CONTEMPLATIONS ON "THE GRAND DESIGN"
(OR, A DEBATE WITH STEPHEN HAWKING IN ABSENTIA)

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Abstract: The debate between the exponents of the hypothesis of evolution and Christianity over the origin of the Universe, of living organisms and of man is regularly being resumed. The fundamental worldview is of vital importance to men: without it they would be lost in the nonsensical host of various scientific theories, empirical data and philosophical speculations.

In the ideal case science is called to gain knowledge of nature while religion is called to resolve issues of the viewpoint of the world as well as morality questions. However, from the time of The Enlightenment up to the present day atheists have been attempting to use science for the purpose of justifying their secular views and of opposing such views to Christianity. In the present article we will endeavour to demonstrate how the naturalist approach is wrong and flawed from a logical point of view.

Key words: God, design, science, naturalism, Multiverse.

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PART THREE

EMPIRICAL VERIFICATION OF EVOLUTIONARY AND BIBLICAL COSMOLOGICAL MODELS – MACROCOSM

1. A Concise History of the Big Bang Hypothesis

In 1917, shortly after devising the General Theory of Relativity (GTR), Albert Einstein proposed a model of the Universe compatible with it. Following his own personal philosophical and overall scientific predilections, Einstein was convinced that the Universe could be represented only in terms of a static model, whose global properties do not change over time. In order to work out such a solution, he introduced into a cosmological constant Λ (lambda) the gravitational equation, with an added dimension of force, to compensate for gravity. Thus, he expostulated, the Universe would always preserve its equilibrium, remaining static, closed and finite.

In 1922, Alexander Friedman concluded that the Λ constant was incorrectly introduced and that following its exclusion, models built after GTR would be non-stationary – contracting or expanding. A few years later (in 1929), Edwin Hubble discovered the red shift in the spectra of remote galaxies, and on the basis of this observation drew the conclusion that they are scattering away from each other, that is, the Universe is expanding.

By the middle of the last century (1948), George Gamow suggested the idea of a "hot" Universe, which initially had a negligible radius, but tremendous density and temperature. The explosion later described as the Big Bang set in motion a process of the Universe increasing in size, which continues even to this day. Gamow and his associates' convincing calculations showed that with a continuous decrease in temperature from the initial extremely high temperature, the temperature of the residual background radiation by the current era would have reached levels of approximately 5K.

In 1964, Arno Penzias and Robert Wilson detected some unexplained radio noise, which they, following certain initial research to eliminate other possibilities, did not hesitate to interpret as the radiation predicted by Gamow. This residual radio emission is called "cosmic microwave background" (CMB). It registers within the range between 3 mm and 50 cm and has a temperature of 2.7K.

The standard cosmological model of the Big Bang outlines the evolution of a Universe which even its very birth was monotonous (homogeneous and isotropic). But even if in the past there were no fluctuations, with uniform distribution of matter the development of characteristic celestial structures of any type would have been impossible.

In November 1989, the National Aeronautics and *Space* Administration of the United States (NASA) launched the artificial satellite called the Cosmic Background Explorer (COBE). It was tasked to register not only the microwave background radiation (CMB), but also to search inside it for $\Delta T/T$ type fluctuations, where T represents the temperature of this radiation. The COBE satellite finally managed to register the long-sought fluctuations of the order of $\Delta T/T \approx 10^{-5}$. It is believed that these fluctuations confirm theoretical assumptions about the origin of the inhomogeneities, which in the Big Bang model explain the formation of large-scale structures in the Universe, such as clusters of galaxies and superclusters.

According to the General Theory of Relativity, if the average density of substance and energy (assuming they are uniformly distributed throughout the Universe) is greater than the critical, space becomes so warped that it closes in on itself. The paths of all heavenly bodies, from particles to galaxies, including even light rays, shift in a circular trajectory and remain within the boundaries of a Universe which has a positive space curvature (figure 1a). If density is less than the critical, the Universe bends in the reverse direction (as if its "surface" were distorted

outwardly), that is, it has a negative curvature (figure 1b). If the density is exactly equal to the critical, the equations according to the Theory of the Relativity would render a result for a flat space, that is, a space with no curvature (figure 1c). The first example deals with a *closed* Universe, the second with an *open* Universe, and the third with a *flat* one. [1] As early as the 1980s, physicists estimated that the average density of substance and energy was very close to the critical, and consequently presented no significant curvature, meaning that the Universe was essentially flat.

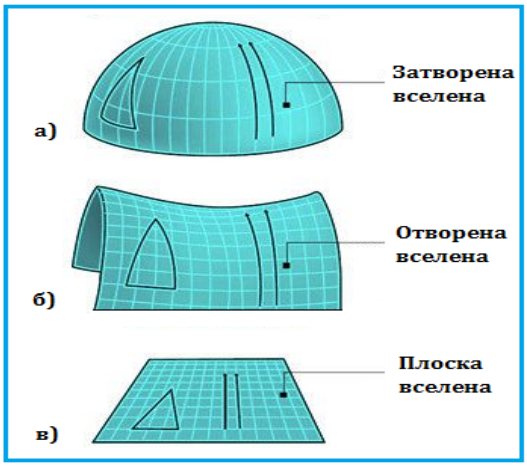


Figure 1: Two-dimensional analogues of Friedman's "three Universes":

a) Closed Universe with spherical surface. Parallel lines can converge, or intersect at some point. (Denisty > critical)

b) Open Universe with surface curved from the inside out, where parallel lines can diverge, or move apart from each other. (Density < critical)

c) Flat Universe for which Euclidean geometry is valid. That is, the distance between parallel lines remains unchanged. (Density = critical)

2. Contemporary explorations of the Universe

In a joint project between NASA and Princeton University, the WMAP satellite was launched into orbit in 2001 to measure the cosmic background radiation CMB with a precision and resolution 40 times greater than the preceding COBE satellite. As of early 2003, the measurements were analyzed and, thanks to the influx of highly reliable data, many cosmological models were proved inadequate and the field of cosmology was cleared from disproved assumptions. The only models remaining to contend were the *inflation model* (to be exact, some of its variants—see second segment of note [8] part 2) and the *cyclic model of Steinhardt-Turok* (but for a flat Universe – see note [1]). The latter predicts the accelerated expansion of space [2] which, with respect to inflation, looks like an inept addition. If, however,

the acceleration of galaxies is not confirmed, the inflation model still remains, but that would revive the mystery of the 68 percent insufficiency on the energy budget of the Universe (see figure 2).

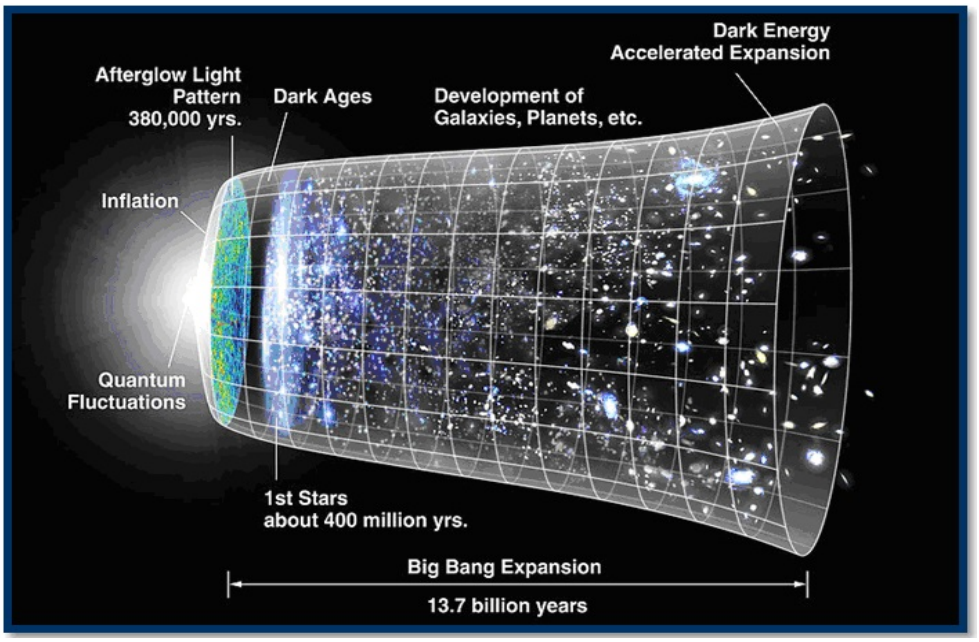


Figure 2: Evolution of the Universe. During the first 7–9 billion years, the speed of expansion slowed down, then gradually began to increase, from which physicists surmised the presence of dark energy. (The quantity of matter and energy observed in space, accounts for only 5 percent of the critical density of the Universe, therefore it is assumed that dark matter adds approximately 27 percent and the remaining 68 percent is accounted for by dark energy.)

