

Exploration

Thinking Out Loud on Primeval Atom, Big Bang & Biblical Account of Creation

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Abstract

In recent years, the Big Bang as described by the Lambda CDM-Standard Model Cosmology has become widely accepted by majority of physics and cosmology communities. Some people even have concluded that it has no serious alternative in horizon. Is that true? First, as we argued elsewhere, Big Bang relies on singularity, so, when we are able to describe the observed data without invoking singularity, then Big Bang model is no longer required. In this paper, we explore a few alternatives other than Big Bang which most cosmologists believe is the closest to biblical account of creation. We argue that re-reading of Genesis 1:2 will lead one to another viable model, albeit it has not been developed rigorously as LCDM theories. We also briefly discuss a fluid Maxwell equations of Tsutomu Kambe based on vortex sound theory.

Keywords: Electromagnetic theory, Maxwell, fluid, singularity-free, cosmology model, vortex sound theory, early Universe, Genesis, Spirit, Creation.

1. Introduction

One of the biggest mysteries in cosmogony and cosmology studies is perhaps: *How to interpret properly Genesis chapter 1:2*. Traditionally, philosophers proposed that God created the Universe out of nothingness (from reading “empty and formless” and “*bara*” words; this contention is called “*creation ex nihilo*.”). Understandably, such a model can lead to various interpretations, including the notorious “cosmic egg” (primeval atom) model as suggested by Georges Lemaitre, which then led to Big Bang model.[18-20] Subsequently, many cosmologists accept it without asking, that Big Bang stands as the most faithful and nearest theory to Biblical account of creation. But we can ask: Is that cosmic egg model the true and faithful reading of Genesis 1:2?

In the subsequent chapter we will discuss how to answer this question by the lens of hermeneutics of Sherlock Holmes. This is a tool of mind which we think to be a better way compared to critical hermeneutics.

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Now a word on the meaning of thinking out loud phrase. What we mean with this phrase is, according to a definition:

Thinking out loud is the act of expressing in recoverable and external form new thoughts which you encourage your mind into exploring. Often these lead to new avenues of thought. When you **think out loud** you detect and explore ideas and concepts which are either unknown, or as yet unexplored.¹

2. Several different interpretations of Genesis 1:2 & implications

Our discussion starts from the fundamental question that one of us (VC) has heard around three years ago (January 2015). At the time, he (VC) had a good time of conversation with a senior pastor who happens to be one of the most leading scholars from Jakarta Theology and Philosophy Seminary, i.e. Dr. Joas Adiprasetya (JA). VC tried to explain to him his idea on interpreting of Prolegomena of John Gospel as one of reliable biblical account of creation. In essence, VC told JA that it appears possible to interpret the Logos (in John 1:1) as the Sacred Voice of God, then from voice we can infer sound wave, then from sound wave we can infer frequency. Therefore, we can infer that there should be primordial/relic sound wave which emerged at the earliest time of creation. [10-13] And Prof. Wayne Hu & Martin White has written a paper about observation of such relic sound wave.[21]

But JA asked him (VC): okay, then where was the role of Holy Spirit in that creation story based on John 1:1? VC should admit that at the time he cannot come up with a convincing answer. He only said: "I do not think of that yet."

And it took around three years before now we have been thinking this problem out loud, and here our answer can be summarized as follows: "The relic sound wave in early creation is a faithful interpretation of John 1:1, but we can come up with a more complete picture if we combine it with Gen. 1:2, that is the Holy Spirit came to hovering over the primordial fluid, then a kind of hurricane/storm started which created perfect medium where God spoke (Logos)."

Let us consider some biblical passages:

- What is *Hermeneutics of Sherlock Holmes*?

One article suggests:²

Holmes: "I have no data yet. It is a capital mistake to theorize before one has data.

Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."

¹ wiki.c2.com/?ThinkingOutLoud

² <https://www.str.org/blog/learning-hermeneutics-from-holmes>

Far too often students of the Bible (and cosmology folks as well) twist verses to suit interpretations instead of formulating interpretations to suit what the verses say.

