Galaxy 2

Black hole

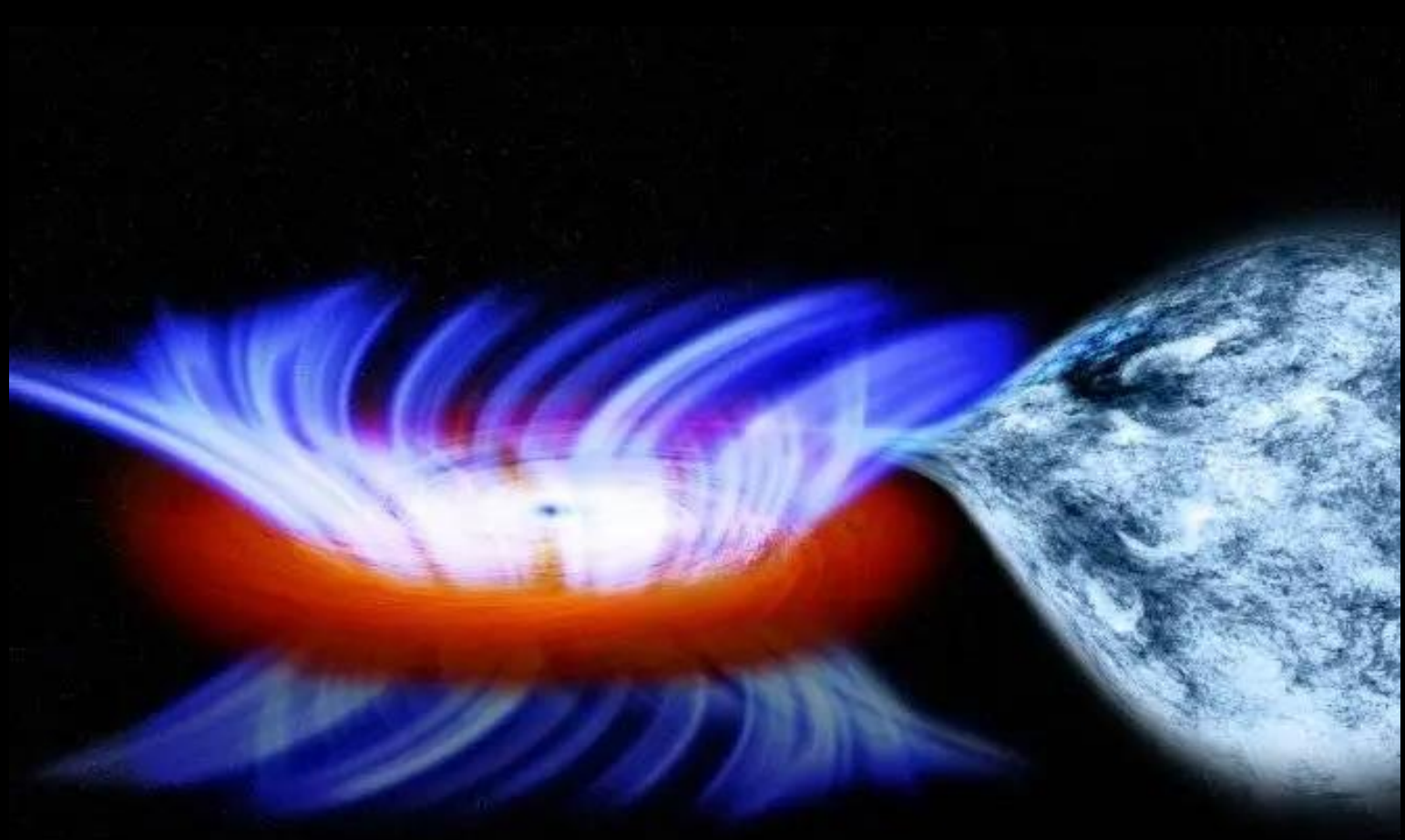
A black hole is a region in space where the gravitational pull is so strong that nothing, not even light, can escape from it.