In May 2009, the European Space Agency (ESA) launched into orbit the Herschel Space Observatory along with the Planck telescope, which was capable of image resolution ten times greater than WMAP. According to a number of expansion models, the gravitational waves generated by the Big Bang must have left their imprint on the polarization of the background radiation. Therefore, these satellites would not just register deviations in the levels of its temperature, but they will also measure the degree of its polarization (the average direction of the spins of microwave photons). Here the detection of primary gravitational waves would ensure the repudiation of cyclical approach and the confirmation of the evidential apparatus of inflationary models. [3]

And once again the Big Bang hypothesis was facing a complicated dilemma. If the inflationary model is reliable (that is, in the absence of accelerated expansion of space and primary gravitational waves), then the question remains for the 68 percent shortage on the energy budget of the Universe. If evidence fails to serve as proof for inflation theories, this would not only cause the cited issues with the cosmic horizon to re-emerge, namely the flat character of

space and magnetic monopolies, but would emphasize the importance to a number of others which were left unmentioned but which are by far extremely essential. Here are some of them: *the quantum origin of inhomogeneities, leading to the formation of stars and galaxies; the difference in temperature levels of the background radiation in different points of the space; the distribution of light elements (hydrogen, helium, deuterium and lithium); the lowest possible—but still not sufficiently low (!)—entropy at the starting point of the Universe* (see the calculations of R. Penrose in the following paragraphs). It should be noted that inflation could not be integrated into the models which attempted to merge quantum mechanics and General Theory of Relativity. In other words, if the inflationary hypothesis fails, the standard model og the Big Bang will have to dtep down as well. [4].

Despite the shortcomings of the theory displays in microcosm conditions, some of which were covered in the previous section, it does emphasize some fundamental problems inherent to the incredibly complex structure of the stars and stellar systems. Therefore, it should not come as a surprise that some critics have enbraced the view that, though it may answer certain secondary issues, the current hypothesis of the Big Bang is unable to answer the big question of the origin of the Universe.

Empirical data, which enable the testing of the cosmological models, refer to the period from the moment of the Big Bang until about 380 000 years later, that is, until the emergence of the cosmic microwave background. In what follows, however, we will try to include also the interval beginning 200–500 million years from the beginning of the Universe, when the first stars and protogalaxies were born, until approximately 3.3 billion years following the beginning of the Universe, when the formation of mature galaxies began (see table. 1).

Time following The Big Bang	Event	Years before our present time
0	Large explosion (The Big Bang) (singularity)	13,7 billion years
10^{-35} to 10^{-33} sec.	Inflationary era	
10^{-33} sec.	Quark - gluon plasma.	
10^{-5} sec.	Quarks compound into protons and neutrons.	
10^{-3} sec.	Synthesis of hydrogen and helium atoms.	
1 to 3 minutes.	Formation of light elements to boron.	
380 thousand years	The Universe becomes transparent. Cosmic microwave background (CMB) begins to be emitted.	

200-500 million years	Genesis of the first stars and proto-galaxies.	13,5-13,2 billion years
3,3 billion years	Formation of mature galaxies, quasars and the oldest stars of the Milky way.	10,4 billion years
8,1 billion years	Genesis of the solar system, Earth included.	5,6 billion years

Table 1

3. Dialectical materialism.

There is no unanimous agreement in opinion concerning the stages that galaxies might have possibly passed in the process of their formation. In the outset of the 20th century, the notable British astronomer J. Jeans proposed one of the earliest hypotheses in the field. His assumption was that at the beginning there existed space, uniformly filled with rarefied gas. Its gravitational contraction and rotation resulted in the formation of separate distant nebulae with regular spherical forms. Later, as their contraction continued and their rotation sped up, each nebula flattened into an elliptical disc. The gravitational field of neighboring nebulae caused matter from the disc to flow into space and, as it rotated, to furl into spiral arms. The result of these processes was the increase in density of the gaseous matter inside the branches, a process that might have made it possible for the initial formation of stars to begin, of all places, inside these nebulae. Edwin Hubble added that spiral galaxies which were formed in this way might self-destruct and eventually become irregular ones.

There is yet another view, exactly the opposite of the one just described. According to the hypothesis of Karl von Weizsaecker, the Universe initially existed as diffuse gaseous matter chaotically distributed in an extremely turbulent atmosphere. This means that gigantic vortices raged everywhere inside the primeval “fog”, and their influence brought about the first condensations, the first clouds of gas and dust of irregular shape. The clouds rotated around their axes, flattened and then turned into spiral galaxies. Stars began to form inside the spiral arms of these galaxies. Over time, these arms became stable elliptic systems.

All sorts of hypotheses have been devised, reflecting various possibilities for the formation of galaxies and their transformation from one type into another. Thorough analyses and calculations nevertheless clearly demonstrate that none of them should be considered especially convincing.

An overwhelming number of people firmly maintain the view that the Big Bang theory provides an excellent explanation for the genesis and arrangement of the Universe. It should be noted, however, that in the opinion of the Experts, this is hardly the case. Martin Harwitt admits

unambiguously that “The Universe we see when we look out to its furthest horizons contains a hundred billion galaxies. Each of these galaxies contains another hundred billion stars. That's 10^{22} stars all told. The silent embarrassment of modern astrophysics is that we do not know how even a single one of these stars managed to form.” [5]

James Trefil made no secret of his bitter feelings: "The problem of explaining the existence of galaxies has proved to be one of the thorniest in cosmology. By all rights, they just shouldn’t be there, yet there they sit. It’s hard to convey the depth of the frustration that this simple fact induces among scientists" [6]

In his book "The Universe in Time”, Paoli Maffei wrote describes a meeting between experts, organized by U. H. McCray and M. J. Rees from the British Royal Society, and held on February 14 and 15, 1979, for the purpose of discussing the origin and the initial phases in the evolution of galaxies. McCray, in his book “Universe in time”, in his turn returned to this event and reported that, with the discussion on progress, it became clear almost beyond any doubt that there was not a single person could claim in good faith they had received a better knowledge on the way galaxies had appeared from the opening session, and those in attendance of the concluding session didn’t do better.[7] To be exact, there is no record currently of anything that indicates some progress has been made in answering these remaining questions that could be considered as particularly convincing.

Critics note in this respect (apparently, not without some irony) that whenever a general scientific book on this topic is opened, and images of gaseous clouds and protostars barrage the reader, you will find the theories about the origin of the Universe and the stars stated in great boldness and confidence. However, whenever one attends a closed conference or symposium, one finds anxious people, desperate theories being refuted by solid scientific fact, lack of alternative explanations, an atmosphere of hopeless despair over unproven and unprovable ideas, and no solutions or scientific experiments that can alleviate the situation."

The notable Russian popularizer of science Anatoly Tomilin, even during the communist era, reluctantly declared that planetary cosmogony "has ended up in a state of an utmost crisis.” (It is clear from his book that he considers the same truth applies equally to stellar and galactic cosmogonies.) He adds: “Moreover, the crucial role in creating this situation was played by evidence recently obtained through observations. In itself, the underlying fundament of all extant hypotheses enters into contradiction with that evidence. And in order to bring science out of this critical situation, scientists will have to reexamine the underlying premise of the cosmogonic problems themselves in order to seek new ways to resolve them.”[8] One may wonder, however, whether this statement does not convey a most powerful acknowledgment of the fundamental impossibility to interpret the problems from a materialistic viewpoint?

