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How do the Black Hole and the Universe Form?

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Abstract--- *This article aims to attempt to clarify how the black hole and the universe form by finding root causes of formations of the black hole and the universe and put forward a new theoretical point of view based on related physical and chemical theories. When the black hole exploded under incredibly high temperatures, all liquid and solid substances exploding out of the black hole have been in gaseous phase besides original gases. Generally speaking, the farthest away from the sources of heat the gases arrive, the fastest they become cool. Adjacent gases gradually mass and form a gaseous lump under inter-atom gravitations between them when they cool down. When they become cooler and colder to a sufficiently low temperature, they will gradually form a star- or planet-like object. Similar cases happen to other stars, planets, asteroids, smaller objects, etc. The universe was born. When sources of heat (e.g., the Sun) burn themselves out sometime in the future, e.g., in several billions of years, they will no longer release heat and gradually cool down. With mutual attraction of stars and planets under atomic gravitations between them, colder and contracting stars and planets gradually move nearer one another, finally connect one another and gel altogether on the basis of the principle of expanding when heated and contracting when cooled in general cases. As the stars and planets become much colder, they will further fuse together and remarkably contract and gradually become a small object, which looks perhaps like a small eddy from afar, or a black hole.*

Keywords: Black Hole

I. INTRODUCTION

The idea of black hole was put forward by German astronomer Karl Schwarzchild in 1916 based on Albert Einstein's relativity theory (Rabounski, 2008, see also Banks et al., 1997) and the term black hole was coined by American physicist John Archibald Wheeler (Ford, and Wheeler, 2000). The cosmic explosion theory was suggested by Belgian mathematician, Catholic priest, astronomer and cosmologist Georges Lemaitre in 1927 (Midbon, 2000) and became dominant after revision by Soviet Union-American physicist George Gamow (Chernin, 1995). The debate on the origin of black hole entropy has been lasting since a very long time (Cvetković and Simić, 2018). NASA (2017) noted that "A black hole is a place in space where gravity pulls so much that even light can not get out. The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying." Ellis (2013) argues that "the effect of Hawking radiation on an astrophysical black hole situated in a realistic cosmological context is not total evaporation of the black hole; rather there will always be a remnant mass." "In 1974, Hawking calculated that, owing to quantum effects, black holes are not entirely black: some particles escape the black hole's gravitational barrier, known as the event horizon. For a solar-mass black hole, these particles, known as Hawking radiation, would be emitted over the course of 1067 years until the object vanished without a trace (S. W. Hawking Nature 248, 30–31; 1974)."(See Cowen, 2013).

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"Cosmologists have speculated that the Universe formed from the debris ejected when a four-dimensional star collapsed into a black hole — a scenario that would help to explain why the cosmos seems to be so uniform in all directions." (Merali, 2013). "the very early Universe underwent an accelerated expansion, or cosmic inflation, and the possibility that the observed Universe was produced by a quantum-tunnelling event (perhaps tunnelling out of a lab)"(Merali, 2017). The above debates indicate that the black hole and the universe form remain required for further research because root causes of formations of black hole and the universe seemed lack. This article aims to attempt to clarify how the black hole and the universe formed by finding root causes of black hole and cosmic formations and try to provide new explanations or put forward a new theoretical point of view based on related physical and chemical theories including atomic movement theories, gravitation theories, solid-liquid-gas phase boundaries theories, the principle of expanding when heated and contracting when cooled in general cases and the law of conservation of energy.

In this article it is suggested that the universe consists of many small universes of different sizes, which are subsequently born with explosions of many small black holes of different sizes forming at different time without excluding the formation or explosions of two or more at a similar or the same time. Each small universe experiences a process of formation, development and death and repeats the process countless times. Time for the formation and death of each small universe is different, but it is not excluded that the time for the formation or/and death of the two or some more of small universes is possibly similar, or even the same. Besides, it is also possible that after the death of a small universe, a bigger or smaller black hole forms and subsequently explodes and generates a larger or smaller small universe.

When it explodes, the black hole is being in an incredibly hot state. Hawking (1974) noted that "it seems that any black hole will create and emit particles such as neutrinos or photons at just the rate that one would expect if the black hole was a body with a temperature of $(\kappa/2\pi)$ $(\hbar/2k)$ $\approx 10^{-6}$ $(M\odot/M)K$ where κ is the surface gravity of the black hole[1]." The study suggested that the temperature for black hole explosion is very, very high. In this case, all types of substances from the black hole have been in gaseous phase. More exactly, all liquid and solid substances exploding out of the black hole have turned into gases under enormously high temperature and pressure. With the explosion and the subsequent release of calories, the gases which would be turned into from liquid and solid substances (e.g., metals, rocks, etc.) and original gases spew out and spread to all over the small universe, which was just born. Generally speaking, the farthest away from the sources of heat (e.g., the black hole, the Sun) the gases arrive, the fastest they become cool. The atoms which these gases consist of interact and attract one another under inter-atom gravitations. As such, adjacent gases gradually mass and form a gaseous lump when they cool down. When they become cooler and colder to a sufficiently low temperature, they will gradually form a star- or planet-like object. The compositions of the star- or planet-shaped object depend on the compositions of the gaseous lump which is massed adjacent gases exploding out of the black hole with interaction and mutual attraction of atoms of the gases under the inter-atom gravitation. Perhaps the star- or planet-shaped object has compositions which are the same as those of the Sun. As such, it can make nuclear fusion and give out light and heat like the Sun. A Sun is born. Perhaps it has compositions which are the same as those of Jupiter, Saturn, Uranus or Neptune, or the earth or the moon, etc. A corresponding planet or star is born. A large number of gaseous lumps with different compositions and sizes which gradually form at different locations after the explosion of the black hole further cool off to become stars and

