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Nucleosynthesis after frequency shifting in electromagnetic radiation near gravitating masses in Dynamic Universe Model

Satyavarapu Naga Parameswara Gupta (SNP Gupta)
Retired Assistant General Manager, Bhilai Steel Plant,
Res 1B / Street 57 / Sector 8 / Bhilai 490008
snp.gupta@gmail.com

snp.gupta@hotmail.com

Abstract: This paper is further to Dynamic Universe Model studies of the "light rays and other electromagnetic radiation" passing grazingly near any gravitating mass changes its frequency .This change in frequency will depend on relative direction of movement between mass and radiation. All these particles like "neutrinos, positrons, electrons, protons and neutrons" behave like waves also. We should remember the wave particle duality. Hence frequency enhancing is applicable here also. So in other words change in frequency can go further to converting radiation into matter like micro particles as stated above. Here in this paper we will discuss further into different element formations. And we will see some possible electrochemical reactions that are possible at high temperature and pressure for formation of these different elements.

Keywords: Dynamic Universe Model, Hubble Space telescope (HST), SITA simulations , singularity-free cosmology, Blue shifted Galaxies , Red shifted Galaxies, Grazing radiation frequency changes, Formation of Elements, Nucleosynthesis

1. Introduction:

General theory of relativity says that the frequency shift in electro-magnetic radiation near a gravitating mass happens in one direction only (Gravitational redshift). There in the EARLIER [21] paper we saw that Dynamic Universe Model says this frequency shift happens on both the sides of spectrum. That means towards the frequency of a mass like electron or positron or other particles also. In other words Dynamic Universe Model predicts conversion of energy into mass. We also should remember that though I am calling these as particles. All these particles like "neutrinos, positrons, electrons, protons and neutrons" behave like waves also. We should remember the wave particle duality. Hence frequency enhancing is applicable to these particles also.

Here in this paper we will further discuss formation of different elements. Main formation of (converting radiation) of photons of electromagnetic radiation into matter particles like particles of neutrinos, positrons, electrons, protons and neutrons was a slight enhancement of earlier paper. Such particles form Hydrogen or Helium. Some of these atoms will be attracted towards large gravitating masses like planets and stars. Remaining atoms which went far away will form Cosmic ray particles. That how there will be showers of Cosmic rays which we will discuss in the Cosmic ray formation section.

It may not be necessary to produce neutrons or neutrinos in initial stages. They can be created from some of the binding energy that was freed up as part of the fusion process. Proton creation would require that a 60Mev photon would have its frequency up shifted to about 3753Mev or close to 63 times its original frequency. So the shifting photon to proton would likely require a very large mass to make such a large frequency change in a single stroke. Or a CASCADE of stars can make this shift possible.

In a new star that has not converted much hydrogen into higher elements; the star is mostly composed of hydrogen. A basic hydrogen atom contains one proton and one electron. In the star the temperature is high enough to convert the atoms into plasma. Plasma is atoms with the electrons stripped off of from them. This means that the star contains free protons and free electrons. The first reaction is that two protons come together to form a nucleus. One of the protons decays into a neutron and a positron and neutrino which are both matter particles are given off as part of the process. This creates a deuterium atom, which is just a hydrogen atom that contains a neutron. This is what happens in SUN and Stars.

The next step is that the deuterium atom joins with another proton to form a Helium atom with just 1 neutron. A gamma ray energy photon is also given off because the energy required to bind the single Helium atom together is less than the energy of the separate proton and the deuterium atom combined. This gamma ray contains about 4Mev and comes completely from the savings in binding energy. The next step is for 2 of the above helium atoms to join together to produce a helium atom with 2 neutrons. The 2 extra protons are ejected. The protons carry off most of the freed binding energy about 15 to 20Mev in the form of kinetic energy or their motion. Energy released, higher atoms formed. Instead many hydrogen atoms have been combined together into fewer heavier atoms freeing up a small amount of energy in the process because the fewer heavier atoms require less total binding energy than the many more lighter hydrogen atoms required. For the most part, all of the matter is still there in the star it has just been compacted. It actually takes 4 hydrogen atoms (protons) to produce 1 helium atom. 2 of them are needed just as they are in the helium atom and the other 2 are converted into neutrons. The 4 protons contain a total of about 3753Mev. The fusion reaction freed up about 60MEV. In addition, all the heavier molecules upto uranium, are formed due to different nuclear reactions. There are many types of high energy particle bombardments that happen inside core of Stars, Cosmic ray bombardments and novae etc. The inside core of our own cool earth is not cool. Many elements are manufactured. The Novae and Supernovae and explosions of planets also contribute to different elements.

The other major elements are formed inside of stars; Magellanic Clouds, etc are formed as they are forming now, as explained by Hoyle. Those parts are not changed.

For the formation we require inside stars and planets. These star and planet centers will have the required high temperature and pressure. First of all we will discuss how mass gathers into these bigger stars and planets. Further sections will discuss about the electrochemical reactions required for formation of different elements.

The particles prepared in the process of energy conversion accumulate in the Magellanic Clouds or the star forming clouds or the dust regions of star forming Galaxies. If all the stars are formed during Bigbang why stars are formed again in a Galaxy?

2. History of Nucleosynthesis.

The first steps of element formation were probably taken in 1920, by Arthur Eddington, who proposed that stars obtained their energy from nuclear fusion of hydrogen to form helium and raised the possibility that the heavier elements are produced in stars. In 1939, in a paper entitled "Energy Production in Stars", Hans Bethe analyzed the different possibilities for reactions by which hydrogen is fused into helium. He defined two processes that he believed to be the sources of energy in stars. The first one, the proton–proton chain reaction, is the dominant energy source in stars with masses up to about the mass of the Sun. The second process, the carbon–nitrogen–oxygen cycle, which was also considered by Carl Friedrich von Weizsäcker in 1938, is most important in more massive stars. These works concerned the energy generation capable of keeping stars hot.

The history of Big Bang nucleosynthesis began with the calculations of Ralph Alpher in the 1940s. Alpher published the Alpher–Bethe–Gamow paper that outlined the theory of light-element production in the early universe. During the 1970s, there was a major puzzle in that the density of baryons as calculated by Big Bang nucleosynthesis was much less than the observed mass of the universe based on calculations of the expansion rate. This puzzle was resolved in large part by postulating the existence of dark matter.

That theory was begun by Fred Hoyle in 1946 with his argument that a collection of very hot nuclei would assemble into iron. Hoyle followed that in 1954 with a large paper describing how advanced fusion stages within stars would synthesize elements between carbon and iron in mass. This is the dominant work in stellar nucleosynthesis. It provided the roadmap to how the most abundant elements on Earth had been synthesized from initial hydrogen and helium, making clear how those abundant elements increased their galactic abundances as the galaxy aged.

