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Chemistry, Physics sans Mathematics of Super Atom: A 'Self' Appraisal of post- Big Bang Universe

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ABSTRACT

We are merely on a Planet which is in the Universe but not the Universe itself. The Universe is a circle of trust for us since its carbon age of 13.5 billions of years. Make believe kinetic galaxies are ruling the Universe dashing and colliding into one another as per the scientific observations. This Paper does not jump to haste of arguments with regard to evolution of the Knowledge all along these 13.5 billion years on the time scale to testify to the fact that knowledge transformed and became undependable in between the generation gaps of men and women as explorers for 'human beings' also subject to radical transformations to give out knowledge of scientific value exclusively to interpret their own origin besides that of their home Planet as well as the Galaxies and the Universe as their originator, generator and destroyer.

This Research Paper has no Mathematics to deploy intentionally to highlight as the one and only one leading the minds as made out to be for the last few Centuries since truly speaking, it was not Mathematics to take credit in the self appraisal of the super atom's big bang Universe till the last. On the other hand, the mains are led by Chemistry & Physics sans Mathematics when it comes to the Super Atom accountable for the transparency of the standardized Knowledge worthy of authority to live a human life of 100 years on an average in the post-Big Bang Universe.

Key Words: *post-big bang, Super atom, Universe, Chemistry, Physics, Mathematics.*

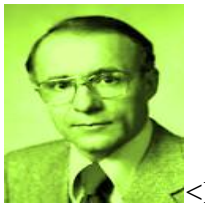
Introduction

Proof of Big Bang Theory @ Nobel Prize Awardees

Big Bang meant the substantial explosion with an output of robust radiation that marked the birth of the Universe! This is not a joke. This is the confirmed scientific theory devoid of fishiness with facts based on true research findings for which the globally popular Nobel Prize has been awarded to the two eminent Scientists, H.E. Robert Wilson & H.E. Arno Penzias in the year 1978 for their proof on the live clue to the absolute point of beginning of the Universe and making it transparently threadbare and indelible.

Fig. Big bang signature

One should note the extraordinary marvel that the robust radiation-glow-light called *Cosmic Background Radiation (CBR)* or *cosmic microwave background radiation (CMB)* is still intact and reverberating since the very first moments of the Big Bang said to have taken place from now back to 13.7 billion years in the past confirmed aided by the 2oth Century's scientific, engineering and electronic paraphernalia deployed for the purpose for data analysis and information management techniques successfully on footing the bill of huge costs of human resources and project management time-lines.



<R.W.Wilson> <Arno

Allan Penzias> 

Figs above: American physicists, Radio Astronomers & Nobel laureates in physics and co-discoverers of the CBR/CMB which helped establish the Big Bang theory of cosmology

Salient Features of CBR / CMB

1. It was unlike anything coming from anywhere else in the Universe.
2. It was extraordinarily uniform.
3. It was not a localized radiating lump but microwave radiation present throughout Universe.
4. It did not have a definite source
5. It was distributed equally everywhere in the Universe.
6. It has tiny variations in temperature
7. It disclosed how matter began to form stars and galaxies.
8. It proved to Observers how "clumpy" the Universe is.

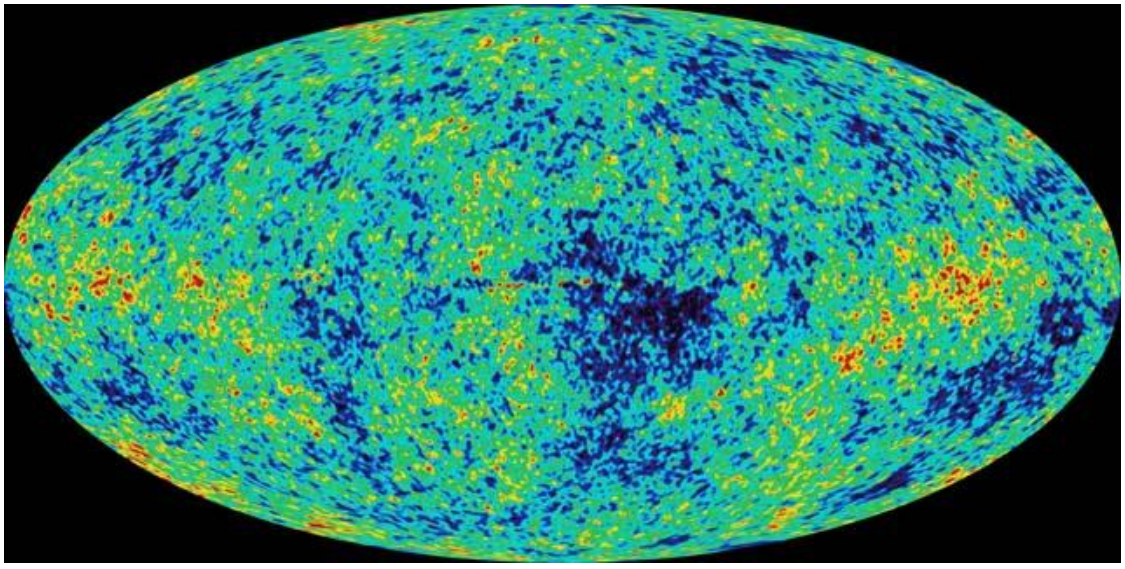


Fig. CMB or post-big bang Newly born fresh Universe (No Stars/Galaxies)

This is a good example of how science works: observations (the recession of galaxies) motivated a model (the expanding universe), which made a prediction (a glowing early Universe) that was verified by observations (the microwave background). The big bang theory is also justified by the basic facts of knowledge of Physics. The CMB signal detected by Penzias and Wilson is described as the "echo" of the Big Bang. Every echo heard represents a "signature" of the original sound. Here, the difference is that instead of an audible echo, the Big Bang left behind a heat signature throughout all of space.