planets with different properties, asteroids and smaller and tiny objects and other substances. Thus, a universe forms with the explosion of a black hole.

As one of vital planets in the universe, similarly, at first the earth was a gaseous planet composed of gases, which would be turned into from metals, rocks and other solid substances and liquids, and original gases after the black hole exploded. Contrasted with other stars and planets closer to sources of heat, the much farther away from sources of heat (black hole, the Sun, etc.) the earth lied, the faster it cooled off. Perhaps its compositions also made it become cool more quickly. When it became much cooler than when the black hole exploded, a great deal of gases in the gaseous earth was changed into liquid (e.g., some rocks and metals) and some into solid phases (e.g., some other metals) on the basis of boiling and freezing points of all types of substances. Some of these liquids continued to be turned into solid states with a sufficient drop in temperature. When the temperature dropped the far below zero degree centigrade, there were much more lands and ices on the surface of the earlier earth during a very long period of time than nowadays. When it became cooler and colder faster than many other stars and planets with other sizes and compositions closer to sources of heat, the earth gradually moved to the third orbit of the solar system from where it was situated some farther away from the Sun, with the increase of its weight and gravitation. It is inferred that a large number of small and tiny objects and substances, etc. around the earth were subsequently attracted onto the earth under the gravitation of the earth and thus gradually increased the weight and gravitation of the earth to a sufficiently big extent for it to leave its beginning location for the third orbit of the Sun. While the Sun shined over the earth, the surface of the earth became warm. Some ice started to melt into liquids. We saw the rise of the sea level, which could date back to when the earth moved to the third orbit of the solar system and started to be shined by the Sun and somewhere of the surface of the earth attained a sufficiently hot temperature or the melting point. In the past two or three hundreds of years, climate warming that the sharp increase of population and industrial revolution brought accelerated the rise of the sea level in particular. We see the Arctic and the Antarctic covered with snow and ice. In the early period of the birth of the earth, when the surface of the earth cooled down to far below freezing point, more parts of the sea and land we see nowadays may be also filled with or covered with thick ice and snow. That is to say that for a very long time there had once been much more lands and snow and ice and much less sea, river and lake surfaces on the earth than those we see today. However, it is also very likely that the massed gaseous lump of the earth exploded from the black hole directly arrived in the third orbit in the solar system rather than after a great movement. If the massed gaseous lump of the earth directly arrived in the orbit of the solar system, but could not get enough quantity of heat released by the Sun to keep the gaseous lump always in a gas state, the gaseous lump would gradually cool off. Some of gases were turned into liquid state and keep it in a liquid state. Others were changed into liquid state and subsequently into solid state when the quantity of heat from the Sun was not enough to maintain the liquids in a liquid state. In either of the above two cases, amounts of substances in solid, liquid or gaseous phases varied to different extents with remarkable change of temperatures.

In several hundreds millions of years or several billions of years, due to the persistent shining of the Sun on the earth year in year out, the ice and snow on the earth will continue melting, turn into water and flow into the sea, river or lake. The sea, river, and lake waters will continue gradually steaming little by little until the bottoms of all the sea, river and lake become dry. At that time the earth will become much lighter and its gravitation will have been enormously reduced. Gradually it will drift away from the Sun and become colder. It is inferred that the case would happen as the Sun lives much longer than the earth. Sometime in the future, e.g., in several billions of years, when the Sun burn itself out, the heat from it will gradually decrease until it completely cools down. If the heat which the Sun releases is not enough to turn the other

