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Big Bang Theory: Science or Religion

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In 2016 *Stephen Hawking* a British theoretical physicist met Pope Francis and participated in a conference in Rome on the Big Bang theory, held to commemorate *Fr. Georges Lemaître*, the inventor of the idea which reconciled science with religion.

"The Big Bang theory, which is proposed today as the origin of the world, does not contradict the intervention of a divine creator but depends on it": *Pope Francis* [1].

Hawking stated that "Big Bang" theory is one of the most important intellectual discoveries, but he denied divine assistance claiming that the universe arose according to the laws of physics. Bing Bang theory [2] states that the Universe came into being 13.799 ± 0.021 billion years ago in a moment from a point containing all the substance of universe, smaller than the period at the end of this sentence. Neutron is the heaviest known particle, at 1.6749×10^{-27} kg, and 8×10^{-16} m radius. One mm^3 neutron mass coincides with a mass of about an 80 m high hill ($\sim7.8\times10^5$ t). This is the theoretical, but actually unreachable limit of any known mass to be compressed in 1 mm^3. In nature osmium is the densest measured element, at 22.61 g/cm^3, and synthetic hassium has the highest density at 40.7 g/cm^3. The hypothesis of the eruption of universe from a point in a moment is nonsense. Naming the absurd density, a "Singularity" or "Planck epoch" cannot change it pseudoscience nature, so Pope Francis was right stating that the theory needs divine assistance. In this article I'd like to highlight some of the discrepancies of Big Bang theory.

To solve the mystery of existence is one of the most coveted knowledge of mankind since ancient history. Almost every culture has its own theory of creation, mostly by naming Gods as the Creators of the world [3]. Missing the necessary information, the prominent scientists kept themselves away from creationism: *"Hypotheses non fingo": Isaac Newton* [4].

Observation that led to Big Bang Theory

In 1912 *Vesto Slipher* measured the first Doppler shift [5] of a distant "spiral nebula" and defined 41 galaxy 'Doppler shifts' by 1921. Slipher examined photographically the brightness of stars and their signal to noise relation (S/N) interpreting it as frequency shift caused by galaxies moving away. Slipher obtained as high as 1800 km/s receding speed.

In 1922 *Alexander Alexandrovich Friedmann*, a Russian mathematician and physicist introduced the idea of the expanding universe on the base of general relativity [6].

In 1927 a Belgian priest and astronomer *Georges Lemaître* published a theory, inspired by general relativity, of the expansion of universe from a "Cosmic egg" or "Primeval atom" containing all the mass. Big Bang theory was later developed from this idea.

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In 1929 *Edwin Hubble* concluded that galaxies are drifting apart supporting Lemaitre's idea. Hubble determined the rate of expansion too, known as Hubble constant: H_0=500 km/s/Mpc, where 1 Megaparsec (Mpc)=0.26 million light-years. The constant [7] was revalued many times, this year (2018) so far three times (in February, April and July). The last value in July:

H_0=67.66 ± 0.42 (km/s)/Mpc

Hubble's law

Objects observed in deep space are found to have a "redshift", interpreted as a relative velocity away from Earth;

This "Doppler shift" measured velocity of various galaxies receding from the Earth is approximately proportional to their distance from the Earth.

The parameters in Hubble's law are not directly measured, but the brightness of galaxies provides information about their distances, relative velocities and their ages. Hubble correlated brightness and frequency change for large distances: $z=\Delta p/p=\Delta\lambda/\lambda=\Delta f/f$; where p=power of brightness; λ=wavelength; f=frequency.

In Big Bang theory space expands with proportional velocity, so the time of this expansion can be calculated by distance and velocity:

$v=H_0D$; where v=the receding velocity of an object (space), D=Distance in Mpc unit.

$v=\Delta D/\Delta t$; where v=speed of expansion, $DH=ctH=c/H_0$ where DH=Hubble distance; tH=Hubble time=$1/H_0$

The age of Universe=1/H0 ≈ 3.09×10^{19} km/(67.66 km/s × 3.157 x 10^7s) ≈ 14.4×10^9 year.