Quickly, Hoyle's theory was expanded to other processes, beginning with the publication of a celebrated review paper in 1957 by Burbidge, Burbidge, Fowler and Hoyle (commonly referred to as the B2FH paper). This review paper collected and refined earlier research into a heavily cited picture that gave promise of accounting for the observed relative abundances of the elements; but it did not itself enlarge Hoyle's 1954 picture for the origin of primary nuclei as much as many assumed, except in the understanding of nucleosynthesis of those elements heavier than iron. Significant improvements were made by Alastair GW Cameron and by Donald D. Clayton. Cameron presented his own independent approach[13] (following Hoyle's approach for the most part) of Nucleosynthesis. He introduced computers into time-dependent calculations of evolution of nuclear systems.

A clear physical description of the proton–proton chain and of the CNO cycle appears in a 1968 textbook. Bethe's two papers did not address the creation of heavier nuclei, however. Clayton calculated the first time-dependent models of the S-process and of the R-process, as well as of the burning of silicon into the abundant alpha-particle nuclei and iron-group elements, and discovered radiogenic chronologies for determining the age of the elements. The entire research field expanded rapidly in the 1970s.

3. Concept:

There are many astrophysical processes which can be responsible for Nucleosynthesis. Mostly they happen in stars. They can be listed as nuclear fusion processes are known as hydrogen burning (via the proton-proton chain or the CNO cycle), helium burning, carbon burning, neon burning, oxygen burning and silicon burning. These processes are able to create elements up to and including iron and nickel. Heavier elements can be assembled within stars by a neutron capture process known as the s-process or in explosive environments, such as supernovae, by a number of other processes. Some of those others include the r-process, which involves rapid neutron captures, the rp-process, and the p-process (sometimes known as the gamma process).

Abundances of the chemical elements in the Solar System: The relative abundance of elements won't change according to Dynamic Universe Model. The next three elements (Li, Be, B) are rare because they are poorly synthesized in stars. The two general trends in the remaining stellar-produced elements are: (1) an alternation of abundance of elements according to whether they have even or odd atomic numbers, and (2) a general decrease in abundance, as elements become heavier. Dynamic Universe Model Nucleosynthesis will result in mass abundances of about 75% of hydrogen-1, about 25% helium-4, about 0.01% of deuterium and helium-3, trace amounts (on the order of 10−10) of lithium, and negligible heavier elements.

Those particles which are negatively charged will be attracting positive particles nearby due to electro-static attraction to make neutral particles or some may get converted back to lower frequencies. All these particles will have their own frequencies due to wave particle duality. Generally these radiation or particles will have very high speeds comparable to that of light.

The slower particles form clouds of interstellar medium or inter-galaxy medium observed in the Galaxies and in the Universe. From these clouds and dust higher accumulations are known are star forming clouds or AGN (Active Galactic Nuclei), which forms stars.

What happens in the core or other levels in a star depends mostly on its size and mass. Small stars less than ½ the size of the sun can only fuse hydrogen because they do not have enough mass to generate the pressure and temperature needed to fuse helium. Stars of the size of the sun can fuse hydrogen and helium, but can't fuse any larger atoms, as an example. Each time a heavier element is fused in a star it gives off less energy than the fusion of the previous next smaller atom. To say it in a different way, when you fuse helium atoms you get less energy freed up by the fusion process than you would when you fuse hydrogen atoms. You can still get some freed up energy by fusing atoms up to iron. **Large stars actually do fuse iron, but they do that just before they explode in a supernova.** When they fuse the iron it takes more energy to fuse it than is freed up, so the net effect is to cool the core, etc. When the core cools it cannot resist the pull of gravity, so it collapses. The end result is the supernova explosion. The fusion of iron and the lighter elements can produce elements up to about zinc by various processes. The larger elements are generally considered to be mostly made in the supernova explosions, etc.

That large mass would be exerting a great pull on the photon and it would likely pull the photon into itself before it could generate that large a frequency change. Some the photons would be escaping. It would be Blackhole to attract all the photons into it. But Blackholes are not there according to Dynamic Universe Model.

The light photon travelling at velocity of light will eventually escapes the inward pull of the large star. Because of its high velocity even it would then be subjected to the continual pull of the large mass as it travelled away from it and that pull would then WOUN'T downshift the photon's frequency again back to the 60Mev it had at the start. So some the photons which are formed thro passing a cascade of stars or passing by a large star will somehow converted into the protons and electrons while its frequency was still up shifted. These matter particles would not lose their speed immediately, but will lose their velocity close to light slowly. Hence these protons electrons positrons etc will lose motion as and becomes part of that some mass. It will not be the starting larger mass. They need not be pulled back into the large mass that had up-shifted the photon.

So it would likely be NOT only very large stars or Blackholes, etc. that would have any chance of producing that large of a frequency up-shift, but a CASCADE of stars also do the same thing. As there are no Blackholes, the only choices left are other two only. And the new matter particles that would which are left and not pulled into stars or planets are lost will become Cosmic rays. Those particles which or pulled into the small stars or large stars and fused along with its other hydrogen.

Lets observe and see. We have to first observe that there will be frequency shift and is happening. If it is not, there can be a fundamental mistake. But I don't think. The frequency shift is happening. We have yet to observe it. Many predictions of Dynamic Universe model came true. Lets see this. For me I never saw thro' a telescope till now. I don't have any access, I am not rich also to buy such equipment. I am just a theoretician.

Most of the heavier elements especially those up near and including uranium are generally not fused in stars as a normal part of their fusion process. Even large stars cannot generate the pressure and temperature needed to produce these heavy atoms. They are mostly produced in supernova explosions, etc. The earth is much too small in mass to generate the pressure and temperature necessary to even fuse hydrogen into helium.

With the formation of stars, heavier nuclei were created from hydrogen and helium by stellar nucleosynthesis, a process that continues today. Some of these elements, particularly those lighter than iron, continue to be delivered to the interstellar medium when low mass stars eject their outer envelope before they collapse to form white dwarfs. The remains of their ejected mass form the planetary nebulae observable throughout our galaxy.

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3.1.1. The process of conversion from energy into partices, is a continuous process. Electromagnetic radiation energy is created in stars. This radiation will be passing grazingly to some gravitating mass and will be converted back continuously into elementary particles at various gravitating masses. Slowly these various particles change into higher massive particles or may get bombarded into stars or planets. Here in this paper the formation of elements is divided into 6 processes. They are **Elementary particles and elements** generated in frequency changing process, **By Cosmic rays, By Small stars, By Large Stars, By Super Novae and Manmade elements By Neutron Stars.** This paper discusses mainly about first two categories. The other processes are standard processes.

3.1.2. **Elementary particles and elements** generated in frequency changing process. These are particles like "neutrinos, positrons, electrons, protons and neutrons etc" are used for generating during Nucleosynthesis for forming the elements hydrogen, helium, nuclei of hydrogen, nuclei of helium and alpha particles etc. This process is widespread, happens in the entire universe. Hence the production of positive ions of the simplest isotope of hydrogen 1H, which is nothing but a single proton is done in the element formation process near cascade of stars or near large stars. See the fig 1 for the details of other elements formation.

