

Edges of the Universe

John Kormylo

The most important property of an event horizon is that time dilation reaches the point where time stops altogether. This means that not only can nothing escape from a black hole, nothing can fall into one either.

It should be noted that while gravity is strongest at the surface of a sphere of relatively constant density, escape velocity, potential energy and time dilation achieve their respective extrema at the center. This means that an event horizon first comes into existence as a single point in the center of the mass which creates it.

It is best to think of an expanding event horizon as a cone in time-space. Any object which attempts to cross this cone will get trapped in the moment, unable to move forward in time. This includes everything which had been inside the current radius of the event horizon. They are not **inside** the black hole; they are simply stuck in the past.

So one of the reasons nothing can escape from a black hole is that there is nothing **inside** the black hole to escape. All of the mass which creates it is on this side of the event horizon (in space-time).

Now, an observer falling into a black hole (assuming he survives the tidal stresses) from his own perspective would simply sail through the event horizon as if it wasn't there. Of course, behind him he would observe the universe come to an end in a flash of infinitely bright and blue shifted radiation. What happens after that is purely speculation.