Another prediction of the Big Bang theory is that the Universe should be receding from us. Specifically, any direction we look out into space, we should see objects moving away from us with a velocity proportional to their distance away from us, a phenomenon known as the red shift.

***CMB* -- Royal Swedish Academy's Dossier**

They called it the Mysterious background radiation. It has been known for a relatively long time that various astronomical objects emit radiation in the form of radio waves. Radio astronomy has grown in significance and is now a very important complement to classical optical

astronomy. The radiation is emitted in various ways; for example, hydrogen clouds in the Galaxy radiate when excited, and cosmic ray electrons radiate when spiralling in the weak magnetic fields of interstellar space. Various objects, such as single stars, galaxies and - quasars, have been found to emit radio waves. In order to study these radio sources, it is, of course, necessary that their radiation show up over the general background radiation. The composition and origin of this background were for a long time not well understood; it was assumed to consist of the integrated radiation from a great number of sources, both galactic and extragalactic.

The study of cosmic microwave radiation, and especially of the weak background radiation, obviously requires the use of a very sensitive receiver. Such an apparatus was built in the beginning of the 1960s at Bell Telephone Laboratories in America. It was originally used for radio communications with the satellites Echo and Telstar. When this instrument became available for research, the two radio astronomers, Arno Penzias and Robert Wilson, decided to use it for the study of microwave background radiation. It was very well suited for this purpose: the instrument noise, i.e., the radiation created by the instrument itself, was very low; furthermore, it was tuned to a wavelength of 7 centimeters.

Fig. Radio Telescope

It was already known that the intensity of cosmic microwaves decreases with decreasing wavelength; hence, the intensity at 7 centimeters would be expected to be quite low. However, to their surprise, Penzias and Wilson found a comparatively high intensity. They suspected at first that this radiation must originate either in the instrument or in the atmosphere. However, by painstaking testing, they showed that it came from outer space and that its intensity was the same in all directions. Hence, their measurements allowed the surprising conclusion that the universe is filled uniformly with microwave radiation.

These two researchers (Penzias and Wilson) made no suggestions about the origin of this mysterious radiation. When their discovery became known, however, it was found that speculations had already been made about the existence of a weak, microwave background radiation. The starting-point for these speculations had been a number of attempts, made during the 1940s, to explain the synthesis of chemical elements. A theory developed by the Russian-born American physicist, George Gamow and his associates suggested that this synthesis took place at the beginning of the existence of the universe.

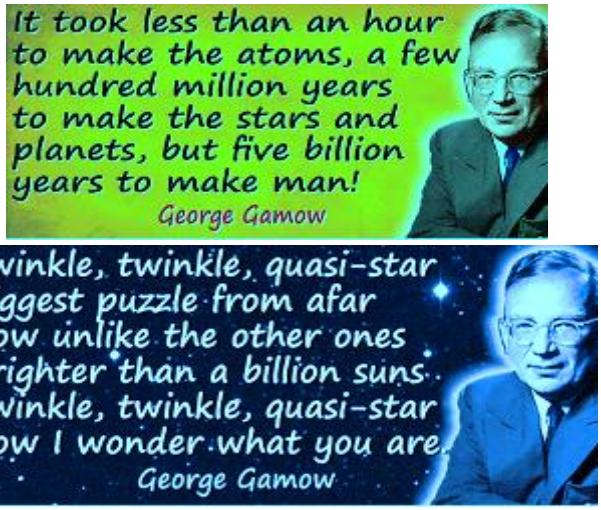


Fig. George Gamow- [original Russian Georgy Antonovich Gamov] developed the Big Bang Theory of the universe in the year 1948.

It is known from studies of the spectra of stars and galaxies that the universe is at present expanding uniformly. This means that at a certain point, 15 billion years ago, the universe was very compact; it is thus tempting to assume that the universe was created by a cosmic explosion, or 'big bang', although other explanations are possible. This 'big bang' theory implies the occurrence of very high

temperatures, of about 10 billion degrees. Only at those temperatures can various nuclear reactions take place such that chemical elements could be built up from the elementary particles assumed to be present from the very beginning. It also implies the release of a large amount of radiation, whose spectrum extends from the X-ray region, through visible light, to radio waves. After this hypothetical explosion, the temperature would decrease rapidly (the whole 'creation' is assumed to have been completed in a few minutes). The question then remains of what would have happened to the debris of the explosion: matter, consisting of hydrogen, helium and various other light elements, would have expanded as a hot cloud of gas which would gradually have cooled down to form condensations, which developed into galaxies and stars.