By the April value (73.52km/s) we would get 13.3 billion years so the universe became a billion year older just in 3 months, which questions the credibility of the statement of theoretical physicists that only the first 10^{-11} second of Big-Bang is uncertain.

The 'official' age is 13.799 ± 0.021 billion year, corresponding to H_0=71(km/s)/Mpc.

There are more methods to calculate Hubble parameters, for simplicity I used the above ones because they relate closely to Hubble's law.

In Big-Bang theory Hubble sphere (rHS) gives the distance light travels from Big Bang to present day, where the receding speed=c.

$rHS=c/H_0$=4431 Mpc=14.4 × 109 ly (light-year) if H_0=67.66 (km/s)/Mpc

Shortcomings of Big Bang theory

Hubble's law is similar to analyzing a photo made at night, where only the lights of cars can be seen, and we try to estimate the speeds and distances of the cars and the time-span they are on the road. The theory doesn't take into account, that not only a 'Single point, one moment creation' can expand the universe, or produce background radiation, but 'Permanent widespread genesis' as well. Permanent widespread genesis, where matter and electromagnetic waves come into being and decaying or transforming continuously all over the universe, suits more to a homogenous dynamic and stabile system like the Universe, while the 'One point one minute' eruption of the world results rather an asymmetric, unstable and decaying system.

Ambiguous deductions: Brightness as a power of light is influenced by more factors beyond its frequency. There are masses in outer space blocking, or diffracting light or modifying its speed. The farther the source is; these factors can weaken the brightness of it more without relative movement.

Hydra constellation is nearing Milky-way at 600 km/s, Andromeda galaxy is approaching with 130 km/s, and the distance between our galaxy and the Great Attractor decreases with 1000 km/s [8]. M86 galaxy around 52 million light years away is moving towards our Milky Way at 419 km/s contradicting the expansion of Universe.

The approaching of nearer galaxies determined by traditional methods suggests that maybe the calculations based on Hubble law is responsible for the expansion of universe in larger scale. The constant which is used to estimate the expansion was reduced from 1800 km/s to 67.6 km/s since its invention, and is an object of discussions nowadays. Reaching 0 km/s would mean the end of the theory.

Brightness paradox of Icaru: Icarus (MACS J1149 + 2223) is claimed to be the farthest star to be seen with its 9 billion light-year distance [9], however it is brighter than other stars much closer to us, contradicting Hubble's law. The phenomenon is explained, by the supposed magnifying power of a galaxy (MACS J1149 + 2223) 5 billion years away. It is supposed that huge masses can magnify the brightness of stars behind them by deflecting and focusing the light beams similar to lenses. However, masses in outer space rather block the light, so light-beams travelling through galaxies are probably more dispersed and weakened than focused. The total brightness of stars will be decreased by the shadows of objects. The cause of the unexpected emergence of Icarus is probably the movement of a mass which blocked its light earlier.

Speed and location anomalies of Big-Bang: GN-z11 is the farthest galaxy which is determined by Hubble's law:

"GN-z11 is a high-redshift galaxy found in the constellation Ursa Major. GN-z11 is currently the oldest and most distant known galaxy in the observable universe. GN-z11 has a spectroscopic redshift of z=11.09, which corresponds to a proper distance of approximately 32 billion light-years (9.8 billion parsecs). GN-z11 is observed as it existed 13.4 billion years ago, just 400 million years after the Big Bang; as a result, GN-z11's distance is inappropriately reported as 13.4 billion light years, its light travel distance measurement [10].

At first glance, the distance of 32 billion light-years (9.8 billion parsecs) might seem impossibly far away in a Universe that is only 13.8 billion (short scale) years old, where a light

year is the distance light travels in a year, and where nothing can travel faster than the speed of light. However, because of the expansion of the universe, the distance of 13.4 billion light years traveled by light from GN-z11 to Earth, called the light-travel distance, has expanded to a distance of 32 billion light-years during the 13.4 billion years it took the light to reach us [10] (Figure 1).