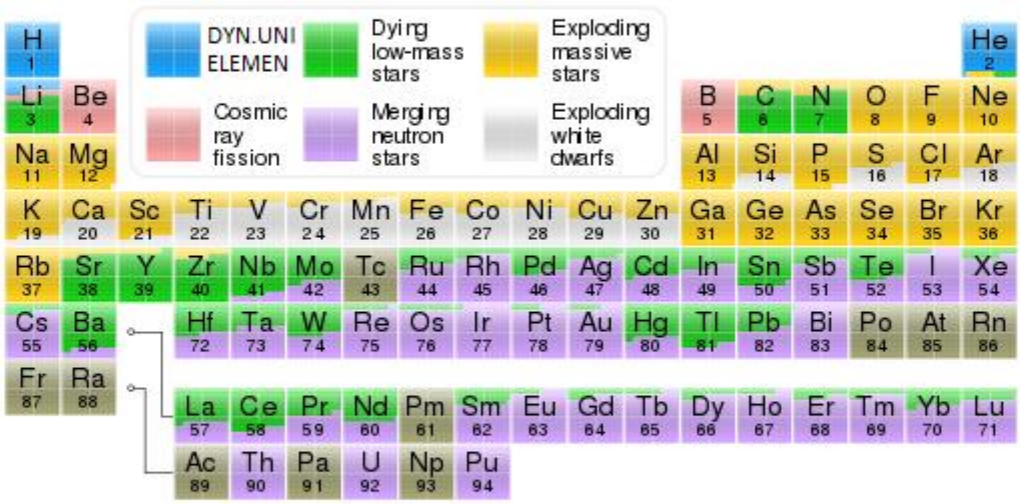

Fig1. A periodic table indicating the origins of elements including elements formed by Dynamic Universe Model frequency shifting is shown here. All elements above 94 are not incorporated which are including manmade elements. This table shows the elements made according this paper shown as DYN.UNI ELEMEN. This figure is originally from Wikipedia's Nucleosynthesis, and it was modified according to our paper here. This figure gives bird's eye view of this whole paper

3.1.3. **By Cosmic rays:** The elements lithium, barium and boron come under this category. We can see these elements are prepared in stellar Nucleosynthesis. Some of the particles in the universe will escape to the boundary of universe and will be attracted back into universe and such particles will become cosmic ray showers. Cosmic ray spallation, caused when cosmic rays impact the interstellar medium and fragment larger atomic species, is a significant source of the lighter nuclei, particularly ^{3}He, ^{9}Be and $^{10,11}B$, that are not created by stellar nucleosynthesis. Cosmic ray bombardment of elements on Earth also contribute to the presence of rare, short-lived atomic species called cosmogenic nuclides

Cosmic ray spallation process reduces the atomic weight of interstellar matter by the impact with cosmic rays, to produce some of the lightest elements present in the universe (though not a significant amount of deuterium). Most notably spallation is believed to be responsible for the generation of almost all of ^{3}He and the elements lithium, beryllium, and boron. The spallation process results from the impact of cosmic rays (mostly fast protons) against the interstellar medium. These impacts fragment carbon, nitrogen, and oxygen nuclei present. The process results in the light elements beryllium, boron, and lithium in cosmos at much greater abundances than they are within solar atmospheres. The light elements ^{1}H and ^{4}He nuclei are not a product of spallation and are represented in the cosmos with approximately primordial abundance. Beryllium and boron are not significantly produced by stellar fusion processes, since ^{8}Be is not particle-bound.
Due to Cosmic ray bombardments in proton-rich regions of the Magellanic clouds lithium-6, beryllium-9, and boron-11 could have been produced in the reactions:
$^{4}He + ^{2}H \rightarrow ^{6}Li + \gamma$
$^{7}Li + ^{3}H \rightarrow ^{9}Be + n$
$^{7}Li + ^{2}H \rightarrow ^{9}Be + \gamma$
$^{7}Be + ^{3}H \rightarrow ^{9}Be + p$
$^{9}Be + ^{3}H \rightarrow ^{11}B + n$

A star gains heavier elements by combining its lighter nuclei, hydrogen, deuterium, beryllium, lithium, and boron, which were found in the initial composition of the interstellar medium and hence the star. Interstellar gas therefore contains declining abundances of these light elements. Larger quantities of these lighter elements in the present universe are therefore thought to have been restored through billions of years of cosmic ray (mostly high-energy proton) mediated breakup of heavier elements in interstellar gas and dust. The fragments of these cosmic-ray collisions include the light elements Li, Be and B.

Stellar Nucleosynthesis : The proton-proton chain reaction

In 1939, Hans Bethe proposed that one of the protons could decay by beta emission into a neutron via the weak interaction during the brief moment of fusion, making deuterium a vital product in the chain.[23] This idea was part of the body of work in stellar nucleosynthesis for which Bethe won the Nobel Prize in Physics in 1967.

The first step is fusion of two ^{1}H nuclei (protons) into deuterium, releasing a positron and a neutrino as one proton changes into a neutron. It is a two-stage process; first, two protons fuse to form a diproton:

$${}_{1}^{1}H + {}_{1}^{1}H \rightarrow {}_{2}^{2}He + \gamma$$

followed by the beta-plus decay of the diproton to deuterium:

$${}_{2}^{2}He \rightarrow {}_{1}^{2}H + e^{+} + v_{e}$$

with the overall formula:

$${}_{1}^{1}H + {}_{1}^{1}H \rightarrow {}_{1}^{2}H + e^{+} + v_{e} + \gamma$$

This first step is extremely slow because the positron emission of the diproton to deuterium is extremely rare (the vast majority of the time, the diproton decays back into hydrogen-1 through proton emission). This is because the emission of the positron is brought about by the weak nuclear force, which is immensely weaker than the strong nuclear force and the electromagnetic force.

$$e- + e+ \rightarrow 2\gamma + 1.02 \text{ Mev}$$

The deuterium fuses with another proton to produce the light isotope of helium, ^{3}He:

$${}^{2}{}_{1}D + {}^{1}{}_{1}H \rightarrow {}^{3}{}_{2}He + \gamma + 5.49 \text{ MeV}$$

This process, mediated by the strong nuclear force rather than the weak force, is extremely fast by comparison to the first step.

From here there are four possible paths to generate ^{4}He.

In the Sun, ^{4}He synthesis via branch p-p I occurs with a frequency of 83.30 percent, p-p II with 16.68 percent, and p-p III with 0.02 percent. There is also the extremely rare p-p IV branch. Other even-rarer reactions may occur. The rate of these reactions is very low due to very small cross-sections, or because the number of reacting particles is so low that any reactions that might happen are statistically insignificant. This is partly why no mass-5 or mass-8 elements are seen. While the reactions that would produce them, such as a proton + helium-4 producing lithium-5, or two helium-4 nuclei coming together to form beryllium-8, may actually happen, these elements are not detected because there are no stable isotopes of atomic masses 5 or 8; the resulting products immediately decay into their initial reactants.

