

Re: Seeing Inside the Event Horizon of a Black Hole

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<carlip-nospam@physics.ucdavis.edu> wrote in message
news:cugkht\$knk\$2@skeeter.ucdavis.edu...

> *Michael J. Strickland <qualityser@worldnet.att.net> wrote:*

>> *If you are close enough to a black hole, can't you see inside
>> the event horizon?*

>

>> *A particle or photon leaving the black hole from inside the
>> event horizon needs $v > c$ to escape (reach $r = \text{infinity}$), but
>> won't it be able to move out to any $r < \text{infinity}$?*

>

> *This is why the Newtonian picture of a black hole as a star with
> escape velocity c shouldn't be taught (or should be taught only
> with **very** strong disclaimers).*

>

> *In Newtonian gravity, you would be right. In general relativity,
> you're not; light cannot move beyond the event horizon of a black
> hole at all. One way to look at this is to think of the event
> horizon as expanding at the speed of light. The curvature of
> spacetime near the event horizon happens to be high enough that
> even though it's expanding at the speed of light, its area does
> not increase -- not an intuitive idea, but that's how it works
> out. The upshot is that a general relativistic black hole is
> **very** different from a Newtonian one.*

I know it is just an analogy, but if the event horizon is expanding at the speed of light, anything outside the event horizon moving out at less than the speed of light will eventually become enveloped by the event horizon (fall into the black hole).

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