Secular thinkers can often mislead their audience by overconfident assertions that, sooner or later, a naturalistic answer will be found to all inherent problems of science. But such an assertion is unfair because, objectively, there are two possibilities:

(1) Many of the contemporary issues and mysteries may actually be resolved in a more near or distant future.

(2) The extremely complex structure of the Universe cannot be accounted for by self-organized matter, and some external intelligent intervention is required for the construction of the Universe to make sense.

At this point we would like to answer the challenge posed by Stephen Hawking and Leonard Mlodinow in "The Grand Design". Since they maintain in their book that the Law of gravity is sufficient to organize our world, they would do well to demonstrate in what way the Solar System came into existence. Moreover, we want to give them the possibility to summon to their aid other natural elements as well – apart from gravity, they can invoke the electric and magnetic forces, the theory of turbulence, etc. But if they cannot satisfactorily explain the origin of even one small planetary system following the unhindered action of physical laws, how can they hope to convince us that the entire grand Universe followed the same course of action?

Moreover, the enormous violation of the impulse-momentum law, as observed between the planets and the Sun (and discussed in Part I), might be impossible to explain in terms of their favorite argument of "multiple Universes". Assuming that all the materials necessary to build a house were available, the workers still would have to apply additional momentum in the course of its construction. Here, the situation is no different: even if the Universe originated with its precise parameters from an infinite number of worlds, then the formation of our planetary system would still require an additional rational intervention.

The naturalistic view necessitates that celestial bodies and systems have emerged through series of chaotic collisions and their configurations were arranged on a random principle. In other words, one should expect that in the interval between 200-500 million and 3.3 billion years following the Big Bang, powerful gravitational waves would have been generated, since that interval would likely have experienced extremely frequent mergers of bodies into systems and collisions between protogalaxies, resulting the increasing growth and intense formation of large-scale structures (clusters, giant clouds of galaxies, etc.). Another question is whether it is plausible to trace back the origin of such a spectacular and complex hierarchical pattern of celestial formations – planets, stars, galaxies, etc., or its tremendous resilience over time for that matter (for example, it is estimated that the Milky Way would remain stable for approximately another 10^{16}, that is, hundred million billion years), to an event of random

occurrence. With the help of modern telescopes, we are currently (almost) able to retrace the process of emergence of the Universe in all its stages. Later, we shall share more about the most recent discoveries in this area.

4. Christian Theism

The account at the beginning of the Book of Genesis claims that ***God created matter out of nothing and that this creation of the Universe displays the unfolding of His grand design.*** We need to keep in mind that the creation of such a dynamic structure would be an extremely complicated task, since it can be organized in a different way at any particular moment, yet at the same time it always preserves its equilibrium. We should remember that even just the metagalaxy (the visible part of the Universe) contains around 10^{22} stars and more than 100 (and as some recent data show – over 500)[9] billion galaxies engaged in interaction that needs to be taken into consideration.

Attempting to design the Milky way, for example, with its over 400 billion stars (comprising, of course, a large number of stellar clusters, planetary systems, etc.), one will grasp immediately its extreme complexity. Each member of the galactic "family", if it be conceived as a perfectly solid body (i.e. one that is not subject to deformation), possesses freedom in various degrees, where it could move in three different directions and rotate around three mutually-perpendicular axes. In such a case, in order to determine the location of that one body in space, some numerical values should be assigned to the three spatial coordinates and the three rotational angles (simultaneously observing how fast these parameters change over time). However, to truly obtain an accurate solution of the movement of such bodies, it should be noted that no celestial body is absolutely solid. Changes in its shape, high and low tides, affect its orbital speed and the direction of the rotational axis, with various forces of mutual attraction acting as a result and orbits of other bodies being disturbed. Also, interactions with neighboring bodies through various forces of mutual attraction will not only disturb their trajectories, but will also result in deformation of the bodies themselves, such as those due to high and low tides, and in turn will further affect orbital speeds and the directions of rotational axes.

Additional details to be taken into account include electric and magnetic interactions, the rates of mass loss (e.g., stars continuously lose mass), the changes in the gravitational fields of other objects in the systems (and even for a system comprising three bodies, the coordinates already

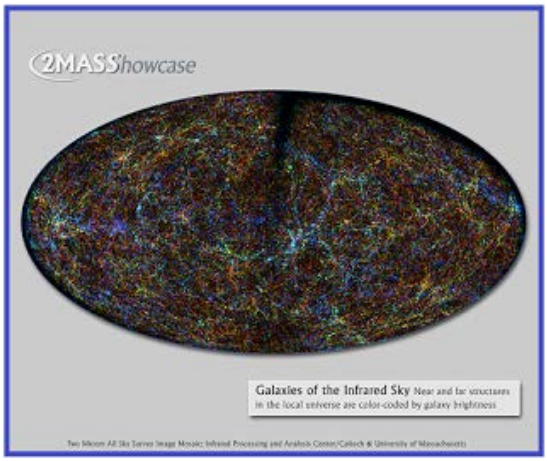
tend to be incalculable [10]),intermittent resonances (for instance, between satellites and planets inside the Solar system), the impact of interstellar matter (such as comets), heretofore unaccounted relativistic effects, as well as many other factors, which are not easy to enumerate. As we try to find a general solution to the problem of higher hierarchical formations that make up the Universe (clusters and super clusters of galaxies), there are yet still more challenges. Let us assume, for example, that each celestial system is comprised of a huge number, N, of ordered states consisting of bodies with different values of masses and orbital characteristics. (We assume that N represents a very large, but not infinite number, since the amount of substance and the sizes of the actual space systems are limited.) If two systems do not participate in an integral system as subsystems, their interaction would hence so influence the set of ordered states of the integral system, as to render it identical only to the section of the ordered conditions common to both subsystems. If there are three subsystems, the set of admissible states of the common system is once again to the situations where the three subsystems will enter into a state of equilibrium. Thus, the more subsystems, the smaller the set of their common ordered states. No wonder the likelihood is very small for the enormous number of celestial systems in the cosmos to be in harmony with one another in such a way that they could build up the overall dynamic structure of the Universe.

So far in these reflections we have not considered the changes that are also occurring inside each subsystem. If, for example, one system is comprised of two subsystems, its order would not be represented by the sum of the "mechanical addition" of the two stable states of its subsystems. (With hierarchical structures, the whole is bigger than the sum of its components.) The order in each subsystem is calculated as something qualitatively new, because external influences exerted by other subsystems must be taken into account. In this case, the new order in each subsystem is not identical to the subset of the set of its stable states (since it is only the influences between its own bodies that are explored here). Generally, as the number of subsystems grows bigger, some changes take place not only in the general order of the entire system, but in the order of each subsystem. This is because the subsystems are interdependent, and as they connect, they combine to create an integrated overall structure. But if it is necessary for the Universe to be designed as an integral entity, then the realization of the design requires that one adhere precisely to the specified design in every aspect at every level; otherwise, it is possible that this magnificent 'architectural temple "might collapse rather quickly.

