Supermassive moving Black hole

March 18, 2021

In news : Recently, the Astronomers have discovered the **first moving supermassive black hole**

Key updates

- This Supermassive moving Black hole's mass is about three million times that of our Sun.
- Researchers and the Center for Astrophysics | Harvard & Smithsonian have identified the clearest example yet of a black hole in motion, publishing their findings in The Astrophysical Journal
- According to the Astrophysical Journal, the black hole was travelling within its own galaxy, J0437+2456, which is around 228 million light years away from Earth
- **Theory to practical:** Researchers said that spotting a black hole in motion was surprising even though the phenomenon always existed in theory, because the majority of supermassive black holes are not expected to be moving; they're usually content to just sit around
- The enormous size of these black holes had led people to imagine them to be stationary objects planted in the middle of galaxies as opposed to objects floating around in space.
- The recent discovery of a moving blckhole is the result of five years of study. hey had set out with the question, "Are velocities of black holes same as that of the galaxies they reside in?"
- **The focus of their study was** the water in the accretion disk the spiralling mass around a supermassive black hole made of matter that is eventually ingested by the black hole.
- As the water circles around the black hole before

falling into it like liquid in a sink, “it produces a laser-like beam of radio light known as a maser”. These masers can tell the velocity of black holes very accurately.

How did scientists discover it?

- Scientists used radio antennas placed at great distances from each other to form a giant reception net for masers emitting from the roving black hole.
- By using a technique called very long baseline interferometry (VLBI) they calculated the velocities of the 10 black holes under survey.
- Only one, whose velocities didn’t match with the other objects in the host galaxy, stood out.
- The study noted that the supermassive black hole is moving with a speed of about 110,000 miles per hour (177,027.84 kilometre per hour) inside the galaxy J0437+2456.

What are the reasons for its motion?

Though the scientists are not sure what is causing this motion, they have narrowed down on two possibilities: **Two black holes merging and a binary system of blackholes.**

- The scientists said that they might have spotted the resulting black hole moving in a rearward motion after the merger before settling down in a position.
- The second, more exciting theory is that of a binary black hole system where not one but two supermassive black holes might exist within the host galaxy held together by a shared centre of gravity, which they might be orbiting.

They also pointed out that the twin of the newly-discovered wandering black hole might not be emitting masers, keeping it from being detected by the radio antenna network.

What are blackholes?

- A black hole is a space where gravity pulls so much that even light is unable to come out. The gravity is so strong due to the squeezing of matter into a small space.
- A black hole is an object with an escape velocity greater than the speed of light – escape velocity is the speed required to escape from its gravitational grip.
- Because no light can escape, black holes are invisible