**BLACK HOLES AND EINSTEIN’S SPECIAL RELATIVITY**

 Black hole is one of the most incredible phenomenon of nature and intrigued scientists and average people alike for decades. Everything in [space](https://kidsastronomy.com/the-universe/outer-space/) seems to be orbiting something. Moons orbit [planets](https://kidsastronomy.com/the-universe/planets-and-exoplanets/) and planets orbit [stars](https://kidsastronomy.com/the-universe/stars/). But what are all the stars circling around? The answer: extremely powerful objects called black holes. Black holes are regions of space that have such strong gravity, nothing can escape them. They just pull things close and then suck them in. What happens after, no one can say for sure.

How is a black hole formed? It all starts with a massive star. As the star fuses hydrogen into heavier elements (a process called [*thermonuclear fusion*](https://en.wikipedia.org/wiki/Thermonuclear_fusion)), the heat produced creates an outward pressure, which acts against the inward force from gravity. In essence, the thermal pressure prevents the star from collapsing under its own gravity, and as long as the star has fuel to fuse and create heat, the thermal pressure and gravity are in balance (called [*hydrostatic equilibrium*](https://en.wikipedia.org/wiki/Hydrostatic_equilibrium#Astrophysics)).

Now, the next thing to ponder about black holes is there presence. Although we cannot see black holes, we can detect or guess the presence of one by measuring its effects on objects around it. The following effects may be used:

* Mass estimates from objects orbiting a black hole or spiralling into the core
* Gravitational lens effects
* Emitted radiation

Black holes are really hard to get a density. Basically, they are so dense that there is no known mechanism for providing sufficient outward force to counterbalance the inward pull of gravity, so they will collapse into an infinitesimally small size. You know from Einstein’s equation E=MC^2 that energy is equivalent to mass. Hence, in particle accelerators ,we produce a lot of energy in a very small region which give rise to Micro Black Holes.

Time is just like a river. Also It flows at different speeds in different places, and that is the key to travelling into the future. This idea was first proposed by Albert Einstein. Time slows down near black hole for the object because of its speed . Since, Black holes are dead stars being clobbered together which enhance its gravitational force to such extent that even light could not escape it. So for the object to reside or tangent through it, object must maintain a speed equal to that of light in order to escape its pull up gravitational force .

Dark matter and dark energy are something that we are not pretty sure about what they actually are. We know that they are present out there but we cannot detect them or see them because they do not interact with light. **Dark matter** is composed of particles that do not absorb, reflect, or emit light, so they cannot be detected by observing electromagnetic radiation. It exists because of the effect it has on objects that we can observe directly.

**Dark energy** is the name given to the force that is believed to be making the universe larger or tending to accelerate the expansion of the Universe.