The overall reaction is:

$$4p \rightarrow {}^{4}He + 2e^{+} + 2v_{e}$$

The P-P I branch

$${}^{3}{}_{2}He + {}^{3}{}_{2}He \rightarrow {}^{4}{}_{2}He + 2\ {}^{1}{}_{1}H + 12.86 \text{ MeV}$$

The complete p-p I chain reaction releases a net energy of 26.732 MeV. Two percent of this energy is lost to the neutrinos that are produced. The p-p I branch is dominant at temperatures of 10 to 14 MK. Below 10 MK, the P-P chain does not produce much ^{4}He.

The P-P II branch

Proton–proton II chain reaction for Lithium processing. The P-P II branch is dominant at temperatures of 14 to 23 MK.

$^{3}_{2}He + ^{4}_{2}He \rightarrow ^{7}_{4}Be + \gamma$

$^{7}_{4}Be + e^{-} \rightarrow ^{7}_{3}Li + v_e + 0.861\ MeV\ /\ 0.383\ MeV$

$^{7}_{3}Li + ^{1}_{1}H \rightarrow 2\ ^{4}_{2}He$

Note that the energies in the equation above are not the energy released by the reaction. Rather, they are the energies of the neutrinos that are produced by the reaction. 90 percent of the neutrinos produced in the reaction of ^{7}Be to ^{7}Li carry an energy of 0.861 MeV, while the remaining 10 percent carry 0.383 MeV.

The P-P III branch

The Proton–proton III chain reaction are given below.

$^{3}_{2}He + ^{4}_{2}He \rightarrow ^{7}_{4}Be + \gamma$

$^{7}_{4}Be + ^{1}_{1}H \rightarrow ^{8}_{5}B + \gamma$

$^{8}_{5}B \rightarrow ^{8}_{4}Be + e^{+} + v_e$

$^{8}_{4}Be \rightarrow 2\ ^{4}_{2}He$

The P-P III chain is dominant if the temperature exceeds 23 MK. The p-p III chain is not a major source of energy in the Sun (only 0.11 percent), but it was very important in the solar neutrino problem because it generates very high energy neutrinos (up to 14.06 MeV).

The P-P IV (Hep) branch

This reaction is predicted theoretically, but it has never been observed due to its rarity (about 0.3 ppm in the Sun). In this reaction, helium-3 captures a proton directly to give helium-4, with an even higher possible neutrino energy (up to 18.8 MeV).

$^{3}_{2}He + 11H \rightarrow ^{4}_{2}He + e^{+} + v_e + 18.8\ MeV$

The PEP reaction

Proton–proton and electron-capture chain reactions in a star

Deuterium can also be produced by the rare pep (proton–electron–proton) reaction (electron capture):

$^{1}_{1}H + e^{-} + ^{1}_{1}H \rightarrow ^{2}_{1}D + v_e$

Both the pep and p-p reactions can be seen as two different Feynman representations of the same basic interaction, where the electron passes to the right side of the reaction as an antielectron. This is represented in the figure of proton–proton and electron-capture chain reactions in a star, available at the NDM'06 web site.

The most important reactions in stellar Nucleosynthesis are, Hydrogen fusion, Deuterium fusion, The proton–proton chain, The carbon–nitrogen–oxygen cycle, Helium fusion ,The triple-alpha process, The alpha process etc..

For Fusion of heavier elements: Lithium burning: a process found most commonly in brown dwarfs, Carbon-burning process, Neon-burning process, Oxygen-burning process, Silicon-burning process etc…

Production of elements heavier than iron: Neutron capture, The R-process, The S-process, Proton capture, The Rp-process, Photo-disintegration, The P-process etc…

3.1.4. **By Small stars**: Carbon, Nitrogen, Oxygen, Neon and sulphur are synthesised by small stars, but these can be produced by some medium and bigger stars also. Atomic numbers less than Iron are here. The first direct proof that nucleosynthesis occurs in stars was the astronomical observation that interstellar gas has become enriched with heavy elements as time passed. **As a result, stars that were born from it late in the galaxy**, formed with much higher initial heavy element abundances than those that had formed earlier. **Stellar nucleosynthesis creates these elements:** small amounts of the hydrogen isotope deuterium (2H or D), the helium isotope helium-3 (^{3}He), and a very small amount of the lithium isotope lithium-7 (^{7}Li). In addition to these stable nuclei, two unstable or radioactive isotopes were also produced: the heavy hydrogen isotope tritium (3H or T); and the beryllium isotope beryllium-7 (^{7}Be); but these unstable isotopes later decayed into ^{3}He and ^{7}Li, as above. Essentially all of the elements that are heavier than Hydrogen were created by stellar nucleosynthesis in evolving and exploding stars.
Neutrons can react with positrons or electron neutrinos to create protons and other products in one of the following reactions:

$n + e^{+} \leftrightarrow \text{anti-}v_{e} + p$

$n + v_{e} \leftrightarrow p + e^{-}$

For comparison sake, Big Bang nucleosynthesis (BBN) produced NO elements heavier than lithium, due to a bottleneck: the absence of a stable nucleus with 8 or 5 nucleons. Hence this makes BBN redundant and not required. In stars, the bottleneck is passed by triple collisions of helium-4 nuclei, producing carbon (the triple-alpha process). However, this process is very slow, taking tens of thousands of years to convert a significant amount of helium to carbon in stars.
The subsequent nucleosynthesis of the heavier elements requires the extreme temperatures and pressures found within stars and supernovas. Star formation has occurred continuously in the galaxy since that time. The elements found on Earth, the so-called primordial elements, were created prior to Earth's formation by stellar nucleosynthesis and by supernova nucleosynthesis. They range in atomic numbers

from Z=6 (carbon) to Z=94 (plutonium). Synthesis of these elements occurred either by nuclear fusion (including both rapid and slow multiple neutron capture) or to a lesser degree by nuclear fission followed by beta decay.

Stellar nucleosynthesis is the nuclear process by which new nuclei are produced. It occurs in stars during stellar evolution. It is responsible for the galactic abundances of elements from carbon to iron. Stars are thermonuclear furnaces in which H and He are fused into heavier nuclei by increasingly high temperatures as the composition of the core evolves. Of particular importance is carbon, because its formation from He is a bottleneck in the entire process. Carbon is produced by the triple-alpha process in all stars. Carbon is also the main element that causes the release of free neutrons within stars, giving rise to the s-process, in which the slow absorption of neutrons converts iron into elements heavier than iron and nickel. The products of stellar nucleosynthesis are generally dispersed into the interstellar gas through mass loss episodes and the stellar winds of low mass stars. **The obvious reason is the is Gas is most targeted place for the newly formed particles.**

Deuterium is in some ways the opposite of helium-4 in that while helium-4 is very stable and very difficult to destroy, deuterium is only marginally stable and easy to destroy. The temperatures, time, and densities were sufficient to combine a substantial fraction of the deuterium nuclei to form helium-4 but insufficient to carry the process further using helium-4 in the next fusion step.