At this point, it is impossible to tell what kind of structure the metagalaxy has, but one might assume it to be an integrated system. Since all objects in it would then be interconnected

gravitationally, they would be integrated in intricately-arranged hierarchical structures that would form the overall construction of the Universe (figure 3).

a)



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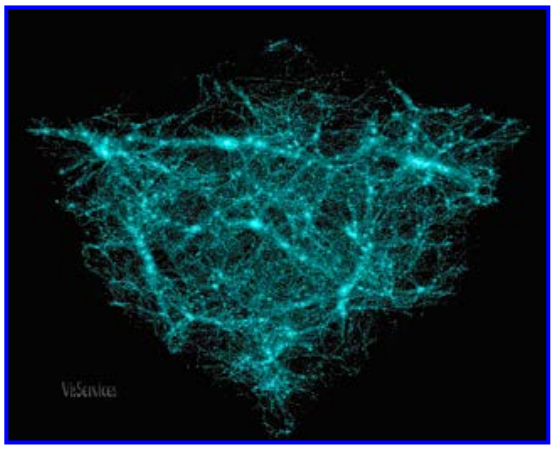

Fig.3 a): An image of more than a million bright corporeal objects was obtained during the completion of a program called the "All-Sky Survey". The investigators drew the conclusion that the arrangement of galaxies is not quite as chaotic as imagined, and that they are aligned in such a way as to form beautiful stellar systems. b) Part of an observable large-scale cosmic structure – clusters and super clusters of galaxies, which resemble something similar to a membrane of huge "cells", with such objects, however, entirely missing from the inner areas. [11]

The spectacular construction of the Universe prompted Paul Dirac, one of the greatest experts in mathematical physics, to exclaim: **"Perhaps, the best way to describe this situation is to say that God is a mathematician of the highest order and may have used some rather sophisticated mathematics as he built the Universe. Our finite mathematical achievements give us an idea about a tiny part of the Universe and the more mathematics evolves, the more we can hope to begin to have a better understanding of the Universe"** [12]

(*Of course, God does not need to make calculations – He is in command of complete knowledge, the ultimate wisdom and omnipotence, and consequently He calls a perfect Universe into being without any intellectual and creative effort*!)

But as demonstrated by observations, the order in these systems is continuously being disturbed – stars explode, galaxies collide, etc. These changes produce dramatic alterations in the interaction between members in the system, which will ultimately lead to their demise. These conclusions are in remarkable agreement with the biblical view on this matter. There it notes that the Universe in the beginning was "firmly established, it cannot be moved "(Ps. 96:10, NIV), but in consequence of man's sin, all creation was subjected to the "bondage of corruption", that is, destruction (Romans 8: 20, 21).

In the previous section, it was mentioned that in terms of materialism, natural processes run from chaos to order, and theism defines exactly the opposite tendency – from order to chaos (which is in full agreement with the second law of thermodynamics – the law of increasing entropy).

Roger Penrose, in his book *The Emperor's New Mind*, wrote that in order to create the Universe in a state of low initial entropy, "the Creator must aim for a [considerably tiny] volume of phase space." His calculations led him to the conclusion that "the aim of the Creator" must have been accurate to 1 to 10 to the power 10^{123}, which is 1 followed by 10^{123} zeros – a number that we "cannot write down in full in the ordinary denary notation, "because even if we were to write a zero for each [elementary particle] in the Universe, we should fall far short of writing down the figure needed". [13]

In the nineteen seventies, as B. Collins and S. Hawking considered the initial conditions for the beginning of the Universe they demonstrated through proper mathematical analysis that "**... a Universe that is not absolutely correct is unstable. In other words, a Universe that was chaotic at the moment of its emergence subsequently would become increasingly chaotic.**"[14] What follows is the "domino effect" – chaos increases over time, meaning that disorder and disorganization intensify until the order in the entire system is completely destroyed.

Applying the respective mathematical methods and devices, and utilizing appropriate computer simulation, we can verify if the effect of this principle continues also into the later stages of the formation of the structures of the Universe – planetary, stellar, galactic, etc.

If one drew a probability curve to represent the distribution over time of stability within celestial systems (which originated on a random basis), it would be possible to measure its validity in regard to the enormous number of observable galaxies (over 500 billion), thus allowing the statistical predictions to be tested with utmost precision. For example, it is reasonable to expect that a given percentage of the galaxies would fail to reach sustainable

dynamic equilibrium and for this reason, it should be possible for a significant number of them to be detected in the state of collapse. Another problem is the ability of galaxies to increase in size, as a result of successive collisions, and rearrange themselves into newer resilient configurations.

(We are able now to reassert that the cosmos is extremely well-balanced and organized – the frequency of colliding stars and galaxies in it is insignificant – making it rather implausible that it should have been organized on a random basis! Moreover, contrary to Hawking and Mlodinow, we believe that the ***law of gravity*** is absolutely insufficient to provide structure to the Universe – its purpose being simply to maintain the balance inside it.)

4. What observational data can tell us?

The image entitled **"Hubble Extreme Deep Field"** (fig. 4) shows over 5,500 galaxies. The remotest are approximately 13.2 billion light years away, which is confirmed by their spectral lines obtained via ground-based telescopes. Indeed, some of them are small and have strange and fascinating shapes, and on the picture one can see also the mysterious quasars, but the overwhelming number of them are objects almost completely identical to the galaxies as we know them in our present time.

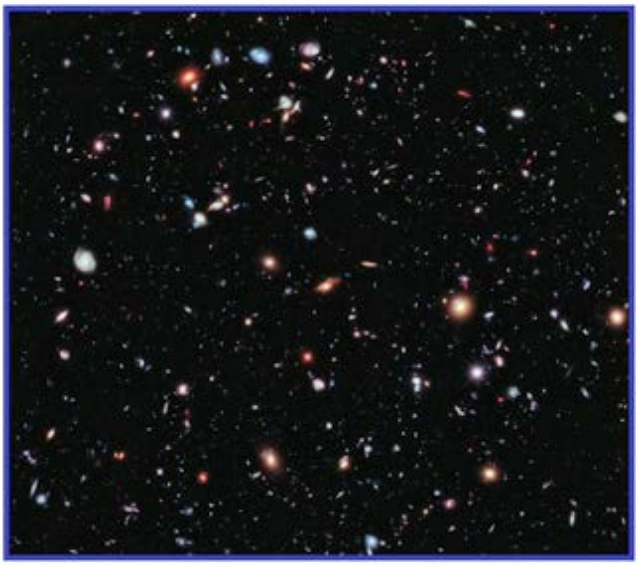

*Figure 4: The **Hubble Ultra-Deep Field** (**HUDF**) displays a series of photographic images of the Universe, covering areas of the ultra-deep cosmos, taken by the **space telescope Hubble** at an exposure rate of over a million seconds.*

In commentaries made on images of this kind [15], one fact is given prominence, namely, the size of some of the galaxies in the image represent barely 1 percent of the size of the Milky Way,

while others are so blue as to be apparently extremely poor in heavy elements. Some cosmologists believe that such objects represent a key moment in unveiling the mystery of the first evolutionary stages in the formation of the Universe.

Richard Bauwens, from the University of California, stated: "These galaxies are without a parallel so far. They are rather blue, and apparently lack completely any heavy elements; in other words, they belong to a generation with almost primary characteristics." The article goes on to add: "In-depth observations have provided some new evidence for the hierarchical model of the process of gradual shaping of galaxies, where small objects gain mass, or merge into larger ones in a steady and systematic, but dramatic, sequence of collisions and agglomeration" [16]

Arguments of this kind, however, are not sufficiently compelling.

As early as 2005, astronomers from the Carnegie Observatories in Pasadena, California, and the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, discovered that, at the time when the age of the Universe did not exceed 2–3 billion years, it contained a rather diverse array of galaxies. By their own account, it was filled not just with young and active galaxies, but also with galaxies already dead, which, in turn, suggested that these galaxies must have formed at a stage much earlier than was recently conjectured. [17]

A few years later, three scientists from Yale University in Princeton, New Jersey, USA, and from the University of Leiden in the Netherlands, observed a galaxy named 1255-0, at a distance of 10,7 billion light years, that was four times more massive than the Milky Way, but six times smaller in size. The discovery shows that ever since the dawn of time, there have been huge galaxies for which there was no need to increase in size, devouring in a "cannibalistic" way their own kind. Astrophysicist Karl Glazebrook predicted that hundreds of galaxies resembling 1255-0 will be discovered in the coming years and said: "It is almost like realizing that the population of Ancient Rome was the same as that of present day London, suburbs included".[18]

It was recently reported that an international team of astronomers traced the emergence of galactic clusters during the younger years of the Universe and reached the conclusion that **they had not emerged gradually, but rather as the result of an explosive and practically simultaneous birth of most galaxies** (thus it turns out that sizes of galaxies seem not to increase by some "dramatic process of collision and agglomeration"). Researchers monitored more than 200 "embryos" of such clusters in the first three billion years following the Big Bang, with the aid of the "Planck" and "Herschel" telescopes, as well as from several ground-based observatories. Young galaxies in these clusters formed stars at tremendous speed – the annual aggregate mass of luminaries in them was several hundred or even thousands or times the mass

of the sun. It is assumed that protoclusters "dissolve[d]" at a later stage and become transformed into hundreds and thousands of individual galaxies. [19]

In addition, the amount of supernovae in the Universe is rather insignificant and insufficient to support the claim that the elements following iron have dispersed precisely as a result of supernova explosions. Apparently, it is for that reason that data reports often do not make mention of the fact that the majority of primeval galaxies were not as poor in heavier chemical elements as reported, that is, only data consistent with the theory have been given prominence (a practice that, unfortunately, appears all too common).

