

Birth of Supermassive Black holes and Star Formation after the Big Bang

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Modern observations of star formation in different galaxies contradicts with the current star formation theories. There are few questions and observations where current star formation theories were not able to explain well. This paper proposes an alternative theory of Star formation and birth of Supermassive Black holes after the Big Bang, which can answer the contradictions without violating the physics laws and fit perfectly well with the modern observations.

Keywords

Big Bang – Supermassive Black holes – Star Formation – Expanding Galaxy

I. Introduction

Current theories proposes that “Star formation is the process by which dense regions within molecular clouds in interstellar space collapse into spheres of plasma to form stars”. These molecular clouds were mainly made of hydrogen and helium, gravity plays important role to fuse the hydrogen atoms into helium atoms at its core. Stars are powered by this nuclear fusion where the missing mass in the fusion were transformed into pure energy.

This paper proposes an alternative theory “Fission model of the Universe” as follows, The cosmic egg that created Big Bang was extremely dense but it wasn't extremely small. Since everything in the known Universe came out from the cosmic egg there is no way to fix the cosmic egg's size. The explosion of the cosmic egg which we refer as Big Bang not only created particles it also created some big pieces. Supermassive black holes at the center of the galaxies are the product of Big Bang, they are the direct broken pieces of the cosmic egg. These dense big and small pieces turned on nuclear fission on it's surface which eventually became the early stars of the Universe. All stars are powered by nuclear fission, their dense core is the fuel for the fission process. Collision of these massive stars and Supernovae created further stars.

The modern observations of the galaxies, stars and the laws of physics raises following questions to current star formation and galaxy evolution theory (Fusion Model). (i) What causes the stars flat rotational curves in spiral galaxies? (ii) Possibilities of molecular cloud formations and Nuclear fusion in low dense space (iii) How could Supermassive black holes evolved so soon after Big Bang (iv) Young star formation near supermassive black holes. The proposed Nuclear fission model theory in this paper clears all doubts about the star formation in the Universe.

II. Age of the Universe and Distant Quasars

According to the Big Bang theory Big Bang occurred approximately 13.798 ± 0.037 billion years ago, which is thus considered the age of the universe.^{1 2 3} The most distant stars that we observed are again comes close to approximately 13.5 billion light years away.^{4 5 6 7} The recent discovery of a distant galaxy “HFLS3” is estimated to be formed 880 million years after the Big Bang or at 6.5% of the Universe’s current age. Star formation on this galaxy is more than 2000 times faster than our own Milky Way.⁸ This observation breaks the rules of our current galaxy and star formation theories predicted. Now we observed these galaxies 13 billion years after its light left from it's source, it does not mean that these galaxies were not existed before that time. Comparing the distance with the mass of the galaxy shows that it must have been evolved before 13.5 billion years ago. The distant light sources that we observed are called Quasar (quasi-stellar radio source). Quasar is a very energetic and distant active galactic nucleus, they are extremely luminous. Quasars are believed to be powered by accretion of material into supermassive black holes in the nuclei of distant galaxies. These early Supermassive black holes and Quasars are one of the good evidence to prove that Big Bang not only created particles but also some massive pieces.

III. Expanding Spiral galaxies

The image of spiral galaxies and its spiral wings proves that the Supermassive black hole must have formed before the galaxy. The following possibilities can explain the wing formation in a spiral galaxy.

- (i) The stars in the spiral wings are formed in the middle of the galaxy and moving away from the center. In this case the center of the galaxy (supermassive black hole) must have formed in the first place. The high mass concentration in the center supports this possibility.
- (ii) The stars in the spiral wings are formed elsewhere, they were captured by the Supermassive black hole's gravity and moving towards the center of galaxy. The stars "flat rotational curve"^{9 10 11} in the galaxies disproves this possibility.

However the spin direction of the supermassive black hole at the center and the orbiting stars spinning direction is one of the important evidence to prove where the star formation began. By analyzing the spin directions, spiral wings and the "flat rotational curve" of stars orbit in galaxies we can say that spiral galaxies are expanding.¹² As per the "flat rotational curve" stars in the outer arms are moving away from the galaxy center much faster than the stars in the inner arms. The spiral image of the galaxy is the exact proof that the galaxy is expanding. Some kind of eruption at the spinning center must have caused this spiral shape. This can be experimented by studying a collision on a spinning body or a spinning water sprayer. These expanding spiral galaxies are the clear proof that the stars must have began their journey at the center of the galaxy where supermassive black hole resides.