remnants

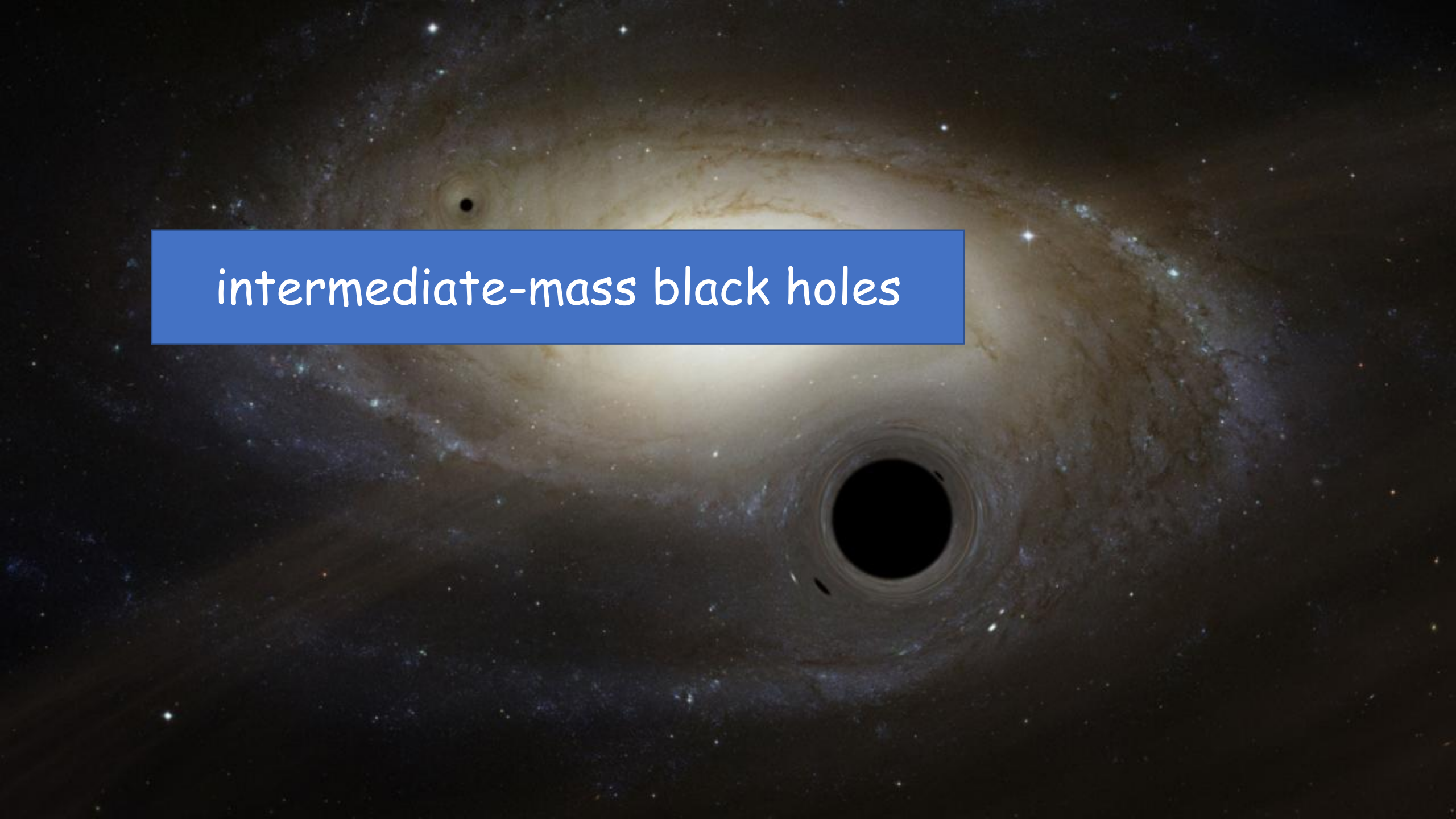
remnants

How are black holes formed?