Deuterium fusion, also called deuterium burning, is a nuclear fusion reaction that occurs in stars and some substellar objects, in which a deuterium nucleus and a proton combine to form a helium-3 nucleus. It occurs as the second stage of the proton–proton chain reaction, in which a deuterium nucleus formed from two protons fuses with another proton.

Deuterium is the most easily fused nucleus available to accreting protostars, and such fusion in the center of protostars can proceed when temperatures exceed 106 K. The reaction rate is so sensitive to temperature that the temperature does not rise very much above this. The energy generated by fusion drives convection, which carries the heat generated to the surface.

If there was no deuterium fusion, there would be no stars with masses more than about two or three times the mass of the Sun in the pre-main-sequence phase as the more intense hydrogen fusion would occur and prevent the object from accreting matter. Deuterium fusion allows further accretion of mass by acting as a thermostat that temporarily stops the central temperature from rising above about one million degrees, a temperature not hot enough for hydrogen fusion, but allowing time for the accumulation of more mass. When the energy transport mechanism switches from convective to radiative, energy transport slows, allowing the temperature to rise and hydrogen fusion take over in a stable and sustained way. Hydrogen fusion will begin at 107 K.

Overview of the CNO-I cycle. The helium nucleus is released at the top-left step. Hydrogen fusion (nuclear fusion of four protons to form a helium-4 nucleus is the dominant process that generates energy in the cores of main-sequence stars. There are two predominant processes by which stellar hydrogen fusion occurs: proton-proton chain and the carbon-nitrogen-oxygen (CNO) cycle. Ninety percent of all stars, with the exception of white dwarfs, are fusing hydrogen by these two processes.

In the cores of lower-mass main-sequence stars such as the Sun, the dominant energy production process is the proton–proton chain reaction. This creates a helium-4 nucleus through a sequence of chain reactions that begin with the fusion of two protons to form a deuterium nucleus (one proton plus one neutron) along with an ejected positron and neutrino. In each complete fusion cycle, the proton–proton chain reaction releases about 26.2 MeV. The proton–proton chain reaction cycle is relatively insensitive to temperature; a 10% rise of temperature would increase energy production by this method by 46%, hence, this hydrogen fusion process can occur in up to a third of the star's radius and occupy half the star's mass. For stars above 35% of the Sun's mass,]the energy flux toward the surface is sufficiently low and energy transfer from the core region remains by radiative heat transfer, rather than by convective heat transfer. As a result, there is little mixing of fresh hydrogen into the core or fusion products outward.

3.1.5. **By Large Stars:** The detection of technetium in the atmosphere of a red giant star in 1952, by spectroscopy, provided the first evidence of nuclear activity within stars. Because technetium is radioactive, with a half-life much less than the age of the star, its abundance must reflect its recent creation within that star. Equally convincing evidence of the stellar origin of heavy elements, is the large overabundances of specific stable elements found in stellar atmospheres of asymptotic giant branch stars. Observation of barium abundances some 20-50 times greater than found in unevolved stars is evidence of the operation of the s-process within such stars.

Many modern proofs of stellar nucleosynthesis are provided by the isotopic compositions of stardust, solid grains that have condensed from the gases of individual stars and which have been extracted from meteorites. Stardust is one component of cosmic dust, and is frequently called presolar grains. The measured isotopic compositions in stardust grains demonstrate many aspects of nucleosynthesis within the stars from which the grains condensed during the star's late-life mass-loss episodes.

Hydrogen fusion requires much higher temperatures and pressures than does deuterium fusion, hence, there are objects massive enough to burn deuterium but not massive enough to burn hydrogen. These objects are called brown dwarfs, and have masses between about 13 and 80 times the mass of Jupiter. Brown dwarfs may shine for a hundred million years before their deuterium supply is burned out. Objects above the deuterium-fusion minimum mass (deuterium burning minimum mass, DBMM) will fuse all their deuterium in a very short time (~4–50 Myr), whereas objects below that will burn little, and hence, preserve their original deuterium abundance. "The apparent identification of free-floating objects, or rogue planets below the DBMM would suggest that the formation of star-like objects extends below the DBMM."

In higher-mass stars, the dominant energy production process is the CNO cycle, which is a catalytic cycle that uses nuclei of carbon, nitrogen and oxygen as intermediaries and in the end produces a helium nucleus as with the proton-proton chain. During a complete CNO cycle, 25.0 MeV of energy is released. The difference in energy production of this cycle, compared to the proton–proton chain reaction, is accounted for by the energy lost through neutrino emission. The CNO cycle is very temperature sensitive, a 10% rise of temperature would produce a 350% rise in energy production. About 90% of the CNO cycle energy generation occurs within the inner 15% of the star's mass, hence it is strongly concentrated at the core. The core region becomes a convection zone, which stirs the hydrogen fusion region and keeps it well mixed with the surrounding proton-rich region. This core convection occurs in stars where the CNO cycle contributes more than 20% of the total energy. As the star ages and the core temperature increases, the region occupied by the convection zone slowly shrinks from 20% of the mass down to the inner 8% of the mass. Our Sun produces 10% of its energy from the CNO cycle.

The type of hydrogen fusion process that dominates in a star is determined by the temperature dependency differences between the two reactions. The proton–proton chain reaction starts at temperatures about 4×106 K, making it the dominant fusion mechanism in smaller stars.

The Triple-alpha process and Alpha process: Main sequence stars accumulate helium in their cores as a result of hydrogen fusion, but the core does not become hot enough to initiate helium fusion. Helium fusion first begins when a star leaves the red giant branch after accumulating sufficient helium in its core to ignite it. In stars around the mass of the sun, this begins at the tip of the red giant branch with a helium flash from a degenerate helium core and the star moves to the horizontal branch where it burns helium in its core. Cepheid variables fuse helium until the core is largely carbon and oxygen. The most massive stars become supergiants when they leave the main sequence and quickly start helium fusion as they become red supergiants. After helium is exhausted in the core of a star, it will continue in a shell around the carbon-oxygen core.

In all cases, helium is fused to carbon via the triple-alpha process. This can then form oxygen, neon, and heavier elements via the alpha process. In this way, the alpha process preferentially produces elements with even numbers of protons by the capture of helium nuclei. Elements with odd numbers of protons are formed by other fusion pathways.

3.1.6. **By Super Novae:** Supernova nucleosynthesis occurs in the energetic environment in supernovae, in which the elements between silicon and nickel are synthesized in quasiequilibrium established during fast fusion that attaches by reciprocating balanced nuclear reactions to 28Si. From aluminium silicon to Uranium, Neptunium and plutonium. Many elements in this list are produced by large stars also. Supernova nucleosynthesis within exploding stars by fusing carbon and oxygen is responsible for the abundances of elements between magnesium (atomic number 12) and nickel (atomic number 28). This is also responsible for the creation of rarer elements heavier than iron and nickel, and uranium and thorium, in the last few seconds of a type II supernova event. The synthesis of these heavier elements absorbs energy as they are created, from the energy produced during the supernova explosion.

Explosive nucleosynthesis the r-process, rp-process, and Supernova nucleosynthesis etc..