It seems possible to follow not just the process of emergence of some of the earliest galaxies (whose existence dates back to 200-300 million years after the emergence of the earliest luminaries), but also the ongoing processes throughout this entire period of 2-3 billion years, when "mature" galaxies were beginning to form (see Table. 1). In this case, collisions between stars within the galaxies, as well as between galaxies themselves, must have been a rather common phenomenon. This raises the question, "why are observed collision frequencies much lower than should be expected?" [20]

6. Biblical cosmological model.

The narrative in the book of Genesis declares that the creation of the earth and celestial bodies occurred on the first and fourth days of the 7 days of creation:

> *"At the beginning God created **the heavens** and **the earth**. Now the earth was formless and empty; darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said: let there be **light**. And there was light. God saw that light was good, and he separated the light from the darkness. God called the light "day", and the darkness he called "night". And there was evening, and there was morning - the first day.*
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> .....
>
> *And God said: Let there be lights in the expanse of the sky (to lighten the earth) to separate the day from the night, and let them serve as signs to mark seasons and days and years; and let them be lights in the expanse of the sky to give light on the earth. And it was so. God made two great lights; **the greater light** to govern the day, and **the lesser light** to govern the night. He also made **the stars**; God set them in the expanse of the sky, to give light on the earth, to govern the day and the night, and to separate light from darkness. And God saw that it was good. And there was evening, and there was morning - the fourth day." (Genesis 1:1-5, 14-19; NIV)*

In terms of Christian theology, **God created the worlds *ex nihilo*, i.e. out of nothing**. Nearly all biblical commentators understand "heaven" from the first verse as the invisible world where the throne of God is established, surrounded by angels, cherubim, seraphim, etc. A more

detailed representation of this transcendental world is found in the Books of Isaiah, Ezekiel, Revelation and others, and they are available for everyone who might want to look into them in greater detail. The opinions regarding how we should understand the word "earth" are basically divided into two main strains – the Old Earth Model and the Young Earth Model. We shall attempt to describe them briefly here:

A) Some accept that apart from the planet Earth, the word "earth" may denote the totality of physical matter in Space, for example in the form of gas-dust clouds (and it can be assumed that it also relates to dark matter and dark energy). In this case, at the command of God, celestial bodies must have formed at a later stage out of this primeval matter and started to orbit and to group into planetary, stellar and galactic systems.

B) Others understand the word "earth" to refer exclusively to our planet, and that the sun, moon and stars appeared on the fourth day. Therefore, the Universe has emerged suddenly and in a state of complete order.

7. Empirical conclusions

1.) Within the Biblical model, the term "Big Bang" may denote the instant creation "*ex nihilo*" of the space-time-matter continuum, but unlike the standard scenario, the process did not begin in one definite point.

The attempt to unite mathematically the theory of general relativity and quantum mechanics has demonstrated in a compelling way that the Universe could not have started from a point of zero size and infinite density, which raises the question of what the dimensions of its original volume might have been.

NASA and ESA plan to launch into orbit the most advanced detector of gravitational waves to date – LISA (Laser Interferometry Space Antenna). [21] As some scientists have put it, "it will be able to record the fingerprints of God, left all over the tissue of the cosmos in the earliest moments of creation, to help us understand the specific way in which the Universe has emerged". Indeed, LISA will work with such precision as to be able to capture the shock waves from the first trillionth of a second following the Big Bang. (As a point of reference, cosmic background radiation measured by WMAP dates back from a point some 380 000 years after the beginning, a point at which, it is believed, atoms begun to form.)

2) According to the Biblical model, the formation of stars took place only once, at the dawn of time. If this is the case, we would be able to observe their inception only in the earliest of galaxies, or, in other words, we will discover that the Universe emerged in the initial moment fully arranged.

Data from most recent astronomical observations, referred to in the previous section, corroborate in much more compelling way alternative A) (that is, the "earth" from the first verse of Genesis should be construed to describe all physical matter in space).

In 2018, NASA, ESA and the Canadian Space Agency (CSA) will join efforts to position the "James Webb" space telescope in a heliocentric orbit, with a mission to search for light from some of the first-formed stars and galaxies. In a similar mission planned by NASA for 2020, the WFIRST infrared telescope will be able to detect thousands of the remotest galaxies (and therefore measure some of their earliest events), covering a segment of the sky 100 times that of Hubble. [22] Aided by these powerful devices, humanity can explore the possibility of masses and orbital characteristics of celestial objects being carefully pre-ordained and their configuration established from the outset. To put it differently, in the words of Stephen Hawking, we will be able to find out if indeed "**God has unfolded his masterplans to set the Universe in motion**"!

(In an earlier article from September 2012, used as a prototype for this one, it was stated that the only possible moment for stars to have formed was during those initial eras of development of the Universe. [23] This article was published two and a half years before data was measured that started to prompt researchers to examine this possibility – see note [19]. Of course, God could activate some physical mechanism to enable stars to "reproduce" or "reduplicate" in the manner living organisms do, and to continue this process into our current era as well, but we believe this option to be less likely. Using the James Webb and WFIRST telescopes, we will be able to verify whether the protostar stage still unfolds according to classical theory of stellar evolution, or whether it "self-accumulates" in an unusual way, as if "by God's command"!)

3) According to classical theory, celestial bodies did not form only in the initial ages of the Universe, but continue to form even today. If this is the case, then the number of stars found at a certain phase of their development should be proportional to the amount of time they spend in each phase. The protostar stage is about one hundred times shorter than the time stars spend on the main sequence. This would indicate that observed protostars should be about 100 times fewer than normal stars. In the Milky Way, and in over thirty other galaxies of the Local Group, there is very good visibility not only of the nuclei and the structural peculiarities, but also of individual stars, clusters, nebulae, etc. The total number of stars in them has been determined to be between 2000 and 3000 billion. Their larger number provides a very good basis for drawing statistical conclusions regarding how many have passed through the different stages of their development. Basic calculations show that at least several tens of billions of protostars should be detected inside the Local Group. **So far, proponents of the classical theory of stellar evolution have been unable to provide a satisfactory explanation for their absence. [24]** (Let us remember that if protostars existed, the key stages of their development would have been traceable even

in the last decades of the twentieth century. Satellite-based telescopes from that time were able to explore the cosmos in all sectors of the electromagnetic spectrum. And what shall we say about their modern successors which are many times more powerful than them?)