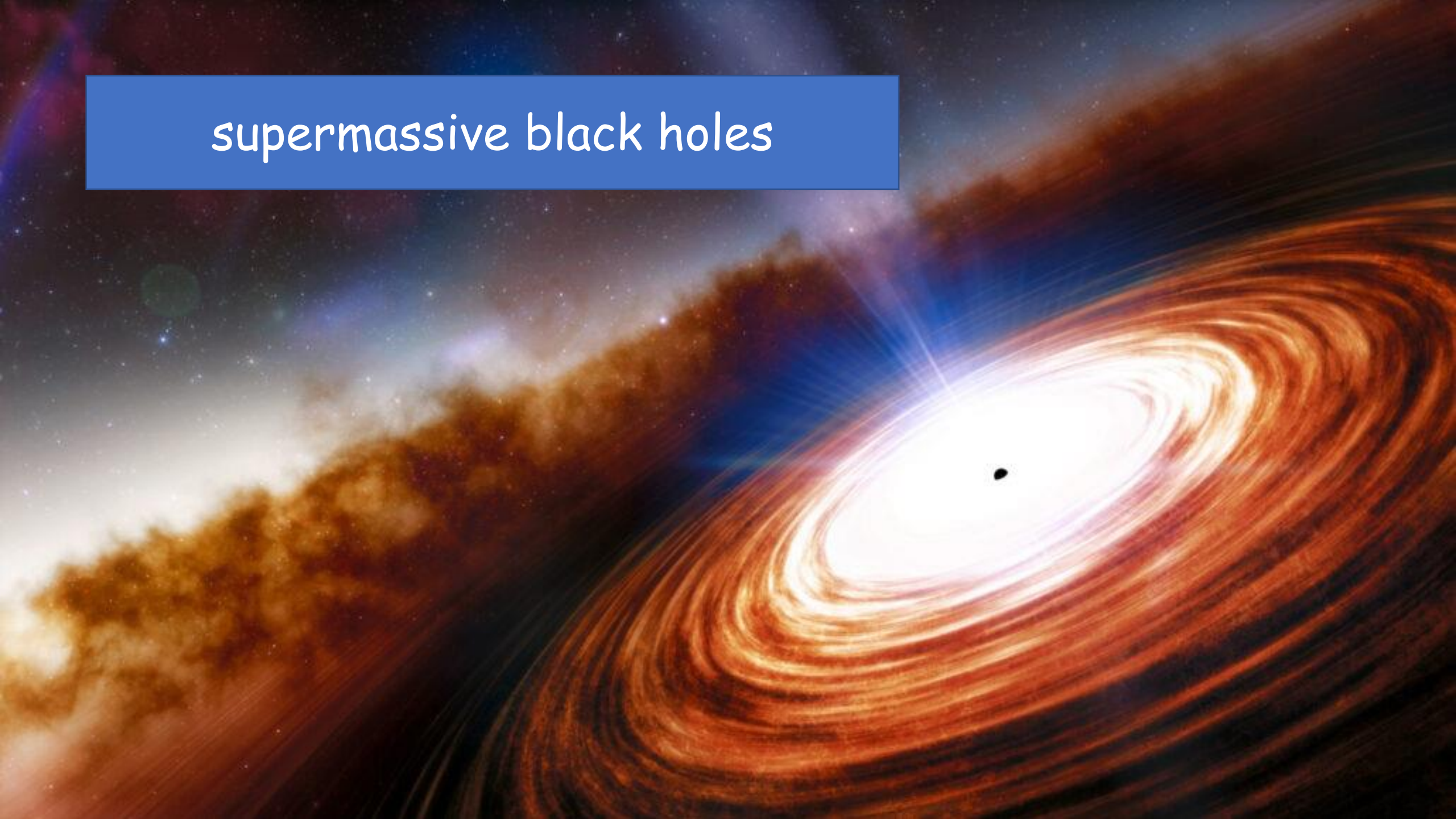
Black holes are formed from the remnants of massive stars that have undergone gravitational collapse.