Quasiequilibrium can be thought of as almost equilibrium except for a high abundance of the 28Si nuclei in the feverishly burning mix. This concept was the most important discovery in nucleosynthesis theory of the intermediate-mass elements since Hoyle's 1954 paper because it provided an overarching understanding of the abundant and chemically important elements between silicon (A=28) and nickel (A=60). It replaced the incorrect although much cited alpha process of the B^2FH paper, which inadvertently obscured Hoyle's better 1954 theory. Further nucleosynthesis processes can occur, in particular the r-process (rapid process) described by the B^2FH paper and first calculated by Seeger, Fowler and Clayton, in which the most neutron-rich isotopes of elements heavier than nickel are produced by rapid absorption of free neutrons. The creation of free neutrons by electron capture during the rapid compression of the supernova core along with assembly of some neutron-rich seed nuclei makes the r-process a primary process, and one that can occur even in a star of pure H and He. This is in contrast to the B^2FH designation of the process as a secondary process. This promising scenario, though generally supported by supernova experts, has yet to achieve a totally satisfactory calculation of r-process abundances. The primary r-process has been confirmed by astronomers who have observed old stars born when galactic metallicity was still small, that nonetheless contain their complement of r-process nuclei; thereby demonstrating that the metallicity is a product of an internal process. The r-process is responsible for our natural cohort of radioactive elements, such as uranium and thorium, as well as the most neutron-rich isotopes of each heavy element. The rp-process (rapid proton) involves the rapid absorption of free protons as well as neutrons, but its role and its existence are less certain.

Explosive nucleosynthesis occurs too rapidly for radioactive decay to decrease the number of neutrons, so that many abundant isotopes with equal and even numbers of protons and neutrons are synthesized by the silicon quasiequilibrium process. During this process, the burning of oxygen and silicon fuses nuclei that themselves have equal numbers of protons and neutrons to produce nuclides which consist of whole numbers of helium nuclei, up to 15 (representing 60Ni). Such multiple-alpha-particle nuclides are totally stable up to 40Ca (made of 10 helium nuclei), but heavier nuclei with equal and even numbers of protons and neutrons are tightly bound but unstable. The quasiequilibrium produces radioactive isobars 44Ti, 48Cr, 52Fe, and 56Ni, which (except 44Ti) are created in abundance but decay after the explosion and leave the most stable isotope of the corresponding element at the same atomic weight. The most abundant and extant isotopes of elements produced in this way are 48Ti, 52Cr, and 56Fe. These decays are accompanied by the emission of gamma-rays (radiation from the nucleus), whose spectroscopic lines can be used to identify the isotope created by the decay. The detection of these emission lines were an important early product of gamma-ray astronomy.

The most convincing proof of explosive nucleosynthesis in supernovae occurred in 1987 when those gamma-ray lines were detected emerging from supernova SN 1987A. Gamma ray lines identifying 56Co and 57Co nuclei, whose radioactive half-lives limit their age to about a year, proved that they were created by their radioactive cobalt parents. This nuclear astronomy observation was predicted in 1969 as a way to confirm explosive nucleosynthesis of the elements, and that prediction played an important role in the planning for NASA's Compton Gamma-Ray Observatory.
Other proofs of explosive nucleosynthesis are found within the stardust grains that condensed within the interiors of supernovae as they expanded and cooled. Stardust grains are one component of cosmic dust. In particular, radioactive 44Ti was measured to be very abundant within supernova stardust grains at the time they condensed during the supernova expansion. This confirmed a 1975 prediction of the identification of supernova stardust (SUNOCONs), which became part of the pantheon of presolar grains. Other unusual isotopic ratios within these grains reveal many specific aspects of explosive nucleosynthesis.

3.1.7. **Manmade elements:** The last elements in the periodical table are produced artificially. A few minor natural processes continue to produce very small numbers of new nuclides on Earth. These nuclides contribute little to their abundances, but may account for the presence of specific new nuclei.

Very small amounts of certain nuclides are produced on Earth by artificial means. Those are our primary source, for example, of technetium. However, some nuclides are also produced by a number of natural means that have continued after primordial elements were in place.

Radioactive decay may lead to radiogenic daughter nuclides. The nuclear decay of many long-lived primordial isotopes, especially uranium-235, uranium-238, and thorium-232 produce many intermediate daughter nuclides, before they too finally decay to isotopes of lead. The Earth's natural supply of elements like radon and polonium is via this mechanism. The atmosphere's supply of argon-40 is due mostly to the radioactive decay of potassium-40 in the time since the formation of the Earth. Little of the atmospheric argon is primordial. Helium-4 is produced by alpha-decay, and the helium trapped in Earth's crust is also mostly non-primordial. In other types of radioactive decay, such as cluster decay, larger species of nuclei are ejected (for example, neon-20), and these eventually become newly formed stable atoms.

Radioactive decay may lead to spontaneous fission. This is not cluster decay, as the fission products may be split among nearly any type of atom. Thorium-232, uranium-235, and uranium-238 are primordial isotopes that undergo spontaneous fission. Natural technetium and promethium are produced in this manner.

Nuclear reactions: Naturally-occurring nuclear reactions powered by radioactive decay give rise to so-called nucleogenic nuclides. This process may also cause the production of further subatomic particles, such as neutrons. Neutrons can also be produced in spontaneous fission and by neutron emission. These neutrons can then go on to produce other nuclides via neutron-induced fission, or by neutron capture. For example, some stable isotopes such as neon-21 and neon-22 are produced by several routes of nucleogenic synthesis, and thus only part of their abundance is primordial.

Nuclear reactions due to cosmic rays. By convention, these reaction-products are not termed "nucleogenic" nuclides, but rather cosmogenic nuclides. Cosmic rays continue to produce new elements on Earth by the same cosmogenic processes discussed above that produce primordial beryllium and boron. One important example is carbon-14, produced from nitrogen-14 in the atmosphere by cosmic rays. Iodine-129 is another example.

3.1.8 **Neutron star collision**: In addition to artificial processes, it is postulated that neutron star collision is the main source of elements heavier than iron. Neutron star collisions occur in a fashion similar to Type Ia supernovae. When two neutron stars orbit each other closely, they spiral inward as time passes. They may colloid with each other. This creates a magnetic field that is trillions of times stronger than that of Earth, in a matter of one or two milliseconds. Astronomers believe that this event is what creates certain kinds of gamma-ray bursts.

3.1.9 This completes some general introduction about formation of all the elements in the Universe without any Big bang and using only Dynamic Universe model, Now lets see what is this Dynamic Universe Model……………

3.2. About Dynamic Universe Model and Blue and Red shifted Galaxies:

In this Dynamic Universe Model – Galaxies in a cluster are rotating and revolving. Depending on the position of observer's position relative to the set of galaxies, some may appear to move away, and others may appear to come near. The observer may also be residing in another solar system, revolving around the center of Milky Way in a local group. He is observing the galaxies outside. Many times he can observe only the coming near or going away component of the light ray called Hubble components. The other direction cosines of the movement may not be possible to measure exactly in many cases. It is an immensely complicated problem to untangle the two and pin point the cause of non–Hubble velocities. This question was discussed by JV. Narlikar in (1983) see the ref [18]. 'Nearby Galaxies Atlas' published by Tully and Fischer contains detailed maps and distribution of speeds of Galaxies in the relatively local region.[4] The multi component model used by them uses the method of least squares. Hence we can say that Galactic velocities are possible in all the directions.