IV. Reverse Lookup

It is believed that planets, moons, asteroids and comets were made of star dusts (remnant of supernovae). Let us lookup the formation of these objects in reverse order i.e. From the small objects to the big ones. Asteroids, Comets and meteoroid can not form alone by colliding small gas clouds these objects must have been created by some impact or collision on big bodies, Similarly moons can not form on their own by gravitational collapse. Moons can not form by joining too many asteroids by gravity, it requires high energy to melt all of them to become a single body, pressure and friction alone can not provide such high temperature. This proves that moons must be formed by melted debris ejected by some collision of big bodies. Unlike moon, asteroid and comets planets have strong core which can produce strong gravity, planets core can produce much heat on its own. The dense strong core required to form a planet proves that planets can not form by collapsing gas clouds, it requires some kind of collision or explosion of a massive body. We have witnessed star formation in stellar nebulas (remnants of novae or supernovae), this shows that small stars are forming from the remnants left over from massive stars. Looking at the complete order from a tiny meteoroid to a small star was born from something bigger than that. Though planets and stars can grow by capturing nearby objects by gravity we could see a clear pattern emerges from the order formations. This pattern alone may not be enough to prove the evaluation of galaxies and star formation but it could provide further clue or evidence. According to this reverse lookup order (i) massive stars must have been born out of something which is more massive than the star, which in terms black holes and supermassive black holes (massive objects in our Universe). (ii) Then Black holes and Supermassive black holes must have been born something extremely massive, that is our Cosmic egg which went as Big Bang. This may raise the following question "How did the Cosmic egg form?" for the purpose of this paper birth of the Cosmic egg is not explained here.

V. Density and Heat

The density in space is extremely low, water turns into gas even in very low temperature due to low density. Human blood boiling effect crossing the Armstrong limit or Armstrong's line is well known phenomena in space travel. If this is the case for water what would happen if we keep hydrogen in space? Naturally hydrogen atoms tend to repel each other, in this case it will expand much faster than water. If Big Bang created only particles, considering the high velocity of the particles and low density in space it gives no possibilities to the formation of gas clouds in this expanding Universe. Matter tends to expand when heated, when the temperature starts to increase in the gas cloud naturally it has to expand.

Nuclear fusion at the core of a star will create extremely high-temperature and high outward pressure this will push the hydrogen outwards makes no room for further fusion. Computer simulations of galaxy formations and star formations failed due to low mass, they can not explain this with out dark matter which accounts for more gravitational attraction. This proves that molecular clouds can not collapse on their own wait to ignite the nuclear fusion since there is not enough gravity.

VI. Molecular Clouds and Expanding Universe

Gravitational collapse of molecular clouds ignites the nuclear fusion (star formation) and scientists answer for the question where did the molecular clouds (hydrogen/helium) came from is, the temperature of the early universe after the big bang was to high, slowly the temperature went down allowing the particles to cool down and form the hydrogen atoms. This raises following questions,

- Do we have any evidence that prove Big Bang created only particles?
- It has been proved by experiment that atoms are made of particles, but can we create or experimentally prove by putting particles together to form an atom? It is very difficult to explain that after the Big Bang particles came close to form atoms since the particles must be traveling at very high speed in different directions.

It has been proved that our Universe is still expanding even after 13 billions years of Big Bang, Considering the massive amount of matter (Cosmic egg) exploding into particles must be extraordinary. This explosion must push the particles away from each other at very high speed and increasing the space between particles, giving no chance for particles to come close to form gas clouds. The early expanding Universe gives no room to think that only particles were created during the Big Bang. Cosmic egg broken into pieces explains well that distance galaxies moving apart due to Big Bang.