Guide: Don't approach your passage assuming you know what it means. Rather, use the data in the passage – the words that are used and how they fit together – to point you toward the correct interpretation.

- A re-reading of Gen. 2:7 with Hermeneutics of Sherlock Holmes³

If we glance at Gen. 2: 7, we see at a glance that man is made up of the dust of the ground (*adamah*) which is breathed by the breath of life by God (*nephesh*). Here we can ask, does this text really support the Cartesian dualism view?

We do not think so, because the Hebrew concept of man and life is integral. The bottom line: it is not the spirit trapped in the body (Platonic), but the body is flowing in the ocean of spirit. [7]

Let's look at three more texts:

a. Gen. 1: 2, "*The earth is without form and void, darkness over the deep, and the Spirit of God hovering over the waters.*" Patterns such as Adam's creation can also be encountered in the creation story of the universe. Earth and the oceans already exist (similar to *adamah*), but still empty and formless. Then the Spirit of God hovered over it, in the original text "*ruach*" can be interpreted as a strong wind (storm). So we can imagine there is wind/hurricane, then in the storm that God said, and there was the creation of the universe. See also Amos Yong [6], also Hildebrandt [15]. From a scientific point of view, it is well known in aerodynamics that turbulence can cause sound (*turbulence-generated sound*). And primordial sound waves are indeed observed by astronomers.

b. Ps. 107: 25, "*He said, he raised up a storm that lifted up his waves.*" The relation between the word (sound) and the storm (turbulence) is interactive. Which one can cause other. That is, God can speak and then storms, or the Spirit of God causes a storm. Then came the voice.

c. Ezekiel. 37: 7, "*Then I prophesy as I am commanded, and as soon as I prophesy, it sounds, indeed, a crackling sound, and the bones meet with one another.*" In Ezekiel it appears that the story of the creation of Adam is repeated, that the Spirit of God is blowing (storm), then the sound of the dead bones arises.

³ Check Eric McKiddie's article: <https://www.thegospelcoalition.org/blogs/trevin-wax/10-tips-on-solving-mysterious-bible-passages-from-sherlock-holmes/>

The conclusion of the three verses above seems to be that man is made up of *adamah* which is animated by the breath or Spirit of God. He is not matter, more accurately referred to as spirit in matter. Like a popular song around 80s goes: "*We are spirits in the material world.*"

3. A physical model of turbulence-generated sound for early Universe

Our discussion starts from the fundamental question: how can we include the rotation in early Universe model? After answering that question, we will discuss how "turbulence-generated sound" can be put into a mathematical model for the early Universe. We are aware that the notion of turbulence-generated sound is not new term at all especially in aerodynamics, but the term is rarely used in cosmology until now. We shall show that 3D Navier-Stokes will lead to non-linear acoustics models, which means that a turbulence/storm can generate sound wave.

a. How can we include rotation in early Universe model?

It has been known for long time that most of the existing cosmology models have singularity problem. Cosmological singularity has been a consequence of excessive symmetry of flow, such as "Hubble's law". More realistic one is suggested, based on Newtonian cosmology model but here we include the vortical-rotational effect of the whole Universe.

In this section, we will derive an Ermakov-type equation following Nurgaliev [8]. Then we will solve it numerically using Mathematica 11.

After he proceeds with some initial assumptions, Nurgaliev obtained a new simple local cosmological equation:[8][9]

$$\dot{H} + H^2 = \omega^2 + \frac{4\pi G}{3} \rho, \quad (1)$$

where $\dot{H} = dH / dt$.