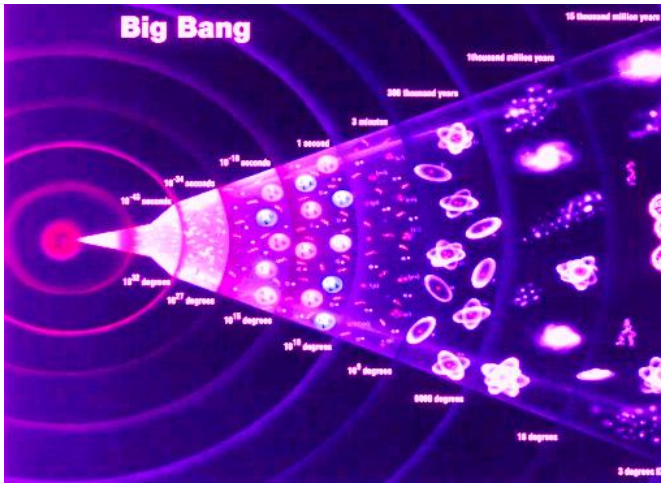


Fig. Big Bang Explosion piloting the creation of the Universe ejecting processes

But what about the radiation? Since the universe is virtually transparent to radiation of these wavelengths, nothing would really have happened to it: the radiation would expand in universe at the same rate as the universe is expanding. The question is whether it still exists and, if so, whether it can be detected. The difficulty here is that because of the expansion of the universe, the wavelength of the radiation has decreased, in the same way that light from distant galaxies is 'red-shifted' Instead of the 'hard' radiation that would have been emitted during the 'big bang', the radiation that might be detected now would correspond to that emitted by a body with a temperature of 3 degrees above absolute zero. No visible light is emitted at such a low temperature, and the radiation emitted falls: entirely within the microwave region, with a maximum intensity of about 0.1 centimeters. It was because of these difficulties that the early predictions were forgotten: it was assumed that it would be impossible to detect such weak radiation in the cosmic noise. When Penzias and Wilson discovered cosmic microwave background radiation, it was reasonable to suspect that it was fossil radiation from the 'big bang'. Support for this interpretation came from a number of investigations of the shape of the spectrum, which soon showed that it was indeed that which would be expected for a body with a temperature of 3 degrees. This provided solid support for the view that background radiation is the fossil remains of the 'big bang'; other interpretations are possible, however, even if they lack detailed theoretical backgrounds. The discovery of Penzias and Wilson was a fundamental one: it has made it possible to obtain information about cosmic processes that took place a very long time ago, at the time of the creation of the universe.

Fig. We all are Here in our Milkyway Galaxy with Wilson & Penzias & Swedish Academy !

Investigation of this radiation has been extended. Due to the fact that it fills the entire universe and interacts with interstellar and intergalactic matter, it can be used as a measuring probe. During the last few years it has been found that this radiation is not quite uniform and that its intensity has a certain directional dependence; this can be interpreted as an effect of the motion of the earth

and of the solar system relative to the radiation field, and its variation can be used to measure that motion. Since the distribution of the intensity of the radiation reflects the distribution of matter in the universe, the possibility is opened up of defining absolute motion in space. Thus, the discovery of cosmic microwave background radiation by Penzias and Wilson has marked an important stage in the science of cosmogony.

Non-controversial heterogeneousness of Universe

Universe is composed of parts of different kinds having widely dissimilar matter or material interior in those parts with variation in the number of such parts. This is called the heterogeneousness property of the post-big bang Universe. In other words, the Universe is about space-time and all parts that exist therein are classified as planets, stars, galaxies, contents of intergalactic space, the smallest subatomic particles, all matter and energy. Allotropic terms of the Universe are the cosmos, the world, reality, and nature. The 1 million stars closest to Earth in the Milky Way with the 100 closest galaxies are the main attraction drawing our attention to probe the Universe scientifically.

Controversial heterogenousness of Universe

All developments that have taken place in Science recently, up until the outset of the 21stcentury do not lead us to the singular fact whether the universe was created or autogenous one. If created, what is its source or origin and where is it ? If autogenous, Why but and for what? These follow up questions have still not decisive information as of now-a-days for the obvious reasons of either " Mind Absent – Body Present (MABP) " state of the genious fellows among the researchers of the Universe or lack of "Cosmic Star Light Material Technologies (CSLMT) "yet to be invented by the Hydrogen & Helium techno-nuclear-engineering.

Botany & Zoology Composted Universe

Universe is made of Matter, Energy & Space. The Big Bang scenario simply assumes that space , time & energy already existed but silent on where they came from or why the Universe was born hot and dense to begin with. The cosmic microwave background (CMB) radiation is a faint afterglow permeating the universe.

The Botany and Zoology on the Earth which is a planet of the Solar system as well as part and parcel of the Universe as a whole is a great contribution of the Universe (because of its elemental chemical origin firstly ever since its beginning 'happened' which we understand to be out of the big bang) and has indeed thereafter been progressively evolving on the Earth so far from our point of view besides the question of our own evolution on the Earth and the efforts to study the Universe *per se* concerned. Mentally, the human mind started searching for the extra-terrestrial life or aliens somewhere on other parts of the Universe thinking that it is unique and only one of its kind. Recently, new theories have also come up that the Universe is not only the one we have but there are many other multiple Universes possibly. Most of the cosmologists believe that the universe was created about 15 billion years ago with the Big Bang, a cosmic explosion that resulted in an expanding cloud containing only the two lightest elements—hydrogen and helium. The only real difference between planets and stars is mass – almost everything out there is made up of 75% hydrogen and 24% helium. In fact, Jupiter probably has an Earth-like ball of rock with 14 to 18 times the mass of the Earth at its core. If an object has about 80 times the mass of the Jupiter, it has sufficient mass and temperature to ignite solar fusion in its core. At the core of the Sun and other stars, atoms of hydrogen are being fused into atoms of helium. This process releases a tremendous amount of energy. If an object isn't performing some kind of fusion at its core, it's not a star. The small rocky terrestrial planets like the Earth and Mars make up just a fraction of the mass of the Solar System entirely. Planets orbit stars, no question. But we have multi-star systems

where stars are orbiting stars. And it's also possible that there are binary planets orbiting a common center of gravity and together they orbit around a star. In fact, the Sun is at the centre of the solar system of 9 planets including our Earth.