The position of GN-z11 we can observe now is claimed to be 13.4 billion years old, which means that Big-Bang had to take place somewhere around it, maximum 400 million light-year away, because no force is known to accelerate any mass to the speed of light. With the known parameters of GN-z11 we can estimate the minimum speed of Earth (vE) receding from Big-Bang. For that the Earth and GN-z11 should travel from Big Bang in opposite directions on the shortest way coinciding with the path of light (Figure 2):

13.8vE+0.4vG=13.4c; where vE=receding speed of Earth, vG=receding speed of GN-z11

vE+vG=32c/13.8=2.3c → vG=2,3c–vE

Minimum receding speed of Earth: 13,4vE=12,48c → vE=0.93c

The speed of GN-z11: vG=c(2.3-0.93)=1.37c

This case the speed of GN-z11 must be higher than the speed of light contradicting both traditional and relativistic physics. If the distance between 2 object increases with a speed of 2.3c then at least one of them must travel faster than light. Space determines the positions of objects; it cannot expand independently from them. The distance from GN-z11 and the age of the galaxy locate Earth at the brink of Universe, which should cause asymmetry in the number of observable galaxies and stars.

Moreover, there are about 20 other galaxies [11] over 13 billion years old, which may claim their own Big-Bangs within 800 million light years from them.

If Big Bang took place somewhere near to the Earth, these galaxies should receding from us with a speed over 16c.

According to measurements of space radiation it appears that Earth travels with 368 ± 2 km/s relative to the Cosmic Microwave Background (CMB) which is held to be originated from Big Bang. Because the speed of electromagnetic waves is constant in space, the relative movement to CMB determines the actual speed in space, so the receding speed of Earth from Big Bang cannot be higher than that.

The relative speed of Earth to CMB negates Einstein's Special relativity theory built on the equality of inertia systems and constant relative speed to electromagnetic waves (EMW).

Paradoxes of CMBR as remnants of Big Bang

In 1926 Arthur Stanley Eddington estimated the temperature of Universe caused by the radiation of stars, at 3.18 K. Despite of the fact, that his calculation was based only on the observable lights of stars, his result was quite near to the now accepted value of 2.72 K.

