

# BLACK HOLES EXPLAINED

(7) Since you can't see a black hole, as it doesn't emit or reflect light, the only way to know it's there is to see its effects on the matter and energy around it. If you see stars or gases swirling around an invisible center, that's a good indication that there might be a black hole in the middle. Stars that come too close to a black hole can start to get ripped apart and bright clouds of gases can be seen being stripped from the star and swirling into the black hole.

(8) There are different types of black holes that differ in their size and origins. Miniature black holes have the mass of Mount Everest but

compacted into the space of an atom. They are thought to have formed when the universe was first created. A stellar black hole is formed by a star with a mass that is 3-20 times that of our Sun. It forms when a huge star explodes in what is called a supernova. What remains after the supernova is the stellar black hole. Hundreds of millions to billions of these may exist in our Milky Way galaxy. Supermassive black holes are thought to be in the centers of galaxies. Each one is millions of times the mass of our Sun. Supermassive black holes may have formed by the joining of several black holes and they get bigger and more massive as they attract more matter and energy to them.

## Article Questions

- 1) The gravitational attraction of black holes are so strong that not even light (6), which is the fastest known thing in the universe, can escape it. Miniature (8) black holes are thought to have formed when the universe first formed. Albert Einstein (2) developed the Theory of Relativity (2). Gravity (3) is the curvature of space-time.
- 2) What is a black hole?  
A black hole is a region in space-time that has an extremely high gravitational attraction due to its mass and density.(1)
- 3) What is space-time?  
Space-time is the three dimensions of space and the one dimension of time combined.(2)
- 4) What is the event horizon?  
This is the spherical boundary around a black hole within which no object, not even light, can escape the gravitational attraction of the black hole.(6)
- 5) What is a singularity?  
This is the concentrated mass of the black hole at its center.(6)
- 6) If a black hole is invisible, how can we determine when one is present?  
We can tell that it is there by the effect it has on the visible matter and energy around it. If matter swirls around an invisible center, it is likely that a black hole is in this invisible center.(7)
- 7) What is one major difference between a stellar black hole and a supermassive black hole?  
Stellar black holes are formed by the death of a star that is 3-20 times the mass of our Sun. Supermassive black holes have a mass that is millions of times that of our Sun and form when a group of black holes join and begin to draw in more and more matter.(8)