Stellar-mass black holes


intermediate-mass black holes

supermassive black holes

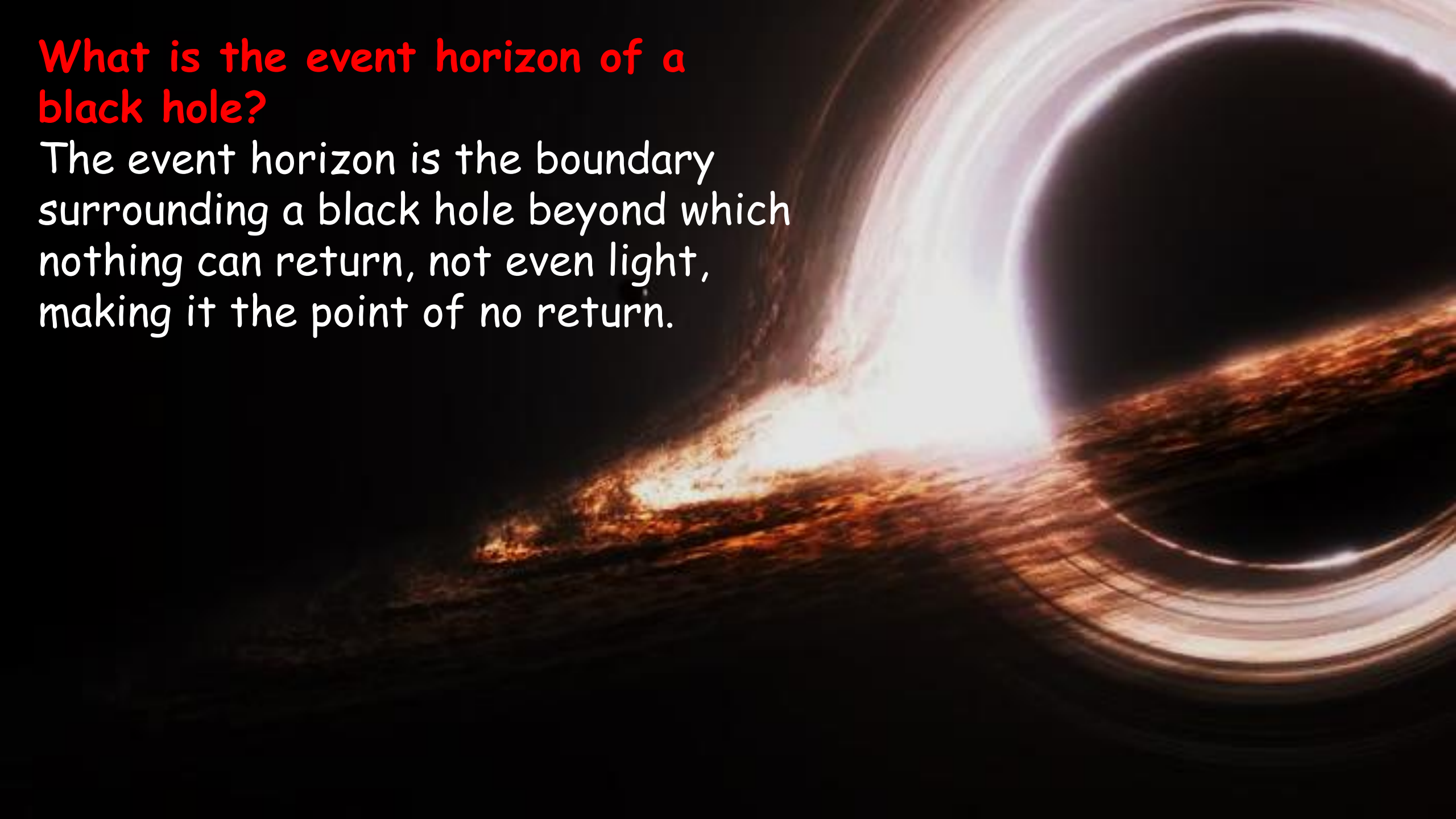


What are the three main types of black holes?

