# Time travel using a black hole (wall)

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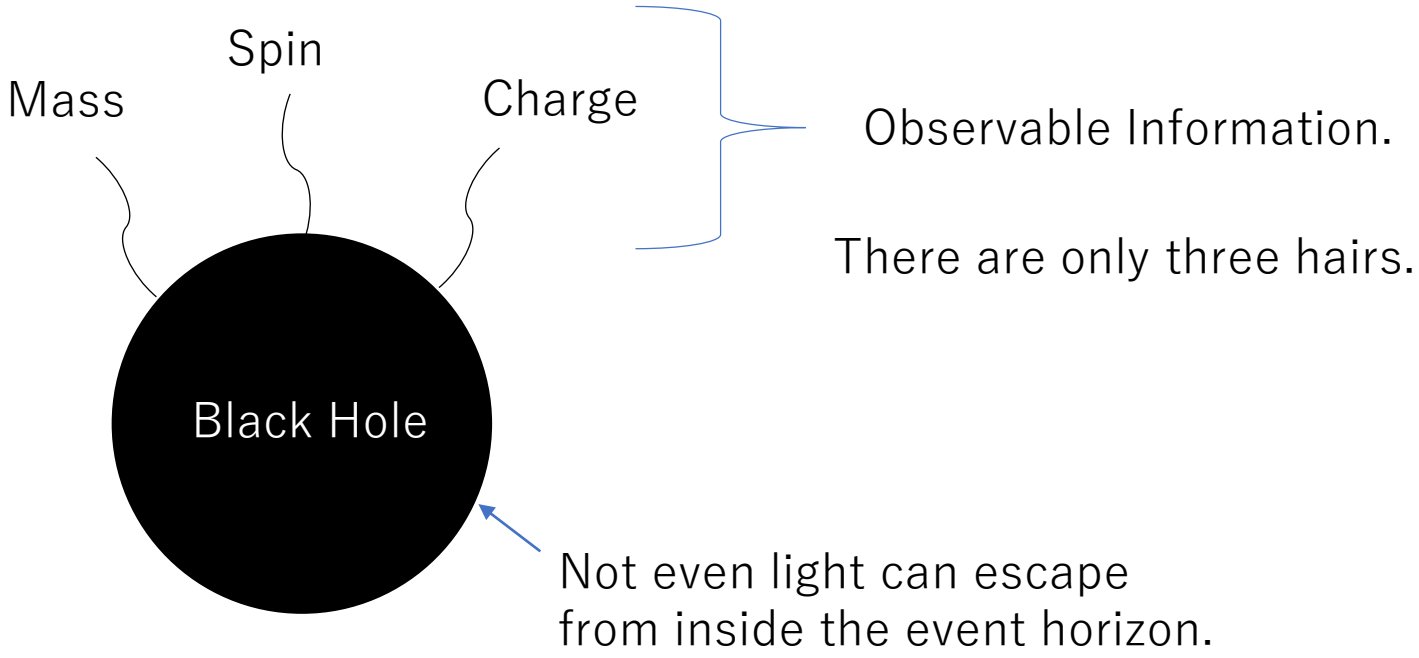
## Black Hole No-hair theorem




A great detective explains time travel using black holes.
First, he explains the black hole hair removal theorem.
Not even light can escape from inside the event horizon.
Therefore, from the outside, only three quantities of a black hole can be observed: its mass, spin, and charge.
With an ordinary star, we can obtain a lot of information about the matter that makes it up.
The information we can obtain from a black hole is like only three strands of hair, so it's called the hair removal theorem.

