Intriguing Phenomenons Of Black Holes

Black Holes

What are black holes made of? Where do they lead to? These are some of the multiple questions that seem almost impossible to answer. There is also a handful more questions that probably cannot be solved in a lifetime and may not ever be solved. But some questions that can be answered are: what are black holes? What makes a black hole a black hole? How do they form? And where does everything go once inside a black hole?

First of all, to explain to the people don't even know black holes exist, let alone know what they're about. Black holes are regions in space that have a large gravitational pull(May) with an escape velocity, of the event horizon, that is equal to the speed of light(Unknown). This means that anything that isn't travelling faster than the speed of light in a black hole's vicinity would not be able to escape the grasp of it. The reason behind the strong gravitational pull is due to the extremely large mass that is contained in an infinitely small point called the singularity where all of the black hole's mass is believed to be stored(Kurzgesagt – In a Nutshell). There are also three types of black holes, primordial, stellar, and supermassive(May). Primordials are the smallest kind, but they are theoretical because none have been discovered. A primordial black hole would be as small as an atom and is thought to have only existed during the creation of the universe when matter was very dense. Stellar black holes are medium-sized black holes that can have a mass up to 20 times the mass of the sun and many of these can be found in the Milky Way galaxy. And finally is the supermassive category, which according to its name, is super massive. Supermassive black holes are the largest kind of black holes and they have a mass that is at least equal to one million suns. These kinds of black holes have been proven to reside in all large galaxies.

Other than the singularity that was mentioned previously, black holes are also made up of many other parts, including the event horizon, the accretion disk, jets of plasma, and an ergosphere for a few black holes. Firstly, is the black hole's event horizon. This is the point of no return for a black hole meaning that nothing can escape once inside it. Next, comes the accretion disk which is one of the ways that someone can determine that there is a black hole in a certain area. It is a disk of debris that has not quite fallen into the black hole and circulates it like a flat disc just like Saturn's rings. The jets of plasma, or astrophysical jets, are jets that shoot out of the black hole perpendicular to the accretion disk. The jets are thought to form because of the accretion disk, but it is still unknown as to why these jets are formed(Unknown). Some speculate that the accretion disk produces magnetic fields which collide, forming the jets. Finally is the ergosphere of a black hole. This part of the black hole is a drag of space-time because of a black hole's gravitational pull although it only occurs in spinning black holes.

In one sentence, a black hole is formed due to the collapse of a large star. Black holes are formed when a large star reaches the end of its life and it runs out of fuel to burn on. A star that would be large enough to produce a black hole would have to be at least five times larger than our sun. Normally, a star is kept alive by two opposing forces, radiations, which pushes outwards, and gravity, which pushes inwards(Kurzgesagt – In a Nutshell). The star has a high mass which produces the gravity and inside the star, hydrogen is being converted into helium as

fuel which creates radiation needed to keep a star from crushing itself. After a star as big as our sun were to run out of fuel, it would become something known as a white dwarf, which is a small and dense planet. But if a star five times larger than the sun were to run out of hydrogen, it would start burning the helium and then carbon, then neon, then silicon, and finally iron(Kurzgesagt – In a Nutshell) where the star wouldn't be able to use it as fuel anymore, causing the star to implode, thus creating a black hole.

Ever since black holes have been discovered, a question had been stumping many people. This question is "where does the matter that gets sucked into a black hole go?" Or more specifically, where does the matter from a black hole go after it evaporates after releasing Hawking radiation? Hawking radiation was discovered in 1974 by the one and only Stephen Hawking(Unknown). Hawking radiation is a type of thermal radiation that releases small particles and slowly decays a black hole until it disappears. Which brings up the issue of where matter or information goes after the evaporation. There have been many speculations but none of them have been proved correct, yet(Unknown).

Black holes are intriguing phenomenons that are created because of the death of a star. Many questions about black holes have been answered, but we still don't know a large majority of the answers we seek. Black holes are clearly dangerous and are almost impossible to study in person and the large majority of answers may never be solved due to this, well at least for however long we live for or even however long humans exist on planet earth.