"*The deafening silence*" of the ground detectors of gravitational waves testifies to the exact same point! Six of the current gravitational wave detectors function in a synchronized way where their collective sensitivity enables them to register signals, coming from a distance up to 100 million light years, i.e., within the boundaries of the local supercluster (fig. 5), whose range includes tens of thousands of galaxies. It is estimated that in the course of one year in every typical galaxy (that is, one that comprises about one hundred billion stars) an average of one star is formed with the mass of the Sun. According to modern theories, the process wherein stars gather into larger formations is brought about gravitational fragmentation of the substance in the gaseous and dust nebulae. It can be expected that, due to the unbalanced forces of mutual attraction, there will be frequent mergers of this kind. These would occur either between stars already at more advanced stages of their process of emergence, or between stars already "hatched"—thereby also generating gravitational waves—at a rate of at least 20–30 per year. (This number was considerably reduced in favor of evolutionists—in reality, the number should be many times greater.) For the nearly nine years of faultless operation of the detectors, however, not a single such event was reported. [25]

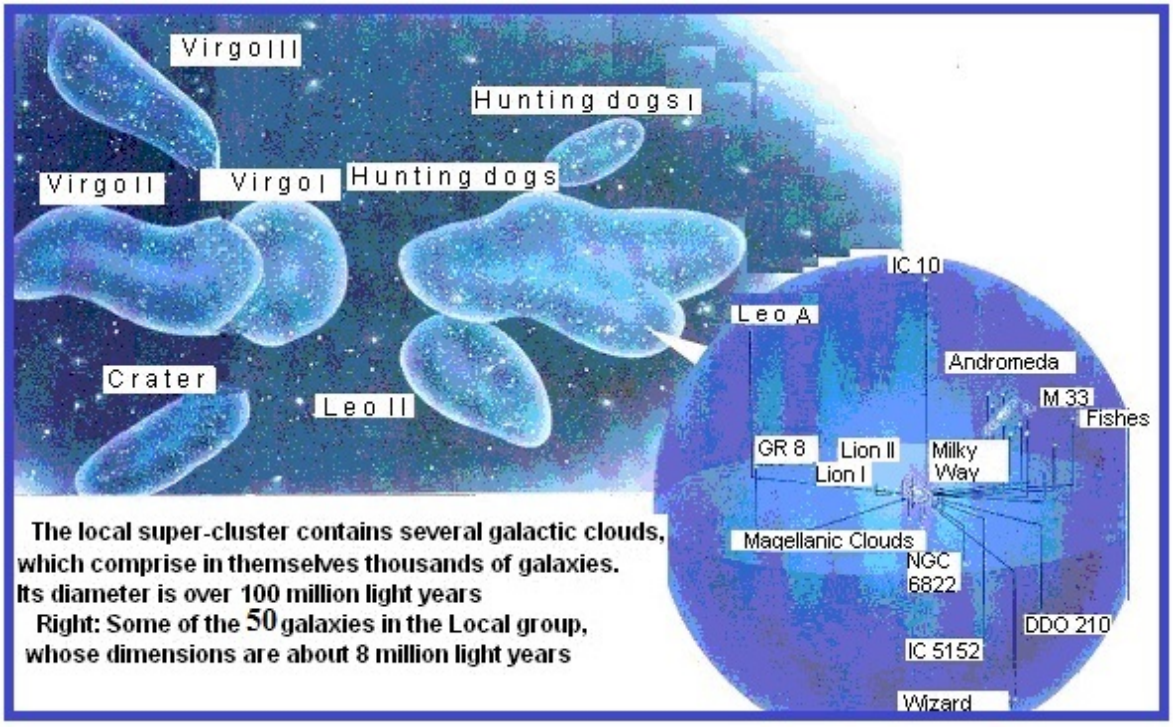

Figure 5: The Local Supercluster and the Local Group of galaxies.

One of the tasks of the Herschel Telescope was to explore the cosmos in the infrared and submillimeter range, where it could see through the intervening dust which previously obstructed the Hubble Space Telescope. Thus it was able to look into the gas-dust clouds, from which the stars are presumed to have originated, in order to examine the "conditions in the womb". Its mission was terminated in 2013, but following a nearly four-year period of almost continuous operation, it failed to capture even a single image where it could be proved that protostars are present (and as in other cases, this result appeared to be under-reported so as not to cause doubt in the classical theory of stellar evolution).

4) Let us assume for a moment that the cosmic microwave background is a residue of the "light" that shone upon the heavenly expanse on the first day of Creation. If this is the case, we need to clarify once again which of the two biblical scenarios is more likely to have been realized in fact.

According to the first scenario, the Earth and the gas-dust clouds appeared before the cosmic background radiation, and in the second – all physical matter came after it, in the form of finished stellar systems. Also, the characteristics of gravitational waves and of the fluctuations (and even perhaps polarization) of cosmic background radiation would be different if stellar bodies and space structures were gradually formed in the Universe over time, as opposed to emerging instantaneously with the Universe at its beginning.

5) Let us suppose that supermassive black holes [26], located in the centers of large galaxies (at least 1% than the size of a typical galaxy), as well as " dark matter"[27] have emerged somehow "ad hoc" (on demand) to ensure sustainable dynamic equilibrium in stellar and galactic systems, and thereby to structure the Universe in a wonderful way. Let us examine the implications of such a supposition.

The first stars in galaxies began to form around 300 million years following the Big Bang, and quasars came into being some 700 million years later. Quasars are extremely bright galactic nuclei and are believed to have resulted from the accelerated accumulation of gas onto supermassive black holes (with mass greater than millions and billions times that of the Sun).

According to astronomers, it is a mystery as to how these huge cosmic "monsters" have emerged and their sizes increased over such an amazingly short period of time. On the other hand, supermassive black holes can act as a central body that gravitationally retains the other components of the system.

Modern studies have demonstrated that dark matter tends to form a sphere (called a dark matter halo) around a galaxy, with a radius almost ten times that of the galaxy itself. Scientists believe that, in this way, the dark matter ensures the stationary mode of celestial systems, and they are impressed that the equilibrium inside them has been attained on such a scale.

Moreover, in the opinion of a number of astrophysicists, according to the big bang theory, the original matter would have been too hot for it to spontaneously begin forming stellar structures. Dark matter, in one of its supposed forms, may have acted as a kind of "glue" which made the entire process possible.

It is also assumed that the “web” that holds together the gigantic cosmic structures (see Fig. 2b), is the result of the invisible support of dark matter.

If scientists find in themselves the courage to reconsider the aforementioned phenomena, perhaps they would finally recognize that God has demonstrated very clearly and in front of our eyes how he built this majestic architectural ensemble called the Universe. The eminent British philosopher Antony Flew, considered a pioneer of modern atheism and who was one of its proponents over the last 50 years, recently changed his stance radically. It is reported that, when asked what might happen if his newly adopted views were repudiated by the scientific community, he replied: "That would be quite regrettable. My whole life has been governed by the principle ... (of) following evidence wherever it might lead me."[28] A similar principle can redeem us not only from our own biases (which very often tend to be quite deceptive), but also from the mandatory materialist paradigm, which activates the ideology of political correctness in the scientific realm.

(In the following section we shall discuss the possibility of God having called the Universe into existence within a very short space of time or even within an instant, but due to the limited speed of light, we are still able to witness the unfolding of its actual materialization from the beginning until the present moment.)

From data cited here, it appears that not just the "standard big bang theory" (with its requisite inflationary theory), but also the hypotheses requiring a "cyclic" or "stationary" Universe (see notes [4] and [20]), have proved to be unreliable. For this reason, we continue to wonder at the self-confidence of Hawking and Mlodinow in claiming that naturalistic theories successfully explain the emergence of the world "without the need for God"?

(As for biology, problems related to the understanding that random events are able to set in motion the evolutionary processes and lead to spontaneous self-generation of life and its evolution, have been known for many years. As early as 1966, Murray Eden, a mathematics professor from MIT, said in a report to the Wister Institute in Philadelphia the following “"We maintain that if the term “accident” be subjected to a serious and critical interpretation in terms of probability theory, the postulate of accident becomes extremely improbable and, for the Theory of Evolution to be scientifically adequate, it would have to wait until some new natural laws are invented and perfected – physical, physic-chemical and biological")[29]

The best experts on probability theory have made similar statements, and for that reason we wonder if the time has come for militant atheists to listen more closely to the voice of science, as they have appealed to everyone else to do?

It is abundantly clear that, if it is not based on random processes, self-organization in the living world is no longer Darwinian evolution and has nothing in common with naturalism.