planets (e.g., earth, moon) in the solar system into gases before the Sun cools off, it will gradually spread to other places outside the solar system, e.g., all the Galaxy except the solar system, or even other small universes on the basis of the law of conservation of energy. All planets in the solar system will become colder and colder and start to contract based on the principle of expanding when heated and contracting when cooled in general cases. With interaction and mutual attraction of the planets under atomic gravitations between them, the colder and contracting planets will gradually move nearer one another, finally connect one another and gel altogether. As the planets become much colder, they will further fuse together and remarkably contract and gradually become a small object, which looks perhaps like a small eddy from afar, or a black hole. That is a process of black hole formation. If similar cases happen to the other planets and stars in the universe, all these other planets, starts, other small and tiny objects and visible and invisible substances in the universe will fuse together and further contract into one bigger object than that in the solar system, one bigger black hole, or perhaps fuse respectively and contract into several small objects with different or similar sizes, several small black holes. That depends on whether the gravitations between small black holes are big enough to enable them to fuse together and become one big black hole before one or a few small black holes explode into one or subsequently a few small universes. That is to say that when a bigger universe is destroyed, it can turn into several small black holes, or one bigger or smaller black hole, which rely on whether it increases or lose substances when it interacts with other small universes. In the new black hole an extremely enormous quantity of all types of flammable or non-flammable substances mix together and the atoms which all the substances are composed of constantly move, that results in mutual frictions and collisions and generate heat. When the friction, collision and heat become more and more to a sufficiently high extent, the new black hole explodes and a new universe is born. Perhaps a new Sun, and a new earth, which are similar to or different from the Sun and the earth that we see today, and new planets and stars appear. The process of black hole formation and explosion or universe explosion and formation will be constantly repeated countless times.

A black hole explodes after it has massed a sufficiently great number of stars, planets, small and tiny objects and visible and invisible substances under the same or similar conditions as those above-mentioned. That is to say that when it does not necessarily gather together all planets, stars and visible and invisible substances from the whole universe, a black hole can explode under the same or similar condition, which means that there is not only one black hole in the universe, and subsequently not only one universe forms. As we know, hydrogen gas explodes after the quantity and dense of hydrogen gas attain to a sufficiently high extent under a certain condition. However, it is not necessary to mass all hydrogen gas from the whole universe for causing it to explode. That means that when different volumes of hydrogen gas attains to at least an enough dense and amount under a certain condition, it can explode. Similarly, as black holes with different sizes masses planets, stars, small and tiny objects and substances to at least an enough dense and amount under a certain condition, they can explode. Because the compositions and amount of substances which each black hole contains are not completely same or greatly different, the size of each black hole which can result in explosion is different. Thus, there is a big or small difference in the size of each black hole. Each black hole explodes and generates one universe. Subsequently, there is also a big or small difference in the size of each universe.

As far as the location relationships among universes are concerned, two universes chosen arbitrarily from among numerous universes are parallel, or partly overlapped or neither parallel nor overlapped. All those possibilities for location relationships among universes can exist simultaneously among universes because the size and location of each black hole which generates explosions are unknown and the size and location of each universe are unknown either. All those possibilities cannot be excluded.

As regards the shape of the universe, its accurate shape is difficult to be predicted unless someday in the future humans would have invented or created certain technologies so that the whole universe would be able to be photographed or seen with their eyes through the cosmic model they would have produced. The universe is dynamic. At present it is expanding and sometime in the future it will start to contract. Each shape of the universe is one shape at that moment. However, on the whole it is inferred that it is a solid. What type of solid is it? Is it a sphere, cylinder, cube or a hybrid with one or two or more solids? All substances from the cosmic explosion just like those from the boiler explosion happen neither to form a circle, ring, sphere, or cylinder nor to be on the same horizontal plane. It must be most likely to be an irregular solid.

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References

[1]. Albrecht, A. (2017). Physics: A Cosmos in the LAB. Andreas Albrecht ponders a study of the physicists who grapple with the origins of the Universe. *Nature* Volume 52, 164

[2]. Banks, T., Fischler, W., Klebanov, I. R., Susskind, L. (1997). Schwarzchild Black Holes in Matrix Theory II. *High Energy Physics – Theory*, v2. 10.1088/1126-6708/1998/01/008

[3]. Chernin, A. D. (1995). George Gamow and the Big Bang. *Space Science Reviews*, 74, 447-454.

[4]. Cowen, R. (2013). Black holes shrink but endure. *Nature* Volume 502, pages 603-604.

[5]. Cvetković, B. and Simić, D. (2018). Near horizon OTT black hole asymptotic symmetries and soft hair. *General Relativity and Quantum Cosmology* (gr-qc). arXiv:1804.00484 [hep-th]

[6]. Ellis, G. F. R. (2013). Astrophysical black holes may radiate, but they do not evaporate. *General Relativity and Quantum Cosmology*, V2.

[7]. Ford, K. W. and Wheeler, J. A. (2000, Revised ed. edition). *Geons, Black Holes, and Quantum Foam: A Life in Physics*. New York: W. W. Norton & Company.

[8]. Hawking, S. W. (1974). Black hole explosions? *Nature* Volume 248, pages 30-31.

[9]. Merali, Z. (2013). Did a hyper-black hole spawn the Universe? *Nature* News and Comment, Sept. 13

[10]. Midbon, M. (2000). A Day Without Yesterday: Georges Lemaitre & the Big Bang. *Commonweal Magazine* Vol. 127, No. 6, 18-19.

[11]. NASA (2017). What is a Black Hole? March 8, 2017. USA: *NASA*.

[12]. Rabounski, D. (2008). Biography of Karl Schwarzschild (1873–1916). *The Abraham Zelmanov Journal* (The journal for General Relativity, gravitation and cosmology), Vol. 1, xiv-xix.