Stellar-mass black holes, intermediate-mass black holes, and supermassive black holes are the three main types of black holes.

What is the event horizon of a black hole?

The event horizon is the boundary surrounding a black hole beyond which nothing can return, not even light, making it the point of no return.



Black hole type: Supermassive

M32

Mass: 3,000,000 solar masses

The Sun

Do black holes have a size limit?

Black holes can come in a range of sizes, but ……
black holes at the centers of galaxies can be ……
or even …… of times more massive than our Sun.

Do black holes have a size limit?

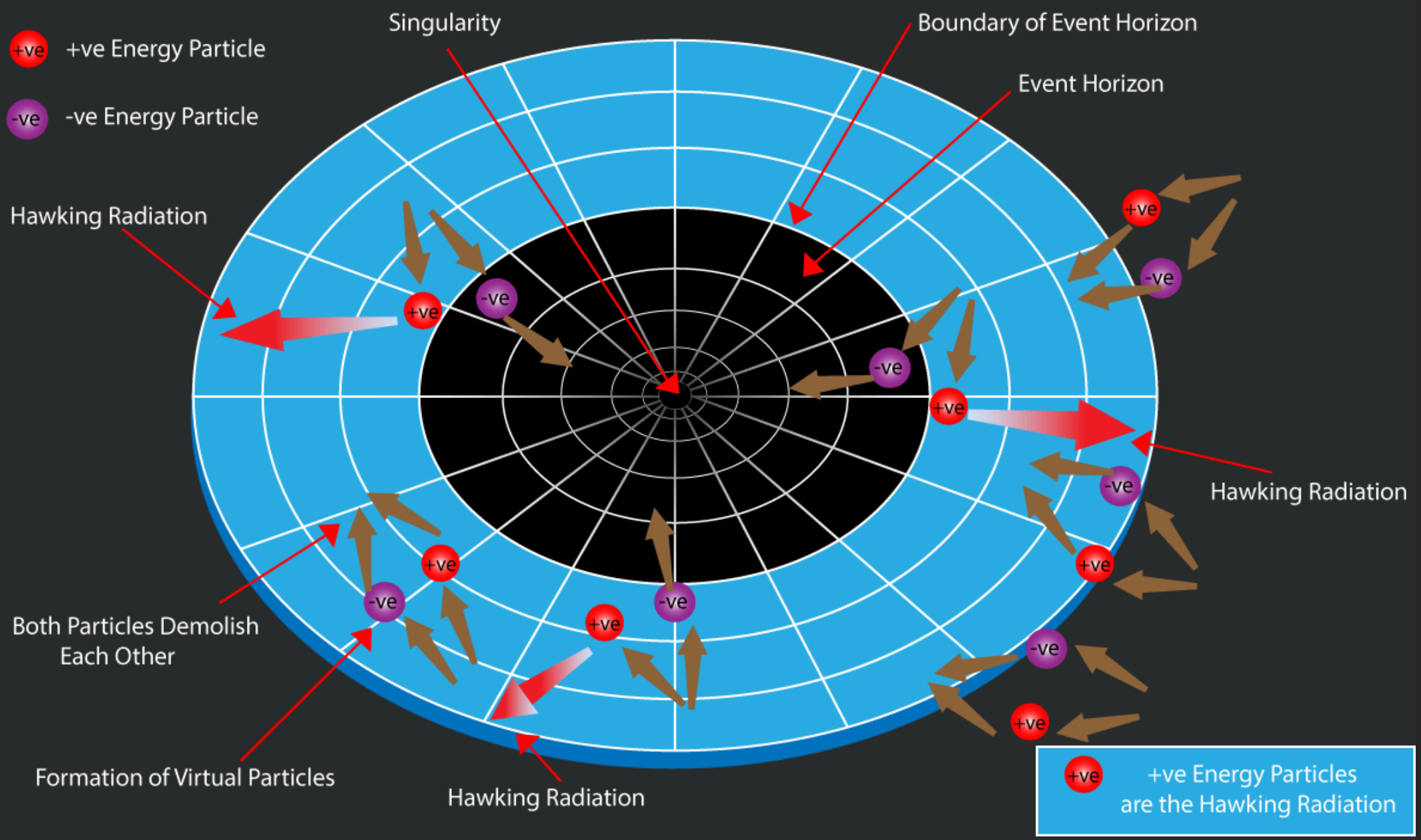
Black holes can come in a range of sizes, but supermassive black holes at the centers of galaxies can be million or even billion of times more massive than our Sun.

