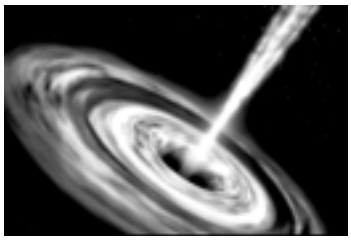
Black Holes



Black holes do not emit light, so we can't see them.

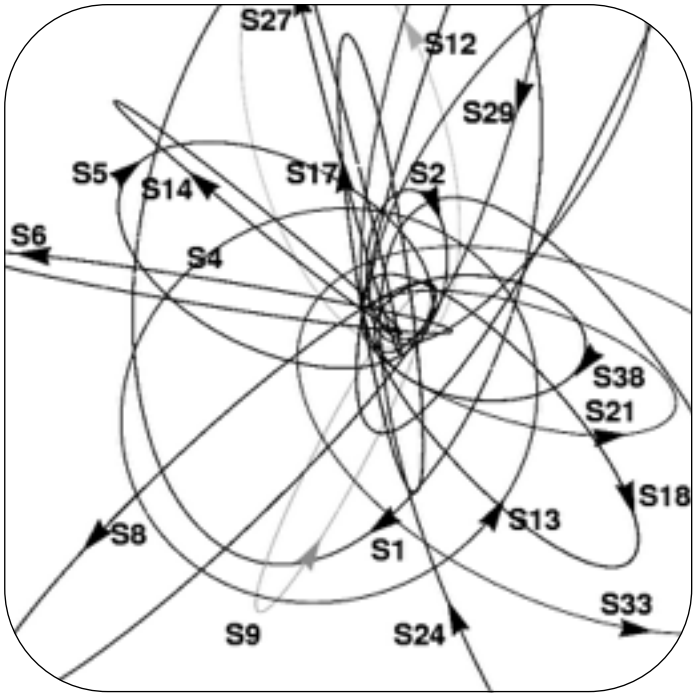
We can only infer where they are from their effects on the stars and gas clouds around them.

1. Astronomers track the orbits of stars to deduce where a black hole is.

   Use the gravity well and marbles to model **stars orbiting a black hole**.

On this diagram of stars orbiting the black hole at the centre of our galaxy, The Milky Way.

M**ark where you think the black hole is:**



2. Black holes can pull gas from nearby stars. **Gas spirals into the black hole.**

   Make a spiral of water between the bottles to model gas being pulled into a black hole.

3. Astronomers record the **orbit and speed of a star orbiting a black hole** to deduce the location and size of the black hole.

   Make a small “star” from play dough and attach it to one end of the stick. Make a large “black hole” from play dough and attach it to the other end of the stick.

   Slide the string along the stick until the star and black hole balance.

   Make the star and the black hole orbit each other by gently spinning the stick.

   Draw the orbit sizes of your star and black hole:

   Can you see whether the small star or the large black hole is moving faster?

4. Black holes bend light around them, called **gravitational lensing**.

   Use the wine glass centred over a coloured spot to model gravitational lensing.

   Draw what happens to the coloured spot. Compare to the real black hole on the right.