The angular momentum conservation law $\omega R^2 = \text{const} = K$ and the mass conservation law $(4\pi/3)\rho R^3 = \text{const} = M$ makes equation (5) solvable:[9]

$$\dot{H} + H^2 = \frac{K^2}{R^4} - \frac{GM}{R^3}, \quad (2)$$

or

$$\ddot{R} = \frac{K^2}{R^3} - \frac{GM}{R^2}. \quad (3)$$

Equation (3) may be written as Ermakov-type nonlinear equation as follows;

$$\ddot{R} + \frac{GM}{R^2} = \frac{K^2}{R^3}. \quad (4)$$

Nurgaliev tried to integrate equation (3), but now we will solve the above equation with Mathematica 11. First, we will rewrite this equation by replacing $GM=A$, $K^2=B$, so we get:

$$\ddot{R} + \frac{A}{R^2} = \frac{B}{R^3}. \quad (5)$$

As with what Nurgaliev did in [8][9], we also tried different sets of A and B values, as follows:

a. A and B < 0

A=-10;

B=-10;

ODE=x''[t]+A/x[t]^2-B/x[t]^3==0;

sol=NDSolve[{ODE,x[0]==1,x'[0]==1},x[t],{t,-10,10}]

Plot[x[t]/.sol,{t,-10,10}]

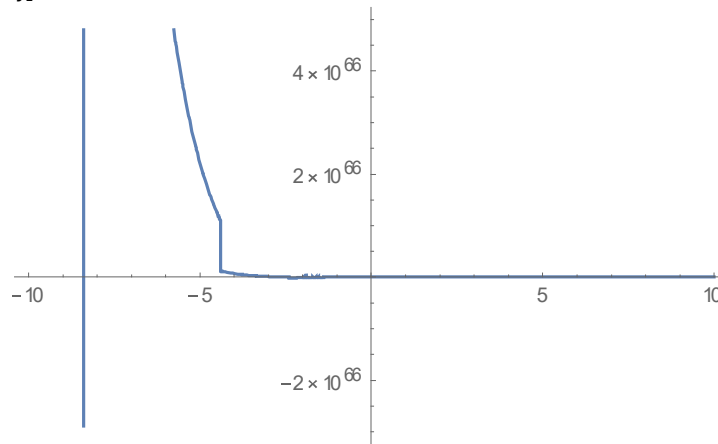


Figure 1. Plot of Ermakov-type solution for A=-10, B=-10

b. A > 0, B < 0

A=1;

B=-10;

ODE=x''[t]+A/x[t]^2-B/x[t]^3==0;

sol=NDSolve[{ODE,x[0]==1,x'[0]==1},x[t],{t,-10,10}]

Plot[x[t]/.sol,{t,-10,10}]

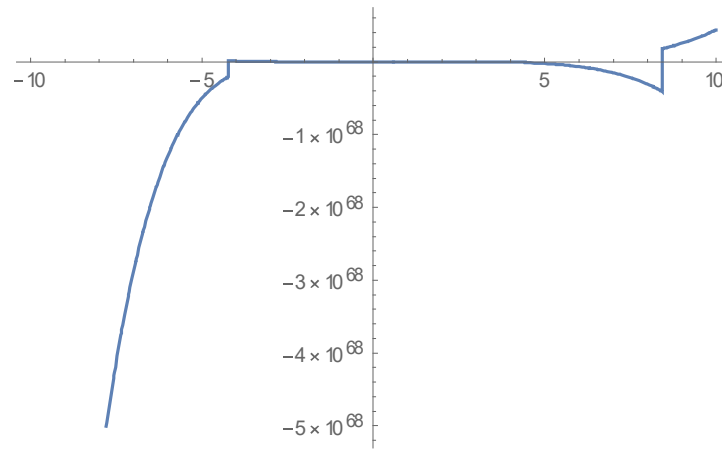


Figure 2. Plot of Ermakov-type solution for $A=1$, $B=-10$

From the above computational experiments, we conclude that the evolution of the Universe depends on the constants involved, especially on the rotational-vortex structure of the Universe. This needs to be investigated in more detailed for sure.

One conclusion that we may derive especially from Figure 2, is that our computational simulation suggests that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty and formless* (Gen. 1:2), to take its current shape with observed “accelerated expansion.”

As an implication, we may arrive at a precise model of flattening velocity of galaxies without having to invoke *ad-hoc* assumptions such as dark matter.