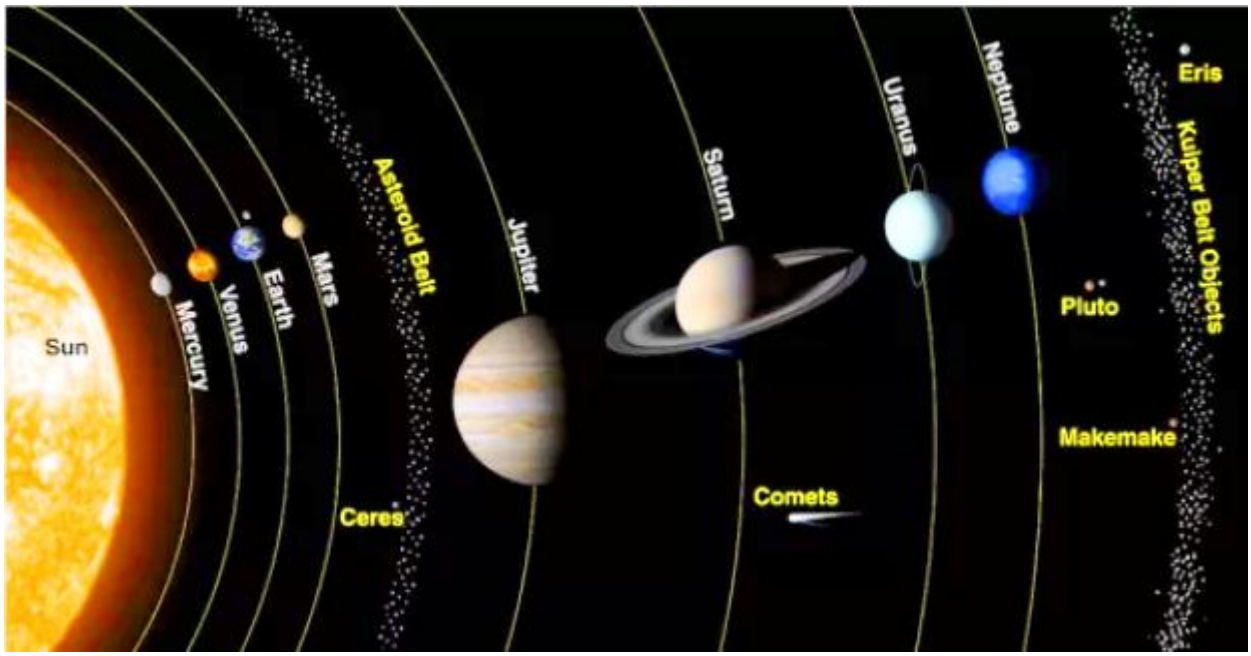


Fig. Organization of central Sun with its quality circle of 8 planets not letting them fall apart –a lateral view