It was reported recently that, in the course of the experiments with the Large Hadron Collider, some new particles have been discovered, and perhaps even a fifth fundamental force of nature.[30] We are eagerly waiting for the authors of "The Grand Design", or their followers for that matter, to invent some "new natural laws" and produce their next scientific masterpiece in praise of "omnipotent nature.")

Conclusion

After the failure of hundreds (and already even thousands) hypotheses on the formation of the Solar system, the stars and the galaxies, it is reasonable to think that the dialectical-materialistic approach is unacceptable as an explanation for the origin of the Universe. The Christian church of today is facing the challenge, assisted by a team of expert cosmologists, astronomers, physicists, mathematicians, theologians, etc., to develop a model for creation that can be examined empirically at a micro- and macrocosmic scale. (We should remember, however, that "God's ways are inscrutable", that is, there are doors open to surprises!) The realization of the most important experiments with CERN's Large Hadron collider is imminent, as well as the crucial satellite projects – LISA and the James Webb space telescope, WFIRST and others, which will help us determine whether the scales tip towards naturalism or towards theism. [31]

Moreover, Prof. R. Dawkins appealed to the entire scientific community to find a solution to the problem of the "presence or absence of a creative Supermind" (see the first paragraph of point 3, section 2). Since it is his own idea, we would kindly invite Prof. Dawkins to initiate a research program with the aim to discover the answer to this important problem, the same problem that has occupied the minds of some of the greatest thinkers, scientists and philosophers for many centuries.

We believe that science is the best ally of Christianity, since it provides the most objective model for studying the structure of the Universe, and for determining its origin. We fully believe that, after all is said and done, scientific revelations will affirm the truth about the creation of the world by an intelligent God-Creator.

NOTES

[1] If the Universe is a **closed system**, its expansion will gradually slow to a stop. Then it will begin to condense, or shrink, at an accelerating speed, until it finally collapses to its initial point. Next, a period of a new explosion, expansion and collapse will follow, and so on. Such a cycle would take about one hundred billion years. This kind of Universe is called cyclic (oscillating, pulsating)

(At the beginning of the 21st century, Paul Steinhardt and Neil Turok, within the frames of string theory, developed a radical incarnation of cyclic cosmology, this time with a flat Universe. They contend that our Universe is a three-brane Universe, which collides with another parallel three-brane Universe once every several trillions of years. The explosion of the collision gives the beginning of every new cosmological cycle).

In the case where the Universe is ***open*** or ***flat***, it would continue to expand indefinitely. Galaxies would increasingly move apart from one another, and over a period of about ten million billion years each one would disintegrate. The heavenly luminaries would go out, that is, at the end of their course they would become white dwarfs, neutron stars and black holes. Finally, after nearly 10^{116} years, all substance would turn into radiation and neutrinos.)

[2] In 1998, two groups of astronomers, one led by Saul Perlmutter from the Lawrence Berkeley National Laboratory, and the other by Brian Schmidt from the Australian National University, announced a thrilling discovery. While observing supernovae of type Ia, located in galaxies standing at various distances from the Earth, the two teams came to a very surprising conclusion: the expansion rate of the Universe not only does not slow down (as theory foresees), but on the contrary – it is *accelerating*.

[3] In June 2014, astrophysicists of the BICEP-2 team reported that they detected weak gravitational waves in the polarization of the CMB radiation. Later, however, the team of the Planck space mission expressed doubts that those "folds" in the polarization of the relic radiation were actually caused by the impact of gravitational waves. Eventually, it turned out that the reported phenomenon was accounted for by space dust.

Physicists deny the existence of gravitational waves

http://goo.gl/7OT1qq

[4] The "Planck" telescope provides a much clearer image of the relic radiation than that of the COBE and WFIRST devices. One of the detected anomalies was the presence of an over-all"curvature" - unevenness in the distribution of fluctuations in the microwave background. Leaving aside the exotic hypothesis of collision with another Universe, these quite significant inhomogeneities in the CMB cosmic microwave background radiation are not only able to discredit the entire concept of inflation, but also completely remove it from the stage.

„The Heritage of the Planck Telescope"

http://goo.gl/PgnzwD

Professors R. Penrose and V. Gurzadyan also believe that the new images of the CMB refute the inflationary theory. In their opinion, the Universe goes through cycles of existence, dominated by big bangs and collisions between supermassive black holes.

„The Image of the Pre-Bang Universe Captured"

http://mystics.eu/astronomia-kosmos/283-zasneha-vselenata-predi-golemia-kosmos.html

The model of a cyclical (oscillating) Universe assumes that at certain intervals it contracts to a definite point and then explodes again. However, measurements of space demonstrated in a convincing way that the Universe is flat (that is, it would expand forever), and not closed – cyclical. The Penrose - Goyrzadyan Hypothesis could be brought into harmony with the model of Staynhart -Turok about a flat and at the same time cyclic Universe, but it is based on string theory (see note[1]) whose problems were already discussed in the previous part of this article.

[5] Martin Harwit, *Book Reviews*, Science, March 1986, pp. 1201-1202.

[6] James Trefil, *The Dark Side of the Universe*, 1988, p. 55.

[7] Maffei, P. *The Universe Within Time,*

[8] Tomilin, A., *Fun Cosmogony*, Narodna Mladej, Sofia, 1979, p. 110

[9] **"500 Billion – A Universe of Galaxies: Some Older than Milky Way"**

http://www.dailygalaxy.com/my_weblog/2013/06/500-billion-a-Universe-of-galaxies-some-older-than-milky-way.html

[10] Leaving aside other details, we will describe briefly the impossibility of the case with regard to gravitation. To that end, we will make use of a quotation from an astronomy textbook: "The most illustrious problem in celestial mechanics is the three-body problem that has been (and continues to be) an object of attention on the part of the great mathematicians and astronomers. It consists in the following: for a certain initial moment, the coordinates and velocities of three bodies with known masses are given. Determine the positions and velocities of bodies for any arbitrary moment.

The problem has an analogous formulation for N bodies.

Actually, it is not bodies that are being examined, but material points. Nevertheless, it suffices to imagine that each material point is acted upon by the gravitational field of other points, which undergoes complex changes over time, which is able to induce narrow approximations, in order to make it clear that the solution, describing the unimagined variety of the consequences of these approximations, would appear in an extremely complicated form.

It can be shown that, in the problem for N bodies, only 10 integrals are known. Since for three bodies we have 18 differential equations of the first order, and only 10 integral constants are determinable, then the problem seems insolvable. ...

The general three-body problem was analytically solved in 1912 by the Finnish scientist Sundman, who showed that it is possible to show the development of the coordinates of the three bodies, the distances between them and the time "t" in sequences by the degrees of the auxiliary variable, which are absolutely convergent. In 1931-1933, the French scientist Beloritzki determined that in order to measure the positions of the larger planets with the accuracy of the astronomic annuals, only those sums that contain no less than $10^{8\,000\,000}$ terms should be used from Sundman's sequences. (This figure baffles imagination – author's comment V.V.) It could be reckoned that an analytical solution to the problem of the three bodies has been found, but its significance is theoretical and by no means practical."

(Nikolov, N., M.Kalinkov. *Astronomy*, publisher "Sveti Kliment Ohridski", Sofia, 1998, p. 76, 77.)

[11] **"YURIY GAGARIN PUBLIC ASTRONOMY OBSERVATORY, Stara Zagora"**

http://astronomy4all.com/content/структура-на-вселената-стр8

http://astronomy4all.com/univerce-structure?page=7

[12] P.A.M. Dirac, "The Evolution of the Physicist's Picture of Nature," in *Scientific American,* May 1963, p. 53.

[13] Penrose, R., *The Emperor's New Mind*, published by Sv. Kl. Ohridski, Sofia, 1998, p. 415.

[14] Maffei, P. *The Universe Within Time*, Science and Art State Publishing House, Sofia 1989, p. 321

[15] **"Hubble Extreme Deep Field"**

http://goo.gl/rSAbwC

Another (slightly earlier) image called "Hubble's ultra-deep field" shows more than ten thousand galaxies at the age of about 13 billion years:

Hubble Ultra-Deep Field

https://bg.wikipedia.org/wiki/Hubble_Ultra_Deep_Field

Recently it was reported that a galaxy 13.4 billion years old was discovered, and as a result Garth Ilanguort, from the University of California, felt understandably astonished: "It is amazing that such a massive galaxy has already been in existence within 200-300 millions of years following the formation of the first stars".