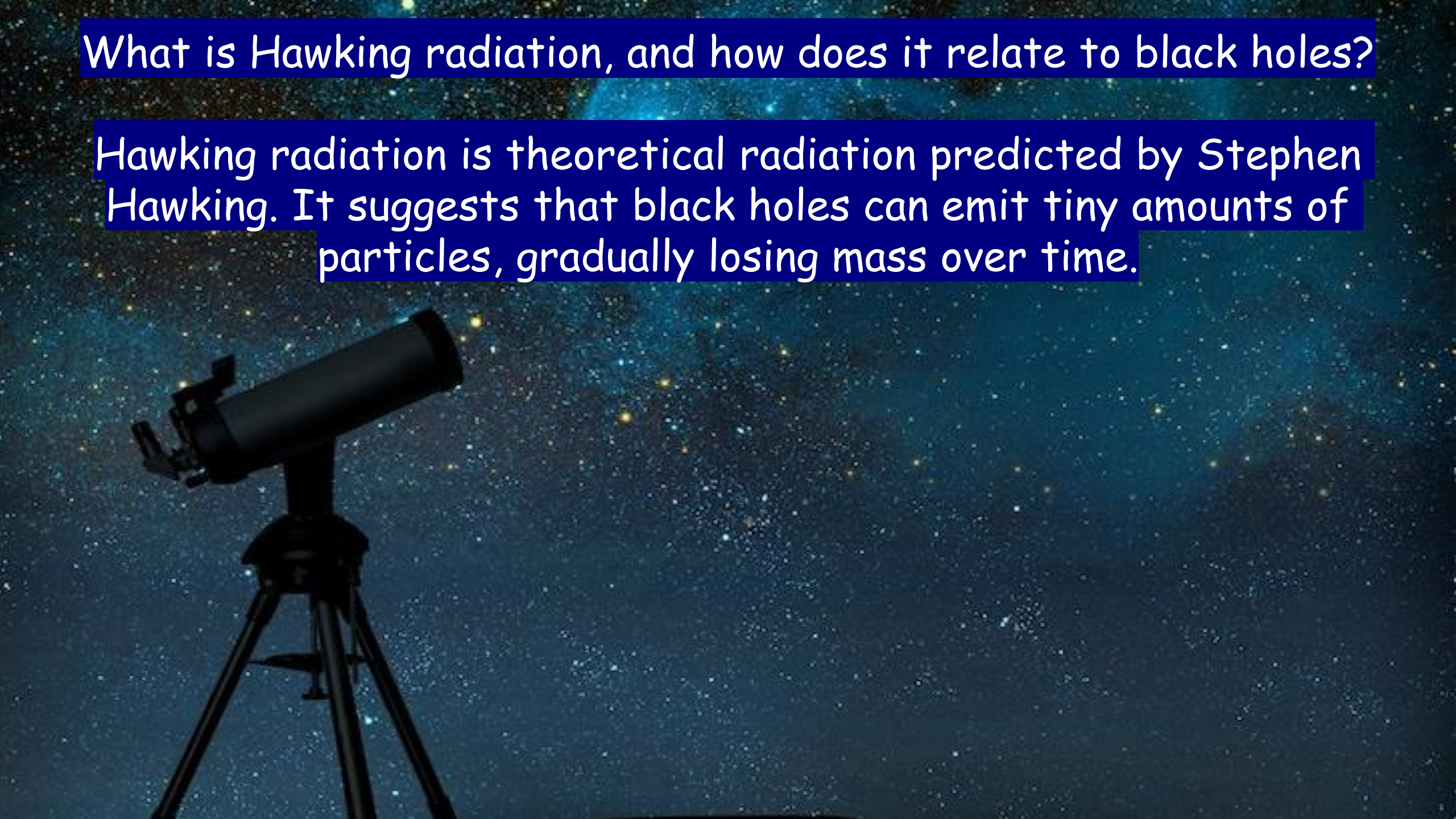
What would happen if you fell into a black hole?