In 1948 Alpher and Gamow predicted the CMBR on the

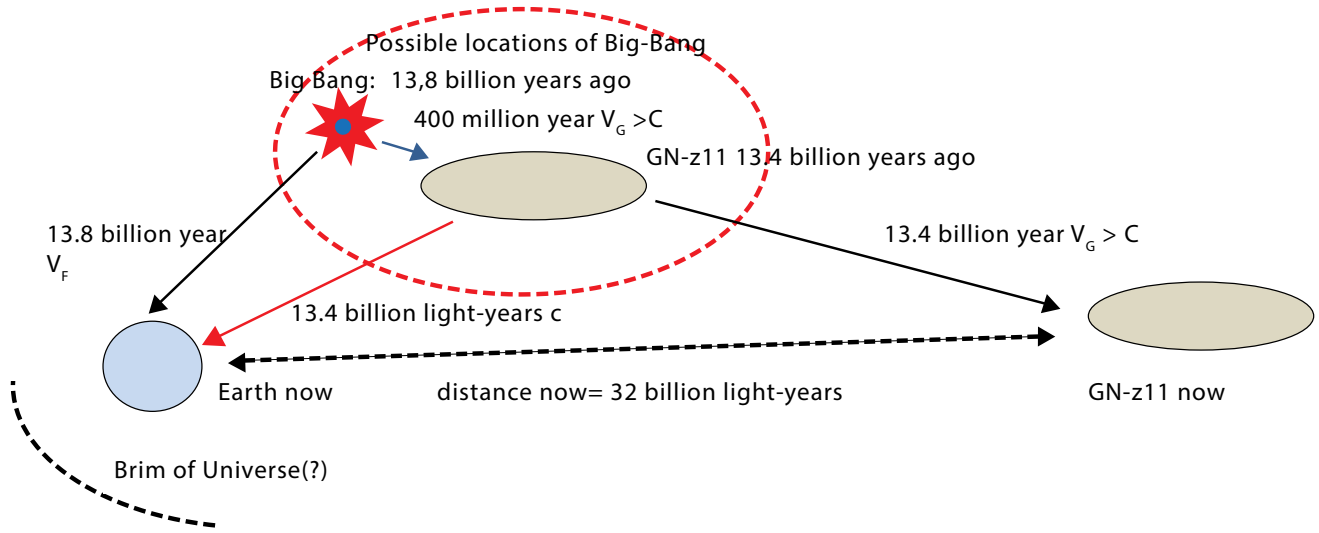

Figure 1: The possible relative movement of earth and the galaxy to Big Bang.

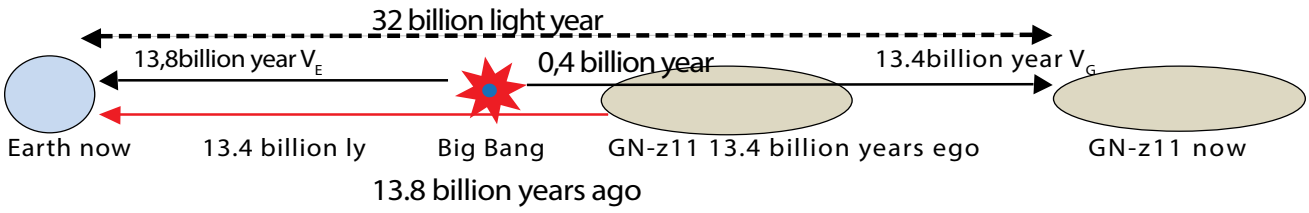

Figure 2: The earth and GN-z11 from Big Bang in opposite directions on the shortest way coinciding with the path of light.

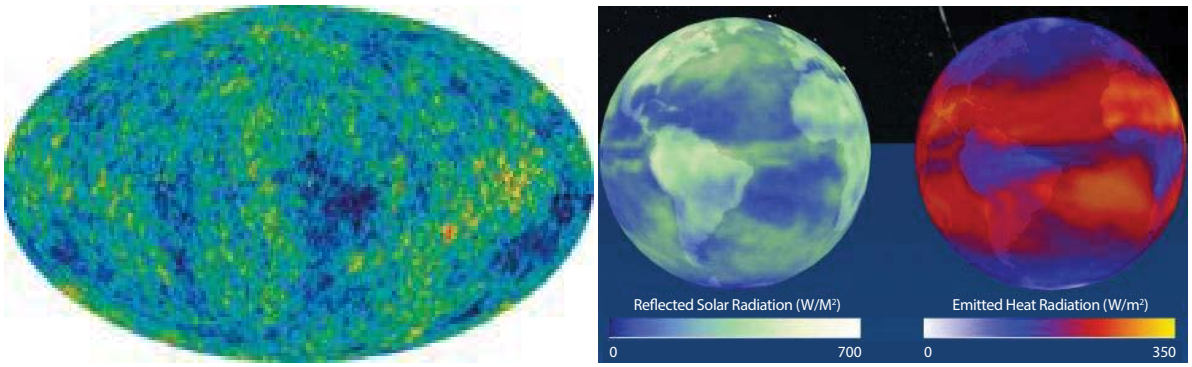

Figure 3: CMB image and reflected solar radiation and emitted heat (microwave) radiation of earth.

base of Big-Bang theory. Alpher and Robert Hermann later estimated the CMB temperature to be 5 K, then 28 K, Gamow first estimated a temperature of 50 K in 1952, then in 1956 of 6 K.