Dynamic Universe model is a singularity free tensor based math model. The tensors used are linear without using any differential or integral equations. Only one calculated output set of values exists. Data means properties of each point mass like its three dimensional coordinates, velocities, accelerations and it's mass. Newtonian two-body problem used differential equations. Einstein's general relativity used tensors, which in turn unwrap into differential equations. Dynamic Universe Model uses tensors that give simple equations with interdependencies. Differential equations will not give unique solutions. Whereas Dynamic Universe Model gives a unique solution of positions, velocities and accelerations; for each point mass in the system for every instant of time. This new method of Mathematics in Dynamic Universe Model is different from all earlier methods of solving general N-body problem.

This universe exists now in the present state, it existed earlier, and it will continue to exist in future also in a similar way. All physical laws will work at any time and at any place. Evidences for the three dimensional rotations or the dynamism of the universe can be seen in the streaming motions of local group and local cluster. Here in this dynamic universe, both the red shifted and blue shifted Galaxies co-exist simultaneously.

Because of the dynamism built in the model, the universe does not collapse into a lump (due to Newtonian gravitational static forces). This Model depicts the three dimensional orbit formations of involved masses or celestial bodies like in our present universe.

A point to be noted here is that the Dynamic Universe Model never reduces to General relativity on any condition. It uses a different type of mathematics based on Newtonian physics. This mathematics used here is simple and straightforward. As there are no differential equations present in Dynamic Universe Model, the set of equations give single solution in x y z Cartesian coordinates for every point mass for every time step. All the mathematics and the Excel based software details are explained in the three books published by the author[14, 15, 16] In the first book, the solution to N-body problem-called Dynamic Universe Model (SITA) is presented; which is singularity-free, inter-body collision free and dynamically stable. The Basic Theory of Dynamic Universe Model published in 2010 [14]. The second book in the series describes the SITA software in EXCEL emphasizing the singularity free portions. This book written in 2011 [15] explains more than 21,000 different equations. The third book describes the SITA software in EXCEL in the accompanying CD / DVD emphasizing mainly HANDS ON usage of a simplified version in an easy way. The third book is a simplified version and contains explanation for 3000 equations instead of earlier 21000 and this book also was written in 2011[16]. The fourth book (2012) [20] in the series on Dynamic Universe Model: SITA, gave simulations that predicted the existence of the large number of Blue-shifted Galaxies in 2004, ie., more than about 35 ~ 40 Blue-shifted Galaxies known at the time of Astronomer Edwin Hubble in 1930s. The far greater numbers of Blue-shifted galaxies was confirmed by the Hubble Space Telescope (HST) observations in the year 2009. Some of the other papers published by the author are available at refs. [3, 5, 8, 9, 10, 11, 17, 19].

SITA solution can be used in many places like presently unsolved applications like Pioneer anomaly at the Solar system level, Missing mass due to Star circular velocities and Galaxy disk formation at Galaxy level etc. Here we are using it for prediction of blue shifted Galaxies.

With axioms like… No Isotropy; No Homogeneity; No Space-time continuum; Non-uniform density of matter(Universe is lumpy); No singularities; No collisions between bodies; No Blackholes; No warm holes; No Bigbang; No repulsion between distant Galaxies; Non-empty Universe; No imaginary or negative time axis; No imaginary X, Y, Z axes; No differential and Integral Equations mathematically; No General Relativity and Model does not reduce to General Relativity on any condition; No Creation of matter like Bigbang or steady-state models; No many mini Bigbangs; No Missing Mass; No Dark matter; No Dark energy; No Bigbang generated CMB detected; No Multi-verses etc.

Many predictions of Dynamic Universe Model came true, like Blue shifted Galaxies and no dark matter. Dynamic Universe Model gave many results otherwise difficult to explain

4.1. Derivation of equations for the effect of movement of gravitational mass on the frequency of the incoming light ray with c:

The rest mass of the photon is = $m = E / c^2$. Gravitational field of the mass (Sun or star or some gravitational mass) = g_o . The distance of the photon from center = r . Energy = $E\, g_o\, r / c^2$. Frequency of photon = $\vartheta = E / h$ or $E = h\vartheta$.

***Case1**. When the velocity of gravitational mass is opposite to the incoming light ray:*

In this case the gravitational field will act as some brake on the incoming light ray.

The gravitating mass is moving with a velocity μ in the opposite direction and applies brake on the photon. This is something similar to the case where the gravitational mass is fixed in position and the photon of the rest mass E / c^2 is moving with velocity $\mu + c$

Hence the initial velocity of photon = $-\mu - c$. It's velocity is towards the gravitational mass. The photon is having a freefall. Its final velocity = $-\mu - c - g_o t$ [where t is the time of flight of photon].

Initial Energy = $m\,(\mu+c)^2 /2 = E\,(\mu+c)^2 /2\, c^2 = E\,(\mu^2 + c^2 + 2\mu c)/2c^2$

Final Energy = $\frac{1}{2}(E/c^2)(-\mu - c - g_o t)^2 = \frac{1}{2}(E/c^2)(\mu^2 + c^2 + g_o^2 t^2 + 2\mu g_o t + 2c g_o t + 2\mu c)$

Change in Energy = $\frac{1}{2}(E/c^2)(g_o^2 t^2 + 2\mu g_o t + 2c g_o t)$, here $E = h\vartheta$ that means

Change in Energy = $\frac{1}{2}(h\vartheta/c^2)(g_o^2 t^2 + 2\mu g_o t + 2c g_o t)$

Hence change in Frequency = $\vartheta = 1/\{2(h/c^2)(g_o^2 t^2 + 2\mu g_o t + 2c g_o t)\}$ (32)

Here the frequency increases. The incoming ray from a distant Galaxy will be Red shifted.

Case2*. When the velocity of gravitational mass is same direction as the incoming light ray:*

In this case the gravitational field will enhance the energy of the incoming light ray.

The gravitating mass is moving with a velocity μ in the same direction and enhances energy of the photon. This is something similar to the case where the gravitational mass is fixed in position and the photon of the rest mass E/c^2 is moving with velocity $(c-\mu)$

Hence the initial velocity of photon = $(c-\mu)$. It's velocity is towards the gravitational mass. The photon is having a freefall. Its final velocity = $-\mu + c - g_o t$ [where t is the time of flight of photon].

