What If You Fell Into a Black Hole?

Ushasi Chaudhuri & Dikshya Ratha

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IIT Bombay

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Introduction

- What is a black hole?
- How is it formed ?
- What happens if you fall into one?

Lets find out!

https://www.rdmag.com/news/2018/01/black-hole-breakthrough-new-insight-mysterious-jets

What is a black hole?

Definition (Black hole)

A *black hole* is a region of space having a gravitational field so strong that light cannot escape.

- You can't see them
- First predicted in Einstein's general theory of relativity
- Is a stellar remnant
- Compact and Extremely dense
- Presence can be inferred from it's interction with matter and EM radiation

What is a black hole?

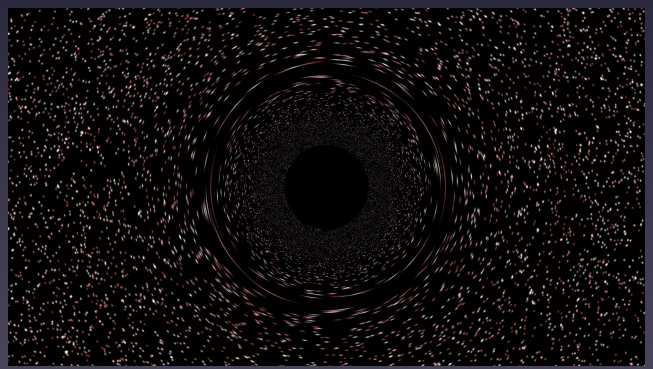
- So, a black hole isn't a void. Rather it is a huge amount of mass concentrated in a small space.
- Formed by gravitational collapse of a massive star.
- A black hole highly curves the space
- A distance of even a few centimetres may increase the force of gravity million times more.
- We now have an idea of what could happen to you if you fell through it.

Black Hole and Event Horizons

Definition (Event Horizon)

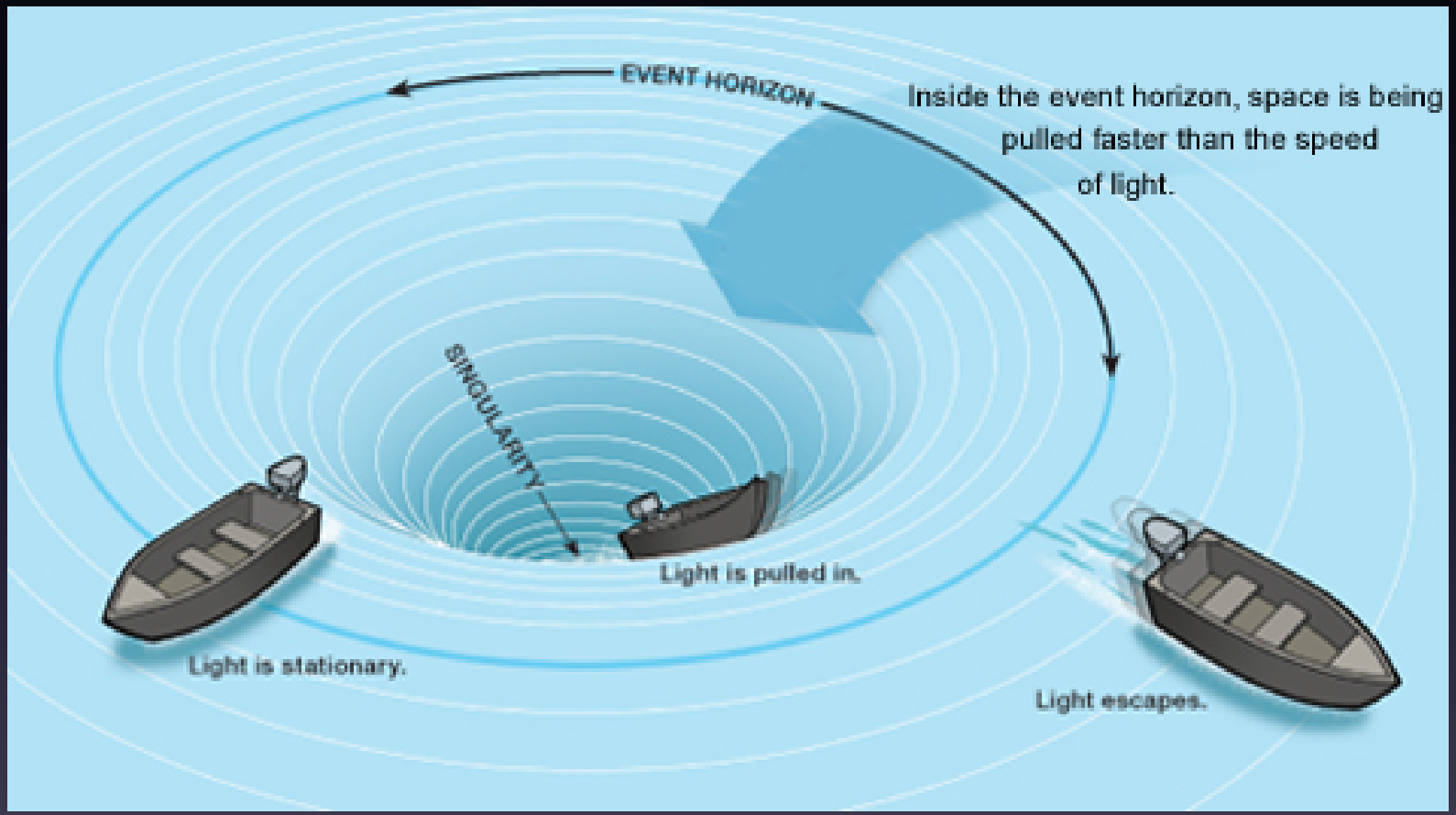
Every black hole has an event horizon, the point at which the gravitational pull becomes so strong that you cannot escape it. Crossing this, you reach the point of no return!

- If you found yourself outside of that point, you'd see that the stars are twisted around a perfect circle of darkness.
- **Bad news** Now as you go nearer to a black hole, you will be pulled faster and faster towards a black hole, accelerated by he force of gravity.



https://physics.stackexchange.com/questions/195427/is-the-event-horizon-of-black-holes-visibly-sharp-or-blurry

Event Horizons



https://notesfromdisgraceland.wordpress.com/2017/06/08/event-horizon-and-the-physics-of-donald-trump/

Stellars

- Most common type of black holes.
- Stretch up to 9 miles across, can be as heavy as 20 suns.
- You you happen to fall into these black holes, you would be torn apart even before you reach the event horizon.
- What happens if you choose a super massive one (approx a million times our sun's mass?) **Good News-** Your body remains unharmed! Why?
- Wondering where to find one? You can find one right at the center of our Milky way galaxy. Luckily, it is 165 quadrillion miles away from us.

Ready to go?

Do not pack your suitcases yet. Crossing the event horizon is just the beginning of the challenge.

- **Gravitational singularity** at the center of the black hole, where density becomes infinite. You would be squashed into that center and become one with the black hole.
- If a person is to observe you from outside the event horizon, they would see you slowing down and just freeze, never actually crossing the event horizon!!
- Why? Space and time swap their roles inside a black hole.

https://resources.perimeterinstitute.ca/products/how-do-you-make-a-black-hole?variant=36262297158

May I ask you??

Would you dare to take the risk and jump into a black hole?☺

References

- Hawking, Stephen. Black holes and baby universes and other essays. Random House, 1994.

- https://en.wikipedia.org/wiki/Black_hole

Thank You