What happens to matter that falls into a black hole?

Matter that falls into a black hole is compressed and its information is lost. It's thought to contribute to the black hole's mass and increases its gravitational pull.

Hawking Radiation





What is Hawking radiation, and how does it relate to black holes?

Hawking radiation is theoretical radiation predicted by Stephen Hawking. It suggests that black holes can emit tiny amounts of particles, gradually losing mass over time.

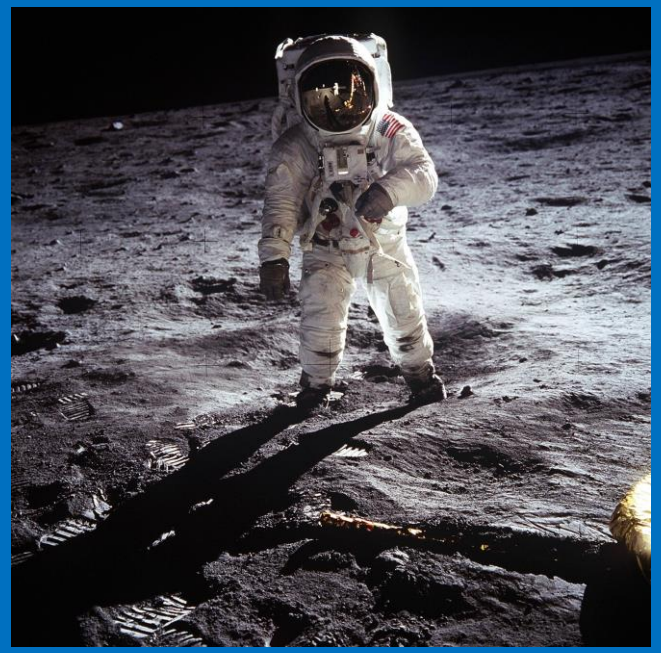
Can we see black holes directly?

We ……. see black holes directly, as they do not emit light. However, we …… observe their effects on nearby objects and detect radiation from accretion disks around them.

How are black holes detected and studied?

Astronomers use various methods, including studying

the motion of nearby stars
observing X-rays from matter falling into black holes
gravitational wave detectors to study black holes



Are there any known supermassive black holes in our galaxy?

Yes, the Milky Way galaxy is believed to host a supermassive black hole at its center, known as Sagittarius A* (pronounced "A-star").

Can we time travel using black holes?

Some scientists think that it might be possible to travel through time near a black hole, but this idea is still mostly a guess.

What is time dilation near black holes, and how does it connect to time travel?

Time dilation near black holes, which is a consequence of Einstein's theory of relativity means that time goes slower for someone close to a black hole compared to someone farther away. This effect has led to discussions about the potential for time travel, as it could allow for "time jumps" into the future, but it's still a big question mark in science.