VII. Nuclear Fusion or Fission

As per the current theories, Molecular clouds collapse on its own wait triggers nuclear fission at the core of a star. This raises following questions:

- How did the gas clouds stars spinning? Since in a spinning gas cloud the atoms in the gas mostly travel in the same direction based on one center point, so what is the possibility of collusion? more over the velocity will be high on the outer edges going in the center the velocity decreases. This fact significantly reduces the possibilities of collision at high velocity.
- Considering the stars globe shape and energy released from a star, does the fusion happens in a even rate at it's core? Won't this inside out burning mechanism blow the star apart?
- Producing heavy elements through nuclear fusion requires more energy, then why heavy elements are only produced at the end of the stars life? When the star is running out of fuel.
- Heavy elements were found in supernovae remanent, then why nuclear fission is not possible in stars?

Matter expands when heated makes more room to think the possibilities of nuclear fission in a star. It is also possible that heavier elements become lighter elements by nuclear fission, the missing mass can be transformed to energy. (Example: A helium atom may lose some of its mass to become a hydrogen atom).

Temperature may play an important role to initiate the nuclear fission or fusion process. When the temperature was high matter enters into plasma state, this is what happens inside stars. Electrons ripped away from their nuclei in plasma state. Similarly matter behaves differently when the temperature reaches close to absolute zero, here comes Superfluid state and Bose–Einstein condensate (BEC) states.^{13 14} In a BEC, matter stops behaving as independent particles, and collapses into a single quantum state. Considering this temperature facts on matter it is possible that “by nature” nuclear fission happens at high temperature and nuclear fusion happen at low temperature.

VIII. Radio active decay

The Earth's internal core temperature is same as Sun's surface temperature, the heat comes from a combination of residual heat from planetary accretion (about 20%) and heat produced through radioactive decay (80%).^{15 16 17} Jupiter and Saturn receive less heat from the Sun compared with Earth but their temperature also increases when descending towards the core. Since Jupiter and Saturn are gas giants and lack for solid surface they must have lost their much of their internal heat, but their core temperature reaches extreme. Saturn radiates more than twice as much heat into space as it receives from the sun. Considering these facts we can say that the core is acting like a little star inside the planets.

Uranium is used as a fission fuel in nuclear power plant, the used fuel (Uranium) was kept in water pools for few years to cool down. This process reduces the radiation impact of the nuclear waste, the pool water recycled regularly to maintain the temperature otherwise the water inside the pool will evaporate. If this is the case, let us imagine what would happen if we keep a Sun (our nearest star) size Uranium metal (or some unstable heavy metal, We need to note that metals may react differently when temperature or pressure changed) in space ? Or imagine increasing the Earth's core into the size of our Sun. Naturally it will become a star. This is what exactly happened to the broken pieces of cosmic egg (Big Bang).

IX. Star formation near to a Supermassive Black Holes

As per the current theory (Fusion Theory) stars can not form close to a black hole due to the high gravitational influence of the black hole. But according to this fission theory star birth near black hole is one of the important evidence to prove it is correct. Modern observations witnessed, the stars orbiting nearby our milky way galaxy's supermassive black hole are newly born stars,¹⁸ where it was thought to be star formation is not possible due the high gravitational influence of the black hole.

The density of black hole at the core becomes infinite and some of Supermassive black hole's density can be less than the density of water. However both may not be true, it is possible that our density calculations may be wrong since our technology can not predict the exact mass and volume of a distant black hole, but it must be significantly high. If two black holes collides what happens to the debris ejected by the large collision? We knew that black holes are massive and collide at very high speed due to high gravitational attraction, the massive dense debris will lead to the formation of new stars. The similar process happens in different scales on stellar nebulas, after a massive star went supernovae the remaining massive pieces of the star becomes small stars.

X. Conclusion

This paper proposes a fission model of the Universe, considering the following facts

1. Big Bang is a fission process.
2. Existence of supermassive black holes soon after Big Bang.
3. Supernovae is a fission process, where massive star explodes and gives birth for small stars.
4. Order of objects formation from big (stars) to small (meteoroid) in the Universe.
5. Young star formations near milky way's center supermassive black hole.
6. Expanding spiral galaxies shows that stars must have began their journey from the center of the supermassive black hole.
7. Low possibilities of nuclear fusion in extreme low density of the space and high possibility of nuclear fission.

As per the fission model all big objects in the Universe will slowly become small and small by various processes like nuclear fission, radioactive decay. What we refer as a star is a process of massive dense object slowly dissolving into the low dense space through nuclear fission.

XI. References

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