (8). Here again is equation (4):

$$\mathfrak{E} = (t_{\mu}^{\sigma} + T_{\mu}^{\sigma})$$

and here again is equation (6):

$$\frac{G_{\mu\nu}}{\kappa} + T_{\mu\nu} = 0$$

The mixed-tensor form of equation (6) is:

$$\frac{G_{\nu}^{\mu}}{\kappa} + T_{\nu}^{\mu} = 0$$

Let’s compare this to equation (4) in the form:

$$(t_{\mu}^{\sigma} + T_{\mu}^{\sigma}) = \mathfrak{E}$$

Even better let’s put them side by side:

$$\frac{G_{\nu}^{\mu}}{\kappa} + T_{\nu}^{\mu} = 0 \qquad (t_{\mu}^{\sigma} + T_{\mu}^{\sigma}) = \mathfrak{E}$$

Now we can easily see that the expression on the left is not only the correct form of Einstein's field equations but it is also the equation for the total energy and momentum of his gravitational field. The terms  $G_{\nu}^{\mu} / \kappa$  are the components of a gravitational energy tensor in place of Einstein's meaningless pseudo-tensor  $t_{\mu}^{\sigma}$ . Einstein incorrectly supposed that his  $\mathfrak{E}$  is not zero on account of his definition of his pseudo-tensor  $t_{\mu}^{\sigma}$  in his attempt to produce the usual conservation laws. But as proven in my paper, Einstein's pseudo-tensor is a meaningless concoction of mathematical symbols and so his expression for  $\mathfrak{E}$  is totally meaningless and hence the ordinary divergence of it also totally meaningless so that his alleged conservation of energy and momentum in his gravitational field is totally false. The tensor divergence of the left side of the correct form of Einstein's field equations is zero and so energy and momentum are conserved, but the total energy is ALWAYS zero, and so his field equations violate the usual conservation of energy and momentum as explained in my paper, and so they are invalid. Thus the Big Bang is also invalidated, as is Einstein's gravitational waves, and all the alleged putative tests of General Relativity are invalidated because the theory is false.

There is now much made of the 'cosmological constant'  $\Lambda$ , first quite arbitrarily introduced by Einstein. Including this term Einstein's field equations are written by him and his followers as:

$$G_{\mu\nu} + \Lambda g_{\mu\nu} = -\kappa T_{\mu\nu}$$

Also, in his book, 'The Meaning of Relativity' in the Appendix for the Second Edition, "On the 'cosmologic problem'", Einstein writes his field equations with 'cosmological constant' as follows:

$$(R_{ik} - \frac{1}{2} g_{ik} R) + \Lambda g_{ik} + \kappa T_{ik} = 0$$

and he says, *"where  $\Lambda$  is a universal constant ('cosmologic constant'). The introduction of this second member constitutes a complication of the theory, which seriously reduces its logical simplicity. Its introduction can only be justified by the difficulty produced by the almost unavoidable introduction of a finite average density of matter."*

In his book 'Relativity Thermodynamics and Cosmology', R. C. Tolman says of this form of the field equations that they connect *"the energy-momentum tensor with the geometry of space-time."*

We will write the field equations with cosmological constant more simply using the Einstein tensor  $G_{\mu\nu}$  thus:

$$G_{\mu\nu} + \Lambda g_{\mu\nu} + \kappa T_{\mu\nu} = 0$$

We can see the cosmological constant is an *ad hoc* and rather vague augmentation to Einstein's field equations. Its physical meaning is consequently also rather vague and so it is just a mathematical curiosity that has no real justification for being present. Einstein introduced it to maintain a static Universe. In his paper 'The Cosmological Constant', (arXiv:astro-ph/0004075v2 8 Apr 2000 ) Sean M. Carroll makes the following remarks:

*“The cosmological constant  $\Lambda$  is a dimensional parameter with units of  $(\text{length})^{-2}$ . From the point of view of classical general relativity, there is no preferred choice for what the length scale defined by  $\Lambda$  might be. Particle physics, however, brings a different perspective to the question. The cosmological constant turns out to be a measure of the energy density of the vacuum — the state of lowest energy — and although we cannot calculate the vacuum energy with any confidence, this identification allows us to consider the scales of various contributions to the cosmological constant.”*

