What is 'Black Hole'? How black holes are formed and discovered?

Black Hole:

"A region of space having a gravitational pull so intense that no matter or radiation can escape from it."

Supernova of a star more than about 10 times of the size of our sun may leave behind the densest objects in the universe - black hole.

Black Hole formation:

a) Massive stars:

Stars which are six times as massive as our sun are called Massive stars.

b) Collapse of Massive stars and formation of supergiant:

A massive star has short lifespan than the sun or other low-mass stars. Hydrogen in the core of a massive star is used up with fast speed. After only 50 to 100 million years, no hydrogen is left in the core of a massive star. Thus, core collapses and star become 1000 times greater then its original size - called supergiant

c) Supernova:

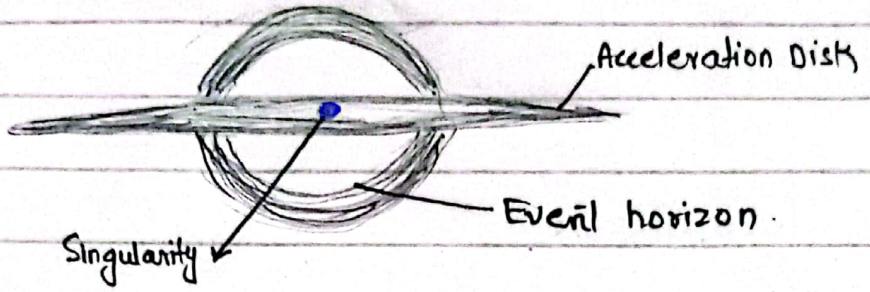
which the passage of time, the supergiant becomes so dense that it can not bear the pressure of outer layer. The outer layer crash inward with a tremendous explosion called supernova.

d) Formation of Neutron star:

At supernova, light of the star becomes much more than all other stars in the galaxy. great shell of gases fly off the star. Only tiny core of the star remains that contains only neutron - so called neutron stars.

e) Formation of Black Hole:

Neutron star is extremely dense. Sometimes after Supernova, star becomes blackhole - a dense part black hole is the last stage of the life of a massive star.



- Massive star (10x bigger than sun)
- Neuclear fuel Exhausted
- Supernova Explosion
- Core collapse due to gravity
- Formation of Black hole

How Black holes are discovered

Black holes are not visible because light can not come out of it. But Scientists can see how the strong gravity affects the stars and gas around the black hole

- Concentration of stars is greater in the center of galaxy
- Everything is revolving around
- It has an **Event horizon**; a point of no return, beyond which no light or other radiation can escape.

- **X-ray Emissions:** Matter falling into black hole heats up and emits X-rays, which can be detected by Space Telescope.
- "In 2019, the Event Horizon Telescope (EHT) captured the first-ever image of a black hole's shadow in galaxy M87."