Therefore, it is perhaps noteworthy to discuss briefly a simple model of galaxies based on a postulate of turbulence vortices which govern the galaxy dynamics. The result of Vastitas’ model equation can yield prediction which is close to observation, as shown in the following diagram:[14]

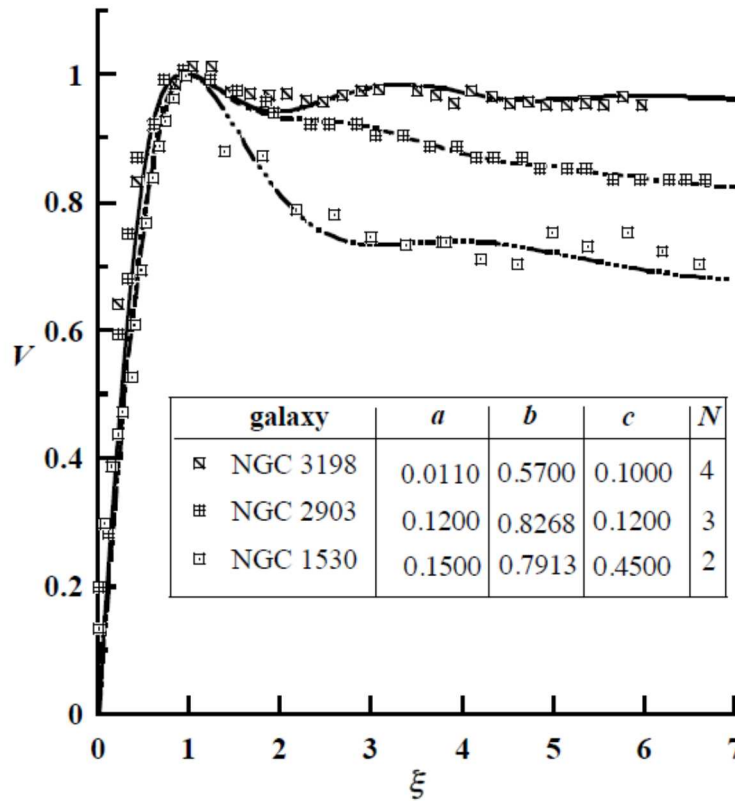


Figure 3. From Vatisas [14]

Therefore, it appears possible to model galaxies without invoking numerous *ad hoc* assumptions such as *dark matter*, once we accept the existence of turbulent interstellar medium. The Vatisas model is also governed by Navier-Stokes equations, see for instance [14].

b. How “turbulence-generated sound” can be put into a mathematical model for the early Universe

We are aware that the notion of turbulence-generated sound is not new term at all especially in aerodynamics, but the term is rarely used in cosmology until now. We will consider some papers where it can be shown that 3D Navier-Stokes will lead to non-linear acoustics models, which means that a turbulence/storm can generate sound wave.

In this section we consider only two approaches:

- Shugaev-Cherkasov-Solenaya’s model: They investigate acoustic radiation emitted by three-dimensional (3D) vortex rings in air on the basis of the unsteady Navier–Stokes equations. Power series expansions of the unknown functions with respect to the initial vorticity which is supposed to be small are used. In such a manner the system of the Navier–Stokes equations is reduced to a parabolic system with constant coefficients at high derivatives. [16]

- Rozanova-Pierrat's Kuznetsov equation: she analysed the existing derivation of the models of non-linear acoustics such as the Kuznetsov equation, the NPE equation and the KZK equation. The technique of introducing a corrector in the derivation ansatz allows to consider the solutions of these equations as approximations of the solution of the initial system (a compressible Navier-Stokes/Euler system). The direct derivation shows that the Kuznetsov equation is the first order approximation of the Navier-Stokes system, the KZK and NPE equations are the first order approximations of the Kuznetsov equation and the second order approximations of the Navier-Stokes system. [17]