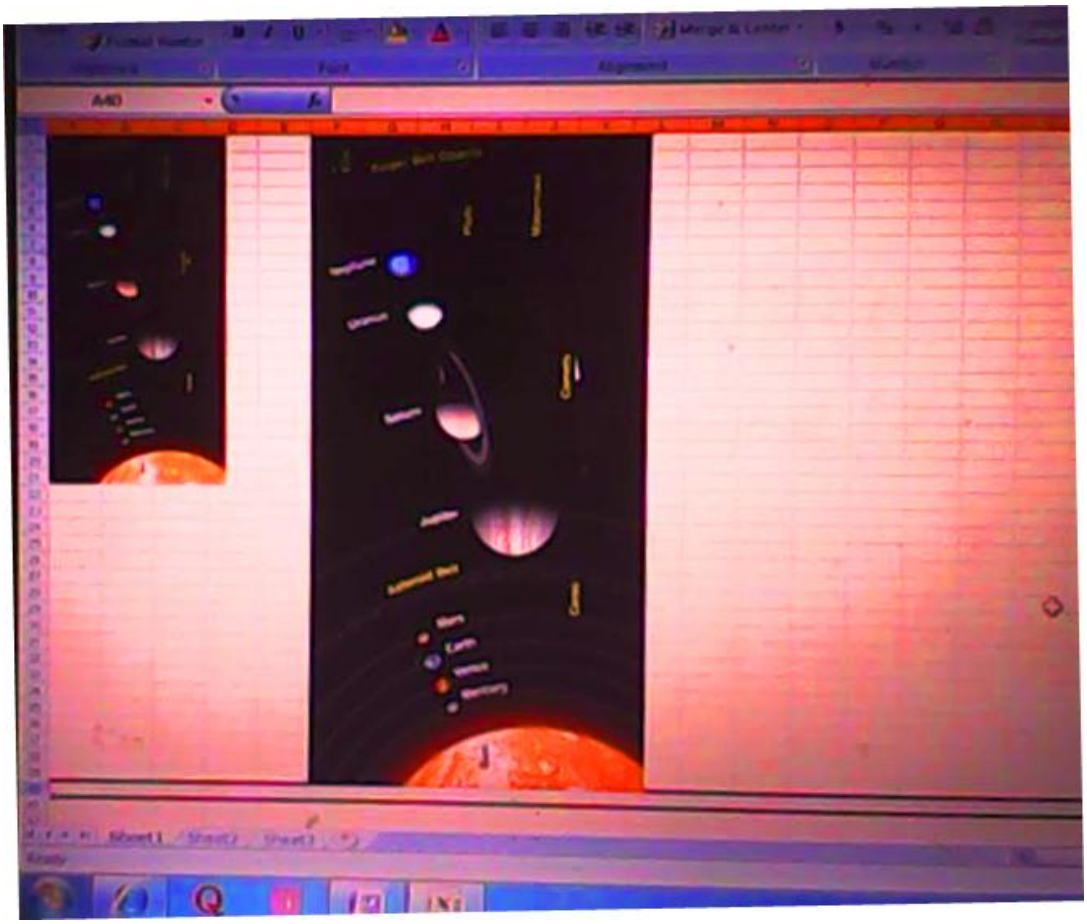


fig. Quality Circle of central Sun + 8 planets , ' height expansion' in the Universe— View .

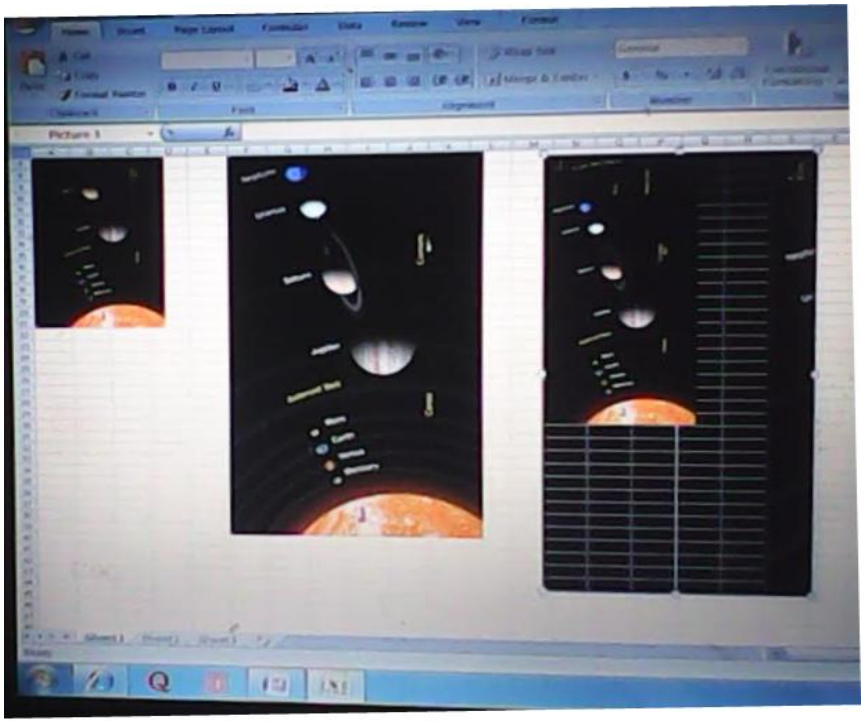


fig. Planets with Universe expansion & post-expansion Space Infinite

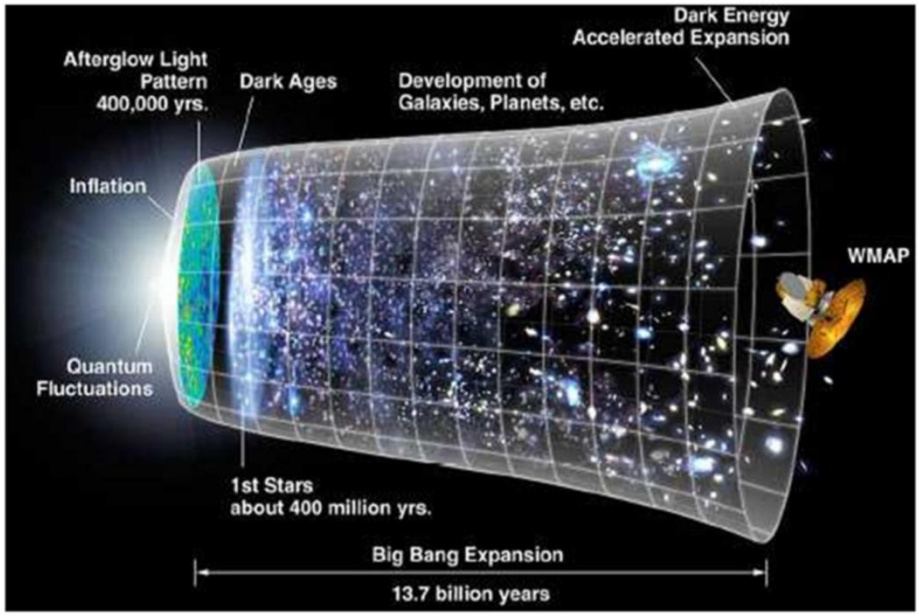


Fig. Unchallenged BIG BANG model enunciated by the Belgian-born Roman Catholic Priest & Astronomer, G. Lemaitre

.

>Lemaitre

Lemaitre imagined that if the Universe was expanding, it had to be expanding from somewhere and some point in time. He figured that if you traced the idea of the Universe back in time, all the way to the very beginning, everything had to converge into a single point.