First, particle physics bears no relation to General Relativity and so invoking particle physics to interpret the cosmological constant is inadmissible. Second, vacuum energy is a meaningless concept. Third, we note that the cosmological constant is not a source for Einstein's gravitational field and so it bears no relation to the energy-momentum tensor, as Tolman has pointed out. The cosmological constant can therefore only be associated with the curvature of spacetime, i.e. with the Einstein tensor. Fourth, in view of the analysis presented in my paper the field equations with cosmological constant MUST take the following form:

$$\frac{(G_{\mu\nu} + \Lambda g_{\mu\nu})}{\kappa} + T_{\mu\nu} = 0$$

where the  $(G_{\mu\nu} + \Lambda g_{\mu\nu})/\kappa$  are now the components of a gravitational energy tensor. Note that this equation is both the correct form of the field equations with cosmological constant and is also a total energy and momentum expression for Einstein's gravitational field. We can also write this equation in mixed-tensor form and compare it to Einstein's original expression for the total energy and momentum of his gravitational field, thus:

$$\frac{(G_{\nu}^{\mu} + \Lambda g_{\nu}^{\mu})}{\kappa} + T_{\nu}^{\mu} = 0 \quad (t_{\mu}^{\sigma} + T_{\mu}^{\sigma}) = \mathfrak{E}$$

The tensor divergence of the left side of the first equation is again zero and so energy and momentum are conserved, but once again the total energy and momentum is ALWAYS zero, and so once again the usual conservation of energy and momentum is violated, placing the augmented field equations in conflict with experiment on a deep level yet again and therefore invalid still. So the addition of the cosmological constant changes nothing – General Relativity is still invalid. Consequently the Big Bang

*creatio ex nihilo* and Einstein's gravitational waves are also fallacious and the black hole too a phantasm and the alleged putative validations of General Relativity without scientific basis since General Relativity is physically and mathematically inconsistent and therefore fallacious.

In their article 'A Brief History of Stephen Hawking', (Reader's Digest Magazine, September 1993, pp.135-159), M. White and J. Gribbin remark on page 152:

*"The background radiation from the big Bang, discovered by the two radio astronomers in 1965, was worrying because it was exactly the same temperature (about minus 270 degrees) in every direction.*

*"This implied that the Big Bang was perfectly smooth and uniform. But Hawking, and others, predicted that for clouds of gas to form – which would then contract, cool and be clumped together by gravity into galaxies – the explosion must have contained fluctuations.*

*"It was only a prediction. Hawking joined in the sigh of relief among cosmologists in April last year when the COBE (Cosmic Background Explorer) satellite, launched by NASA, reported distant ripples or fluctuations in the cosmic radiation 15 billion years ago at the time of the Big Bang.*

*" 'They are the kind of fluctuations predicted,' says Hawking, 'and tremendously important.' If COBE hadn't found them, the whole Big Bang theory might have had to be rejected.' "*

Now in my article, COBE and WMAP: Signal Analysis by Fact or Fiction? *Electronics World*, March 2010, (<http://vixra.org/abs/1101.0009> ) I made the following remarks in relation to Smoot's *wrinkles in spacetime* (Smoot G. and Davidson K. *Wrinkles in time: witness to the birth of the Universe*, Harper Perennial, New York, N.Y., 1993):

*'George Smoot, the principal investigator for the COBE Differential Microwave Radiometers (DMR), relates that to extract the weak multipoles by data processing, which Smoot calls "wrinkles in the fabric of time" [5], required first the removal of the dipole, galactic foreground, and the quadrupole signals. Smoot puzzled over why the multipoles did not appear until the quadrupole was finally removed by data processing methods, since the raw data contained no systematic signal variations. Robitaille's answer is simple: "when Smoot and his colleagues imposed a systematic removal of signal, they produced a systematic remnant. In essence, the act of removing the quadrupole created the multipoles and the associated systematic anisotropies" [8]. Smoot's "wrinkles in the fabric of time" are nothing more than consistent residual ghost signals produced by his data processing. The appearance of such systematic ghost signals throughout an image when processing large*

contaminating signals is very well known in medical radiology. Robitaille advises that *“Apparent anisotropy must not be generated by processing”.*

So we see that the fluctuations Hawking refers to in the Reader’s Digest article are nothing but Smoot’s ghost signals, anisotropies produced as artefacts of his signal processing methods, and so they are not data!

Thus the Big Bang is invalidated on empirical grounds by Pierre-Marie Robitaille and on theoretical grounds in my papers.

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Crothers, S. J. The Theological Basis of Big Bang Cosmology and the Failure of General Relativity, <http://vixra.org/abs/1403.0953>