4. Vortex-sound theory and fluidic Maxwell equations

There are a number of proposals to revise Maxwell equations. But few has considered a fresh starting point with regards to the (sub-)structure of aether. It is very interesting to note that Prof. T. Kambe from University of Tokyo has made a connection between the equation of vortex-sound theory and its analogue fluid Maxwell equations. He wrote that it would be no exaggeration to say that any vortex motion excites *acoustic* waves. [2]

He considers the equation of vortex sound of the form: [2]

$$\frac{1}{c^2} \partial_t^2 p - \nabla^2 p = \rho_0 \nabla \cdot L = \rho_0 \text{div}(\omega \times v) \quad (6)$$

He also wrote that dipolar emission by the vortex-body interaction is:[2]

$$p_F(x, t) = -\frac{P_0}{4\pi c} \ddot{\Pi}_i(t - \frac{x}{c}) \frac{x_c}{x^2} \quad (7)$$

Then he obtained an expression of fluid Maxwell equations as follows [2]:

$$\begin{aligned} \nabla \cdot H &= 0 \\ \nabla \cdot E &= q \\ \nabla \times E + \partial_t H &= 0 \\ a_0^2 \nabla \times H - \partial_t E &= J \end{aligned} \quad (8)$$

Where [2]:

a_0 denotes the sound speed, and

$$\begin{aligned} q &= -\partial_t(\nabla \cdot v) - \nabla h, \\ J &= \partial_t^2 v + \nabla \partial_t h + a_0^2 \nabla \times (\nabla \times v) \end{aligned} \quad (9)$$

In our opinion, this new expression of fluid Maxwell equations suggests that there is a deep connection between vortex sound and electromagnetic fields.

However, it should be noted that the above expressions based on fluid dynamics need to be verified with experiments. We should note also that in (8) and (9), the speed of sound a_0 is analogous of the speed of light in Maxwell equations, whereas in equation (6), the speed of sound is designated "c" (as analogous to the light speed in EM wave equation).

As an added note, we can mention here that elsewhere Wang [5] was able to derive Coulomb law from the source-sink approach. We are wondering if it is also possible to re-derive Maxwell equations including displacement current from the same approach. If yes, then it may offer another fresh starting point to understand the physical meaning of displacement current.

5. Conclusions

In recent years, there is growing number of proposals to use a novel concept of singularity-free Cosmology models. It should be clear that if we are able to come up with such singularity-free models which agree well with observation data, then the Big Bang model is no longer required. Therefore, here we explore a few alternative stories other than Big Bang story, which most cosmologists believe it is the nearest to Biblical account of creation (as Fred Hoyle once remarked: the Big Bang is a fanatical religion).

We argue that a re-reading of Genesis 1:2 will lead us to another viable story, albeit the alternative has not been developed rigorously as LCDM theories.

It took around three years before now we have been thinking this problem out loud, and here our answer can be summarized as follows: *“The relic sound wave in early creation is a faithful interpretation of John 1:1, but we can come up with a more complete picture if we combine it with Gen. 1:2, that is the Holy Spirit came to hovering over the primordial fluid, then a kind of hurricane/storm started which created perfect medium where God spoke (Logos).”*

And one conclusion that we may derive especially from Figure 2, is that our computational simulation suggests that it is possible to consider that the Universe has existed for long time in prolonged stagnation period, then suddenly it burst out from *empty and formless (Gen. 1:2)*, to take its current shape which is accelerating. Such a possibility has never been considered before in cosmology literatures.

We also briefly discuss a plausible extension of Maxwell equations based on vortex sound theory of Tsutomu Kambe. It is our hope that our exploration will lead to nonlinear cosmology theories which are better in terms of observations, and also more faithful to Biblical account of creation.

Acknowledgment: The first author would like to express his thanks to Dr. Joas Adiprasetya, Dr. Yonky Karman, and Dr. Wonsuk Ma for discussions on early creation of the Universe. We also thank to a number of professors in physics, including Prof. Liek Wilardjo and Prof. Thee Houw Liong. *May God be with you.*

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