Lemaitre called that point a super atom. He suggested that the expansion of the Universe had resulted from the explosion of this super atom that hurled materials in all directions and set the Universe as we know it in motion. Today, this is the standardized model by the name of Big Bang acknowledged universally and followed by Cosmologists. However, in the history it was

mentioned that on being told about this model by Lemaitre, Albert Einstein of the fame of energy can be neither created nor destroyed had remarked that Lemaitre's calculations were pretty good but his Physics was abominable!

The Big Bang theory, currently the best model scientists have for explaining the creation of the universe, said astrophysicist David Spergel of Princeton University. The CMB is one of the central pillars of the hot Big Bang theory. Many scientists have hailed CMB observations as strong evidence for the Big Bang.

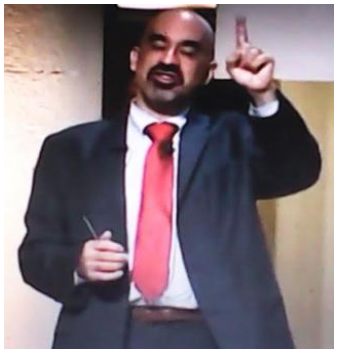


Fig. David Nathaniel Spergel, an American astrophysicist @ Princeton University Professor.

Kinetic Big Bang's Products & Time Evolution

Scientists believe that the Universe was initially so hot and dense, that even elementary particles like protons and neutrons could not exist. Instead, different types of matter called matter and anti-matter collided together, creating pure energy. But as the Universe began to cool, protons and neutrons began to form. Over time, these protons, neutrons and electrons came together to form Hydrogen and small amounts of Helium. During the billions of years that followed, stars, planets and galaxies formed to create the Universe as we see it during the current 21st Century among a host of unsettled issues to be answered by Science but varyingly concluded in different kinds of religious philosophies which, howsoever are not acceptable to the Practical Science and Order of the day .

Stars & Galaxies out after the Big Bang.

They came and will come in different sizes and colors. In a scientific sense, a star is ball of hydrogen and helium with enough mass that it can sustain nuclear fusion at its core. Our Sun is a star, of course.

Fig. After the Big Bang, gravitational attraction between denser regions of visible matter and halos of ***dark matter*** cause atoms to come together to form the first stars and galaxies.

Galaxy & a blackhole centric formation

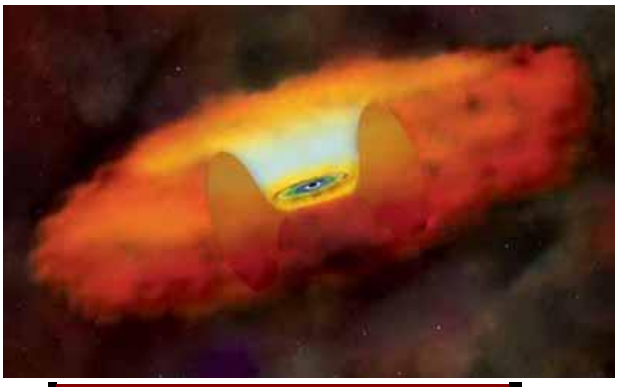
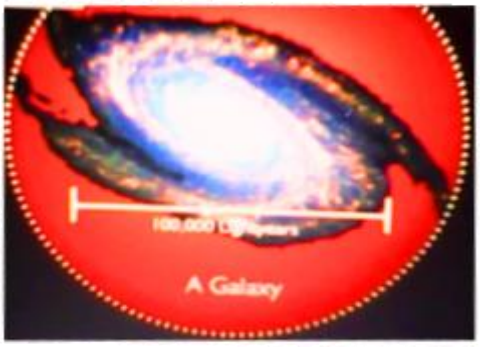


Fig. a black hole and forming galaxy.: such as merging galaxies or colliding black holes.

3. Solar System of Planets with Sun at the centre.



>Galaxy

>Galaxy

>milkiway galaxy

> Andromeda

>Night time view of the Milkyway Galaxy set in motion by the Big Bang 13.8 billion years ago .

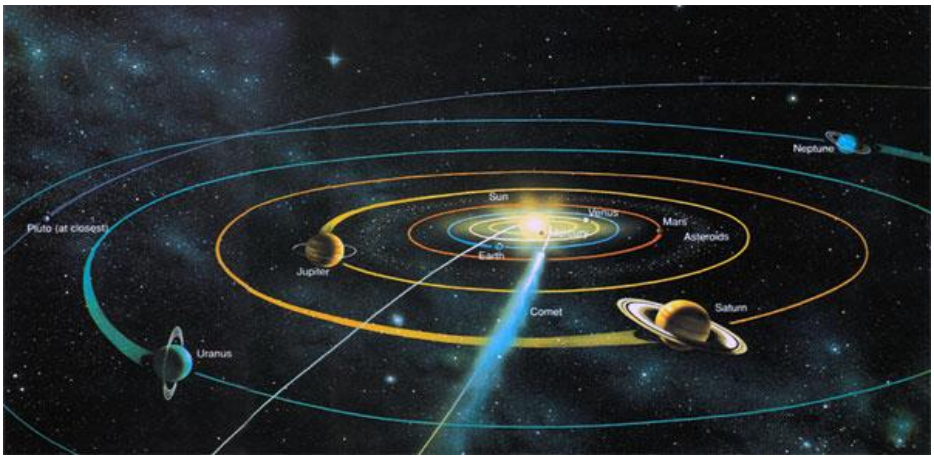
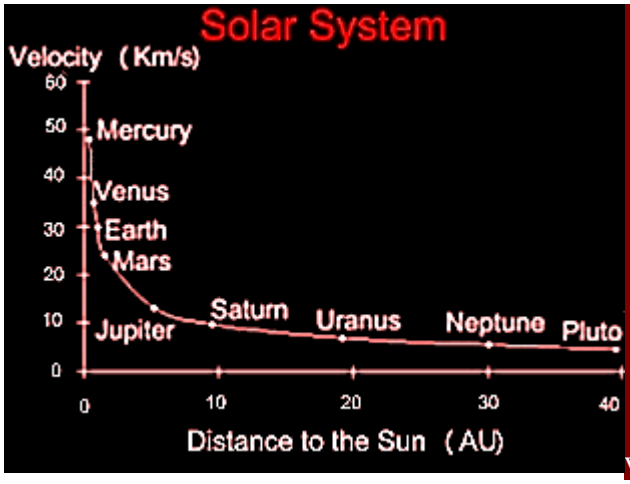