The main difference between Eddington's and Gamov's estimation is that Eddington referred to the stars as the sources of radiation, while Gamov's held Big Bang as the original source. CMBR coming from all direction was discovered in 1964 by American radio astronomers Arno Penzias and Robert Wilson [12]. (The spectral radiance of CMBR peaks at 160.23 GHz). According to the Big Bang model, the radiation comes from a spherical surface called the last scattering 380,000 years after the Big Bang, when the universe was a "foggy" plasma where free electrons became bound to protons to form hydrogen atoms. The red-shift "z" of expansion is claimed to reach 1100. The temperature (Tr) of the universe at that time is estimated by the present temperature: Tr=2.7 K (1+z) ≈ 3000 K. Needed explanations: How could have 'z' reached 1100, meaning that the receding speed of the plasma was 100 times that of GN-z11 galaxy, and what force slowed it down to the lower receding speeds of observable galaxies. How could the plasma cool from 10^{32} K to 3000 K just in 380000 years, when cooling from 3000 K to 2.7 K needed more than 13 billion years.

Because the size of the "foggy plasma" with its maximum 380000 ly radius could have been as large as a bigger galaxy, the electromagnetic waves radiating from it should have escaped, or absorbed by masses came into existence at the time. Because CMBR comes from all direction, and only existing objects emit low level microwave black-body radiation, depending on their temperature, the galaxies and other matters filling the universe must be the real sources of this kind of radiation.

A radiation originated from a central Big Bang should have little chance to reach Earth, if not directly radiated to it which case the location of Big Bang could be identified.

CMB image states to show the 13.77 billion-year old temperature fluctuations that correspond to the seeds of the galaxies. However the picture of the CMB of present universe must show the actual sources of radiations, not the 13.77 billion year old phase of Big Bang (Figure 3). (We cannot claim that a photo taken of a chicken shows the egg it was hatched from).

This image from NASA [13] demonstrates the reflected solar radiation and emitted heat (microwave) radiation of Earth. According to physics all the matter in universe emit, or reflect radiations. Only by extracting these kinds of radiations could we claim to see the mystical Big Bang radiation, provided we were outside of Hubble sphere, to have time to catch it. But that case Earth should have been created in another Big Bang.

The temperature of Universe is claimed to be cooling since Big Bang from 10^{32} K (Planck temperature –absolute hot=1.42×10^{32} K) to the present day 2.7 K.

The core temperature of Earth is 5,700K, the core of Sun is 15.7 million K its surface temperature is 5,778 K, The hottest known star is WR-102 with its 210,000K surface temperature and 9,800 light year distance. Lynx Arc is a distant super cluster of extremely hot stars 12 billion light-years away, with a temperature of 80,000 K [14]. The hot remnants of Big Bang billions of light-years away aren't detected, temperature seems to be diverse and rhapsodic.

To decide between theories, experiments are needed

"Where knowledge ends, religion begins."-Benjamin Disraeli [15]. The "Cosmic egg" or "World egg" from which the universe came into being was a mythological motif in many ancient cultures, from the Chinese myth of Pangu, to Finnish Kalevala [16]. Big Bang theory joins science and Christianity to these kind of myths, till physicists cannot prove with rational methods and experiments the contrary.

The ambiguous interpretation of phenomena like the brightness of stars or background radiation leads only to contradictions. The universe seems to be a homogenous dynamic system of decaying and renascent elements suggesting widespread permanent genesis. Stars are producing tremendous energy filling the space and are consisted of primordial elements, so maybe they are the cues of creation. The interaction between matter and electromagnetic waves should be examined more profoundly too reach any conclusion regarding the cause of their existence.

"If you want to find the secrets of the universe, think in terms of energy, frequency and vibration"-Nikola Tesla. The biggest problem is however, that Big Bang theory

oppresses other more rational ideas by one-sided interpretations or by hiding facts supporting alternative solutions.

Since the early 20th century there weren't any essential experiment in physics performed to test alternative ideas contradicting to theories built on relativity, while theoretical physics produce only ambiguous hypotheses for a hundred year now.

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