Scientists "penetrated" almost to the end of the Universe:

http://it.dir.bg/news/nasa-galaktika-habal-spitzar-gnz11-golemiat-vzriv-nachaloto-vselenata-miliardi-svetlinni-godini-mladata-vselena-orbitalen-teleskop-21923130

[16] “Hubble Reaches the "Undiscovered Country" of Primeval Galaxies”
http://hubblesite.org/newscenter/archive/releases/2010/02/full/
[17] **"Early Universe was a zoo"**
http://www.astronomy.com/news/2005/03/early-Universe-was-a-zoo
[18] **"HYPERACTIVE GALAXIES IN THE YOUNG UNIVERSE"**
http://www.gemini.edu/node/11303
[19] "Herschel and Planck Find Missing Clue to Galaxy Cluster Formation"
http://goo.gl/FvkPR3
[20] Perhaps in this situation the idea may occur to many scientists to resurrect the so called stationary model of H. Bondi, T. Gold and F. Hoyle first presented as far back as 1948. It introduces a special "S - field", which generates substance, such that the average density is not changed as a result of the expansion of the space. Some proponents of that view suggested the possibility that the world has always existed (without being created) in the well-ordered state in which we see today. Tests conducted with remote objects (clusters, radiogalaxies) however did not concur with this hypothesis, and it failed to find the answer to the question about the origin of the CMB, as well as to a number of other objections.
(In 1993, F. Hoyle, J. Burbage and G. Narlikar devised another version of this model called quasi-stationary state cosmology (QSS), which also postulates an "eternal Universe." It was able to explain the presence of relic radiation, its current temperature, the amount of lighter nuclei, etc., but thorough analysis proved that their findings were speculative.)
[21] The LISA experiment consists of a group of three satellitesplaced in orbit around the sun at a distance of about 45 million kilometers from the orbit of the Earth. They will form an equilateral triangle with a side of 5 million kilometers, and they use lasers to be in continuous communication with one another.
http://nauka.offnews.bg/news/Kosmologiia_13/Uspeshen-test-za-evropejskiia-kosmicheski-detektor-na-gravitatcionni-v_38755.html
[23] *"The Cosmological Model of Creation narrated in the Bible",*
http://goo.gl/T0c031
[24] All astronomers agree (including atheists), that there are only several dozen (maximum – hundreds) objects which show signs of protostars. But they are all disputable since similar phenomena are observed with regard to the stars on the Main sequence. One could add that this is an insignificant quantity (the Local group alone should comprise several dozens of billions of stars); it becomes clear that the stellar evolution theory has been a complete failure. Here is what Dr. Jason Lisle wrote in his article "Celestial stars confirm the Biblical story of the Creation": "Therefore, many creationist scientists are convinced that stars cannot form

spontaneously under normal conditions. And despite claims to the contrary, we've never seen a star forming.[5]

[5] Sometimes astronomers refer to "star-forming regions" very matter-of-factly. The layman might assume that astronomers are actually seeing stars' form in such regions, but this is not so. Such regions contain hot blue stars; which astronomers assume have formed from a collapsing cloud in the recent past.
http://www.scienceandapologetics.org/text/414.htm

[25] The only type of gravitational waves known until recently were indirectly measured by Russell Hulse and Joseph Taylor in the process of observing an unstable double system of neutron stars (and not of protostars), located at about 16,000 light years from us. Their orbits slowly fall apart due to the loss of energy radiated in the form of gravitational waves, which in time will inevitably lead to their collision.

On February 11, 2016, scientists officially confirmed the presence of gravitational waves, which they had detected at the Gravitational Observatory LIGO back in September of the previous year. Their source for these waves was two black holes rotating around each other, respectively 29 and 36 times more massive than the Sun, located 1.3 billion light years from the Earth.

"Exclusive! Scientists have discovered gravitational waves!"
http://www.cosmos.1.bg/portal/2014-10-24-20-54-26/1206-2016-gravitational-waves-detected

Thus the question remains: where are the gravitational waves that were originated by the fusion of protostars? Within neighboring clouds that contain thousands of galaxies (fig. 5), the process of protostar formation should be continuing, and such fusions should have occurred at distances much closer than 1.3 billion light years and between bodies with masses tens of times that of the sun. In such a situation, gravitational waves should be much easier to detect!

[26] It is well accepted that quasars might represent the active nuclei of galaxies. It is assumed that at the center of almost any galaxy, a supermassive black hole might exist, absorbing matter from surrounding space. Unabsorbed matter may rotate at a great speed on the threshold of the event horizon and may incandesce with internal friction up to millions of degrees Kelvin. Luminosity of quasars sometimes surpasses that of hundreds of billions of suns, but according to some observations, the earliest among them have emerged as late as 700-900 million years after the big bang.

„Discovery made of the brightest quasar with the most massive black hole"
http://nauka.offnews.bg/news/Novini_1/Otkriti-sa-naj-iarkiia-kvazar-s-naj-masivnata-cherna-dupka_4424.html

[27] So called "dark matter" cannot be directly observed by modern methods, but has been indirectly detected because of its gravitational interaction with already familiar matter.
Renowned astrophysicist Fritz Zwicky, in 1933, was the first to conjecture that large-scale structures should contain some hidden mass. By measuring the speeds of galaxies situated in the periphery of the "Coma" cluster, he reached the conclusion that the gravitation of the cluster was too low to deter them from dispersing into space. Indeed, the calculations he made indicated that the cluster contained 400 times more mass than expected.

Later, in 1960, astronomer Dr. Vera Ruben determined that the rotational figures of galaxies (which set the circling speed of the stars inside them, depending on their distance to the center) also suggested the existence of additional mass derived from some invisible matter.

Nowadays, hardly anyone questions the existence of dark matter.

[28] Richard N. Ostling. Famous Atheist Now Believes in God. Associated Press Newswires, December 9, 2004.

[29] Murray Eden. Inadequacies of Neo-Darwinian Evolution as a Scientific Theory, p. 109.

[30] **A particle more mysterious than the Higgs boson was detected inside the Large Hadron Collider**
http://www.blitz.bg/news/article/398488

[31] Apprehensive lest the situation with Galileo be repeated, the Orthodox Church does not venture to propose its own models of Creation. But let us remember that the Ptolemaic geocentric model, challenged by, has been borrowed from ancient (Babylonian, Greek, etc.) scientific thought, since it offered at that time the most accurate method of astronomical prediction of the location of celestial bodies. The Ptolemaic system was adopted by Christianity owing to its significance for the calendar, but it is not founded on any distinctly-formulated biblical principle of Earth centricity; neither was it validated with a conciliar resolution by the Church. The stance taken by the Orthodox Church, in an attempt to dissociate itself from the issues posed by science to modern society, presents the potentially serious danger for our faith and culture to become local, incapsulated and insulated, and hence for our missionary activity to be minimized.
As we have stated repeatedly, the biblical text does not allow *apriori* understanding of how God created the world, and expounds only the framework (which, to be frank, is essentially creationism; this is something that all Orthodox Church Fathers agree upon - *consensus patrum*). The original way in which matter was called into existence *ex nihilo* remains secret, but with

the help of modern scientific techniques, we can follow "as on a film" how the Universe has unfolded.

Since we do not have at our disposal a conciliar resolution of the Orthodox Church, all Christians (or body of theologians, scientists, etc.) should feel free to formulate their private opinion (*teologumen*) on the issue of creation (and not just this issue), subject to biblical and scientific verification. Otherwise, achievements in any field of science will continue to be refracted solely through the lens of materialism and atheism!

„Open Letter of His Holiness the Patriarch of Moscow and All Russia Cyril"

http://goo.gl/tFg5Tq