Initial Energy = $m(-\mu+c)^2/2 = E(-\mu+c)^2/2c^2 = E(\mu^2 + c^2 - 2\mu c)/2c^2$

Final Energy = $\frac{1}{2}(E/c^2)(-\mu + c - g_o t)^2 = \frac{1}{2}(E/c^2)(\mu^2 + c^2 + g_o^2 t^2 + 2\mu g_o t - 2c g_o t - 2\mu c)$

Change in Energy = $\frac{1}{2}(E/c^2)(g_o^2 t^2 + 2\mu g_o t - 2c g_o t)$, here $E = h\vartheta$ that means

Change in Energy = $\frac{1}{2}(h\vartheta/c^2)(g_o^2 t^2 + 2\mu g_o t - 2c g_o t)$

Hence change in Frequency = $\vartheta = 1/\{2(h/c^2)(g_o^2 t^2 + 2\mu g_o t - 2c g_o t)\}$ (33)

Here the frequency decreases. Incoming ray from a distant Galaxy will be Blue shifted.

Case3*. When the velocity of gravitational mass is not exactly opposite or exactly in the same direction to the incoming light ray:*

In this case the gravitational field will act as some brake or enhance the energy of the incoming light ray depending on $(\cos\phi)$ of the velocity of gravitational mass relative to incoming radiation, where (ϕ) is the angle between the light ray and velocity of gravitational mass .

The gravitating mass is moving with a velocity μ in the opposite direction and applies brake on the photon. This is something similar to the case where the gravitational mass is fixed in position and the photon of the rest mass E/c^2 is moving with velocity $\mu\cos\phi + c$

Hence the initial velocity of photon = $-\mu\cos\phi - c$. It's velocity is towards the gravitational mass. The photon is having a freefall. Its final velocity = $-\mu - c - g_o t$ [where t is the time of flight of photon].

Initial Energy = $m(\mu\cos\phi + c)^2/2 = E(\mu\cos\phi + c)^2/2c^2 = E(\mu^2\cos^2\phi + c^2 + 2\mu\cos\phi\, c)/2c^2$

Final Energy = $\frac{1}{2}(E/c^2)(-\mu\cos\phi - c - g_o t)^2 = \frac{1}{2}(E/c^2)(\mu^2\cos^2\phi + c^2 + g_o^2 t^2 + 2\mu\cos\phi\, g_o t + 2c g_o t + 2\mu\cos\phi\, c)$

Change in Energy = $\frac{1}{2}\,(E / c^2)\,(g_o^2 t^2 + 2\mu \,\text{Cos}\,\phi\, g_o t + 2c g_o t)$, here $E = h\,\vartheta$ that means

Change in Energy = $\frac{1}{2}\,(h\,\vartheta / c^2)\,(g_o^2 t^2 + 2\mu \,\text{Cos}\,\phi\, g_o t + 2c g_o t)$

Hence change in Frequency = $\vartheta = 1/\{2\,(h / c^2)\,(g_o^2 t^2 + 2\mu \,\text{Cos}\,\phi\, g_o t + 2c g_o t)\}$ (34)

Here it can be observed that equation 34 is the main equation and the equation 32 and 33 are special cases of equation 34. It will become equation 32 when ϕ is '0 degrees' and equation 33 when ϕ is 180 degrees.

6. Discussion:

The view that the energy photons that are radiated from stars as a by product of the fusion of light elements such as hydrogen into helium would be changed back into more matter (presumably hydrogen) as it passes near large masses is an important one. This way the hydrogen; that is consumed in the universe will be remade and new stars will form says Dynamic Universe Model. This concept is different from Bigbang as it says all the hydrogen is produced at the time Bigbang, once it is consumed the star will die and similarly all the stars and the Universe will die out eventually.

To explain in other words, here the fusion of 2 hydrogen atoms into a helium atom occurs in a star, most of the mass or matter that was originally in the hydrogen atoms remains in the star in that helium atom. The helium atoms that are produced in that way can also fuse into heavier atoms and this process can continue up to iron. Iron and the atoms that are heavier than that are too close to the center of periodic table, the most stable point in the atomic scale to be able to fuse because it would actually take the addition of more energy to cause them to fuse than would be freed in the fusion reaction. When all of the lower elements have been fused, the end result is that most of the matter that was in those lighter elements, is now stored in the new midrange atoms that have been produced. The matter will be formed from energy only it is not from nothing. No matter will be formed from nothing in Dynamic Universe Model; the energy will change its form from one state to another only. The fusion and fission reactions will happen according to Atomic physics.

In my earlier paper I discussed how the Universe converts the energy to sub atomic particles. In this paper we will discuss the conversion particles into of hydrogen. But I still have not calculated whether that amount of hydrogen was equal to the amount hydrogen fuel burnt in the stars. But I feel that should be the case. Here what is happening is when all the stars die out, the whole Galaxy will quench. New Galaxies bourn some other place. I showed all the evidences regarding this in the paper titled "Distances, Locations, Ages and Reproduction of Galaxies in our Dynamic Universe" [22]. The Stars, Novae and Super Novae will convert all of the original hydrogen plus all of the newly produced midrange atoms that were produced by the fusion process. Some of the midrange elements and their compounds will be hosted by Planets, Comets, asteroids etc. So that there will **NOT BE ANY OVERALL INCREASE** in the total amount of matter in the universe. The Universe is not created from nothing. It sustains the matter and energy balance.

This is a nonexpanding universe model and matter need not be created to keep the density constant. Our Universe converts energy into matter and matter will be converted to energy in a cycle. The Universe can be expanding or contracting depends on the overall status of the dynamical forces that are moving different bodies in different ways. Each body movement will depend on UGF (Universal Gravitational Force) acting on it at that moment at that position, which changes dynamically.

Another observation, in this nonexpanding universe the continual increase in the amount of matter that would be created in the form of these newly created midrange atoms would NOT continually increase the matter density of the universe. All this newly created matter which was filling up in some of the empty space, will be forming stars, or attracted towards some stars or planets. If no star or planet was nearby, this new matter will become inter-stellar or inter Galaxy clouds. And hence with this matter and the functioning of the universe would NEVER likely break down AT ANY time. And overall energy and matter balance will remain same.

Here we derived the equations using general Physics and Mathematics that changes the frequency of electromagnetic radiation passing near a moving gravitating mass. Using these equations we can clearly see that the light from distant Galaxy when passes grazingly near a gravitating mass like Sun the incident frequency of the radiation will increase (Red shifted) when the relative movement of the gravitating body is in opposite direction to EM radiation and the frequency will reduce when the relative movement of the body is in same direction (Blue shifted).

7. Conclusion

The particles prepared in the process of energy conversion accumulate in the Magellanic Clouds or the star forming clouds or the dust regions of star forming Galaxies. If all the stars are formed during Bigbang why stars are formed again in a Galaxy?

The **Elementary particles** generated in frequency changing process. Here and we have shown that all the elements are being prepared., **By Cosmic rays, By Small stars, By Large Stars, By Super Novae and Manmade elements By Neutron Stars.**

Dynamic Universe model is based on hard observed facts and gives many verifiable facts. Even though the frequency shifting as described here was not a physically observed fact, the earlier [22] paper gives possible outcome viz., blue and red shifting.

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This paper is available at the links
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