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BLACK HOLE (A REVIEW)

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ABSTRACT

In this paper we present the formation of black hole and general detail on black hole. A black hole is a place where gravity has gotten so strong that the escape velocity is faster than light. Einstein's general theory of relativity predicts that gravity should appears in its purest form in two ways; In vibration of space time called gravitational waves and in dens knots of curved space time. The true black hole revolution occurred only with Einstein theory of general relativity in 1915. There is no limit to the size of a black hole. It can be as heavy as few billions suns. According to the general relativity, now rotating black hole must be very simple, their size depends on their mass and any two such black holes with the same mass were identical.

INTRODUCTION

The term "Black Hole" was coined in 1967 by American physicist "John Arichbaid Wheeler". In 1916 "karl Schwarzschild" has proved that black hole work as a solution to Einstein's equation in spherical symmetary. Schwarzschild's solution is for a non-rotating black hole and in 1963 the new zeland mathematician "Ray Kerr" found the theoretical solution of rotating black hole [10 times the mass of the sum] would have a radius of 30 km and a super massive black hole would have a radius of 3 million kms. A black hole bends space and time so tremendously that time stops at its horizon's edge and neither matter nor energy can escape from within the horizon. It is a great amount of matter packed into very small area like start 10 times more massive than sum, no even light can escape. When a black hole and a star close together high energy light is made this kind of light can not be seen with human eyes scientist use satellites and telescope in space to see the high energy light.

How do Black hole form [formation of Black hole]:- The formation and growth of super massive black hole is a subject to intense discussion this indicate the universe was 200-400 million years old it was inhabited by stars brighter, hotter and more massive than the next generation. This first generation of stars, usually called population III Black hole are formed from collapse of gravitation matter. The most common way for a black hole to is probably in a supernova, an exploding star. When 4 stars with about 25 times the mass of the sum end its life It explodes the inner part of the star, its core collapses down. The gravity of the collapsing core will compress it so much that it can become a black hole.

How can we find the black hole:- The super massive black hole found in the center of galaxies. Once you pass the point where the escape velocity is faster than light you can't get out and this region is called as event horizon. Black hole are so good at emitting x-ray that many thousand can be spotted this way. Exist is one of the space craft designed to be able to detect tens of thousands of black hole. Some of which may be billions of light years away. Astronomer conclude that the total mass of the inner region of a galaxy is proportional to the mass of its central black hole. Black hole also represent the ultimate end point of matter

Black Hole Theory:- The existence of black hole has been theorised for more than 200 years. Black hole a few times more massive than the sun can form at the ends of the lives of massive stars. In 1974 theoretical physicist "Stephen hawking" considered quantum effect and discovered that quantum black hole. They emit thermal radiation in a theoretical way only three parameter are sufficient to characterise black hole.

1. Mass
2. Angular
3. Electric charge

Stephen hawking pointed out that if, quantum effect are taken into account, they can radiate thermal energy and particle. This hawking radiation carries energy away from the black hole and reduce its mass ($E=MC^2$). Therefore a black hole shrinks until its evaparates.

The lightest black hole are called elementary black hole. The most powerful outflows of energy in the universe are not carried by light but by gravitational waves emitted two black holes orbit, collide and merge. In the final minutes or hour before the merging of a single pair of supermassive black hole, a gravitational power of about 10^{52} watts is radiated. This is a million time more power than all the light from all the stars in all the galaxies in the visible

universe put together and millions of times more powerful than the most powerful single source of light gamma-ray burst. It is possible that the universe contain more of this gravitational radiation than it does light.

In Einstein theory of gravity, energy can also be carried by vibrating waves of space and time, which travel at the speed of light. In the same way that black hole are made just to space and time, gravitational waves are also “pure” space and time. They interact very weakly with matter and penetrate anything without losing strength. While this makes them powerful probes of extreme condition. It also make them hard to detect black hole of steller mass are expected to for when very massive stars collapse at the end of their life cycle. After a black hole formed, it can contineous to grow by absorbing other stars and merging with other black hole.

We believe that there are much larger object in the universe, like the central region of galaxies, that can also undergo gravitational collapse to produce black hole.

LISA {Laser Interferometer Space Anntena}:- LISA uses gravitational waves to sense directly the changes in space and times around black hole and to measure the structure of the universe and also offer on entirely new way to sense action in the universe. Through them we will hear for the first time the merges of giant black holes and the death spirals of stars they capture and swallow. Using these we will map the knotted structure of space and time around a black hole and determine it the astronishing prediction of Einstein’s theory are correct: the freezing of time and dragging of space around a black hole study of the Role of massive black hole in galaxy evolution through the delection of black hole merges. LISA will be able to observe for a year or more any merge of super massive black hole in merging galaxies essentially most of the visible universe with signal to noise ratio of over 1000. Did super massive black hole form by merge of smaller ones, were they massive when they first formed, or did they grow by eating their galaxies from the inside the Chandra X-ray observatiory has detected supermassive black hole out to z=5, long before most stars were formed. LISA and JWST (James Webh Space Telescope) will measure. The properties of even more distance black hole.

Black Hole Finder Probe:- The super massive black hole at the center of our milky way and its companion, the andromeda galaxy, and normally quiet, perhaps flaring brightly every 10 thousand years when they swallon a star from their surroundings. Even the three closest

supermassive black hole now swallowing gas are hidden in galaxies that otherwise appers normal. Yet these black hole have had, dramatic effect on the formation and evolution of galaxy and even life. The optical appearance of a galaxy usually does not advertise the presence of block hole.

Black hole finder probe will perform the first all sky imagineg census of accreating black hole for supermassive black hole in the nuclei of galaxies to intermediate mass (about 100-1000 solar mass) holes produced by the very fast stars, to stellar mass holes in our galaxy. The gamma –ray large area space telescope (GLAST) now in development, will see the most energetic region around black hole. The BH finder probe from beyond Einstein will take a census of nearby black hole these studies will help us pin down the role black hole have played in the development of galaxies

Cygnus X-1:- We also now have evidence for serval other black hole in system like Cygnus X-1 in our galaxy and in two neighbouring galaxies called the Magellanic Clouds. The number of black hole, however is almost certainly very much higher, in the history of the universe, many stars must have burned all their nuclear fuel and have had to collapse. The number of black holes may will be greater even then the number of visible stars, which totals about a hundred thousand million in our galaxy alone. The extra gravitational atteraction of such a large number of black hole could explain why our galaxy rotates at the rate it does the mass of the visible stars is insufficient to account for this, we also have some evidence that there is a much larger black hole with aa mass of about a hundred thousand times that of the sun, at the center of our galaxy.

CONCLUSION

Black hole is generally found at the canter of galaxies. If their size and shape depending only on their mass and rate of rotation. If, when the rotation is zero, then the black hole is perfectly round and if the rotation is non-zero, the black hole bulges outward near its equator and the faster it rotates, the more it bulges.

“Exactly 40 years after theoretical physicist Stephen hawking is now claiming that black hole did not actually exist “and he propose that there are “apparent horizon “ which suck in matter and energy . As our point of view black hole were exist because the only thing at the center of galaxy in which not even light can escape.

Time stops when you travel at the speed of light or when yor're at a black hole. When this happens, you wont't be able to see anything as even light photons will freeze and they won't hit your retina.

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