Fig. Solar System represented by 9 planets above including our home-Earth with Sun Centered.



velocity  of a planet is inversely proportional to its distance from the sun.

Fig. 9 planets revolve around their pilot Sun as their centre: Velocity & Distance scales.

4. Dark Matter & Dark Energy

Dark matter can shape the evolution of galaxies, scientists added. Dark matter is a mysterious substance thought to make up about 84 percent of the matter in the universe, and while dark matter is invisible, its presence can be inferred by its gravitational effects on visible matter. Scientists still don't know the exact mechanisms involved accelerating matter to high speeds. It appears a black hole anchoring an active galaxy draws gas inward. Some is swallowed, yet some is simply accelerated and then ejected in high-speed jets along the galaxy's axis of rotation. What we see are intense and twisted magnetic fields. This proves to us that there are physical processes at the cores of the galaxies which are extremely energetic and capable of propelling matter at high cosmic speed. Therefore, important parameters of the Universe such as mass, density, distance, electromagnetic energy, kinetic energy, temperature, size of a vast range of objects and their total number, gravity and energy-density help us with a macro perspective of the Universe .

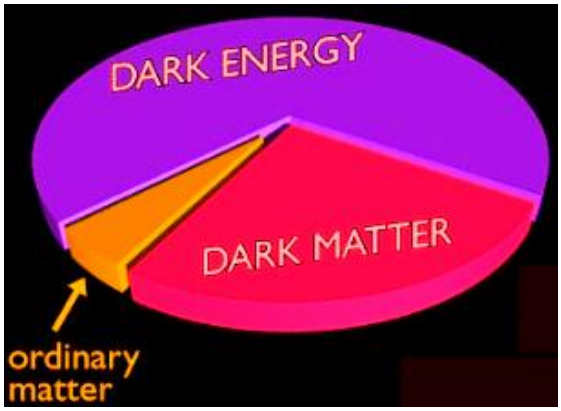
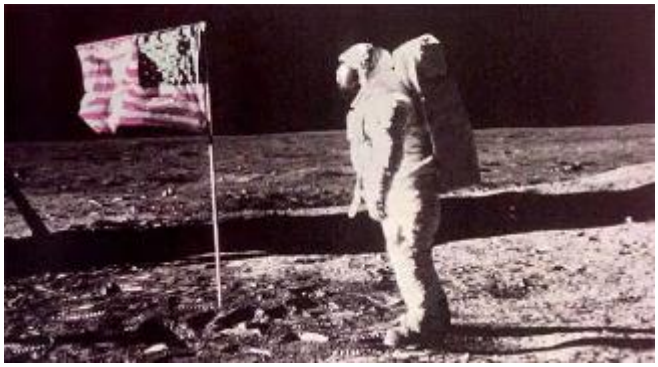


Fig .Composition of the Universe . Dark energy is **everywhere**. Dark energy is thought to be an inherent property of space itself. Also, called anti-gravity. However we don't notice dark energy mostly because it is an incredibly small amount of energy per volume & the universe is composed of just 4 percent regular matter (the atoms that make everything from people to clouds to stars), 25 percent dark matter (mysterious stuff that must be there but can't be seen), and the rest dark energy, an even more mysterious force that is driving the universe to expand at an ever-increasing pace.

Post-Big Bang Moon Kicked Under the feet of American Man



Trained Astronauts in photograph, from left Armstrong, Collins & Aldrin seen below .

Fig. H.E. Armstrong, the first-ever human being *a la* America alive on the Moon under his feet and standing with head held straight & high in the Universe above & below him, planting the American Flag in 1969 of the 20th Century Apollo Space Mission from America.

First Space Station:

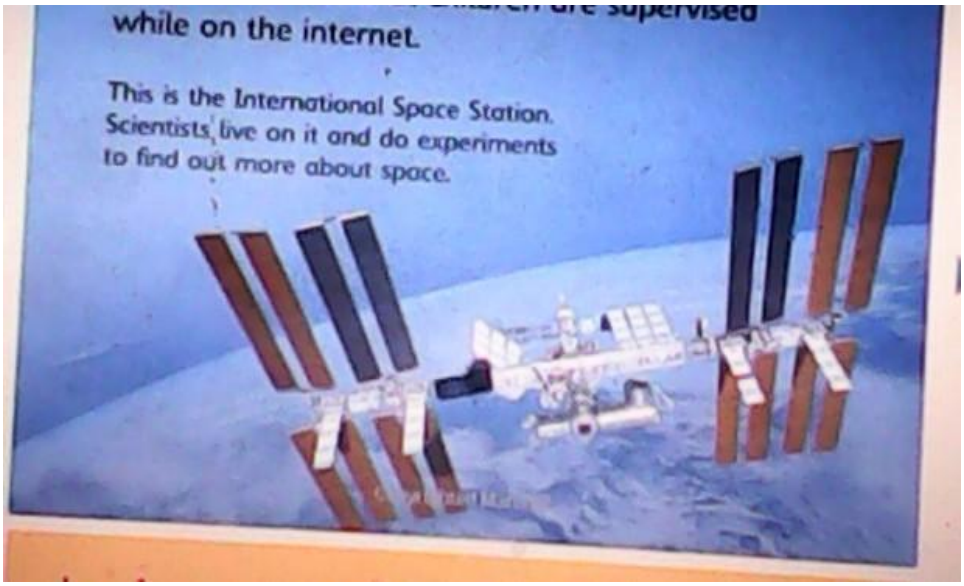


Fig . Real Space Station structures constructed in the outer deep Space out of human sight ability

Conclusion with the Bells's Theorem

Observations of the cosmic microwave background and the radiation left over from the Big Bang, are snapshots of the universe as it was only three hundred thousand years after the Big Bang. These observations have addressed many of the issues that have driven cosmology over the past decades: How old is the universe? What is its shape and size? What is the composition of the

universe? How do galaxies emerge? While there has been significant progress, many key cosmological questions remain unanswered: What happened during the first moments of the Big Bang? What is dark energy? What were the properties of the first stars? Only some future experiments and observations may start to answer these new and deeper knowledge issues.

Kinetic space theory is a way of describing the time evolution of Space consisting of a large number of objects. The constellations on the star sky are such typical spatial graphs or big bang's kinetic products, for instance, be the stars or the galaxies. This represent general notions of theory of graphs. When mathematically figured out, it leads to 'different' looking Space Graphs given their kinetic interunit nature. There is thus an analogy-scope-study from the Euler & Hamiltonian graph theory in the big-bang astronomical sky. Spatial Graphs of this type have attractions with the surface appearances differing from what is beneath in their formation with variety of Surface-Vertex- Show to the naked eye when observed through instruments, say, powerful telescopes of large capacity. It is well known that the visual structures of nearby galaxies are filamentary or bubble-like. Spiral galaxies are composed of very dense bulge and a flat disk containing spiral arms. Stars and clouds at large distances from the bulge of spiral galaxies follow orbits, and therefore, their velocities should decrease with the distance. Their velocities become constant at large distances from the galactic center. Furthermore, this has been also observed in other types of galaxies. These discrepancies are sometimes linked to dark matter that by some calculations account for 25% of the Universe's energy. While there are various theories about dark matter, none has yet proven to be satisfactory.

It is now urgent to mention Bell's Inequality Theorem which proved that the degree of cooperation between separated systems cannot exceed a certain definite maximum . In contrast, the quantum theory predicts that this limit can be exceeded. Alain Aspect of the University of Paris, Paris @France, provided an experimental proof of the Bell's Theorem in the year 1981. The implication of Bell's Theorem is that at a deep and fundamental level, the separate parts of the Universe are connected in an intricate and immediate way.

fig. John Stewart Bel

Some theoretical physicists, therefore, consider the whole Universe as one System of a vast network of particles of interconnectedness. Some of these connections are unseen because they are of the unmanifest order. Supporting this contention, there is also an incompleteness or limitation of an exact field of Mathematics because formal mathematical system of axioms and rules must contain some statements that are neither provable nor disprovable by means allowed within the system .Many of the 20th Century Mathematicians were faithful to the limit of reasoning logically which tends to the Infinity but turned hopeless when Gragor Canter provided a rigorous logical demonstration of the self-consistency of the actually infinite proving that there are in existence multiple infinities, not a single one alone. This made noble sense and apprehension of the Infinity all the more for the Mathematicians .But then, Chemistry and Physics retained their classical favour of something exact and superior to the rest of the fields of Knowledge to trace the super atom responsible and accountable for the big bang Universe.

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Biographical Sketch

The Author passed his Pre-Ph.D Course with Examination in the field of Graph Theory at the Andhra University, Andhra Pradesh State, in the year of 1981 at the Department of Applied Mathematics. Due to financial difficulties on the domestic front and the non-availability of an independent single room for Research Work & Study at the University Research Scholars Hostel for 3 years at the Andhra University, Waltair, in 1981 pending new rooms construction, the author joined the Dena Bank for pay-scale career as an Officer of Banking Statistics in Junior Management in the same year at Bombay (now Mumbai), Maharashtra State, Western India, which being a Nationalized Bank & Government of India Enterprise in the Banking Sector relinquishing the research -career-prospects in teaching line jobs having been awarded the C.S.I.R (Council of Scientific and Industrial Research) Junior Research Fellowship, NEW DELHI, INDIA , in 1981. The interest in Graph Theory & Applied Research prevails. To his credit, the Author has so far published 8 Research Papers in International Journals of Science & Technology besides GRAPH THEORY RESEARCH STUDIES & THE 46TH ANNUAL CONFERENCE @ THE INDIAN MATHEMATICAL SOCIETY CERTIFICATE. RESEARCH CONTRIBUTIONS: REGULAR GRAPHS / MATCHINGS IN GRAPHS , INDEPENDENT SETS IN GRAPHS, RESEARCH SEMINARS & FINAL SEMESTER LECTURES ON GRAPH THEORY: CLASS WORK, SEMESTER EXAMINATION & VALUATION & INVIGILATION