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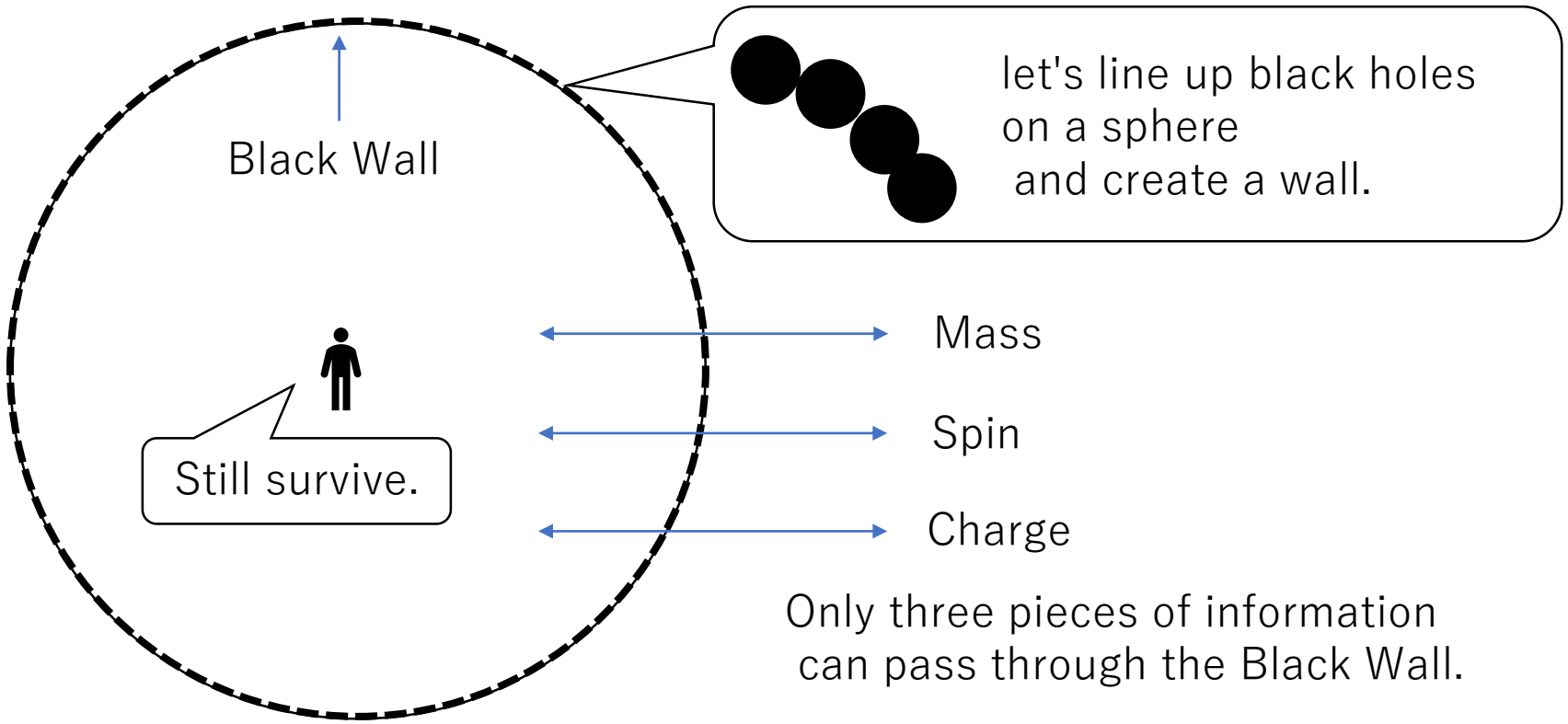
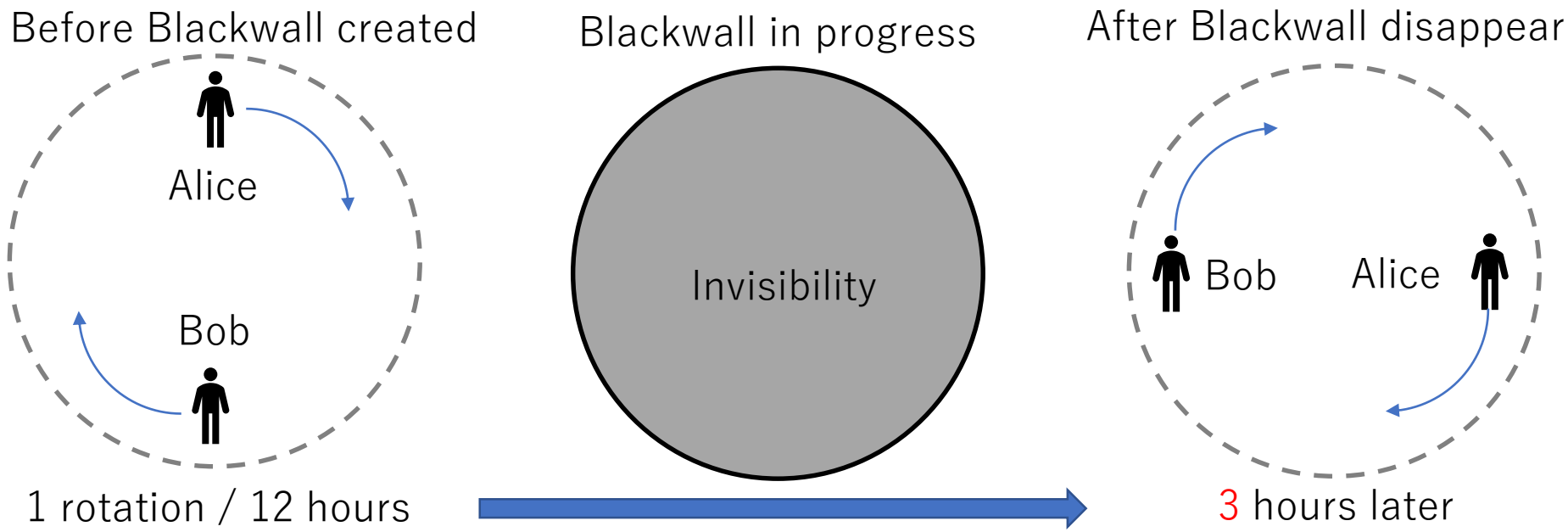
## Black Wall




If you go inside the event horizon of a black hole, you will not survive.
So, let's line up black holes on a sphere and create a black wall.
Only three pieces of information can pass through the black wall.
The black wall will collapse under its own weight.
If you just go inside the black wall, you will still survive.

# Time travel using a black hole (wall)

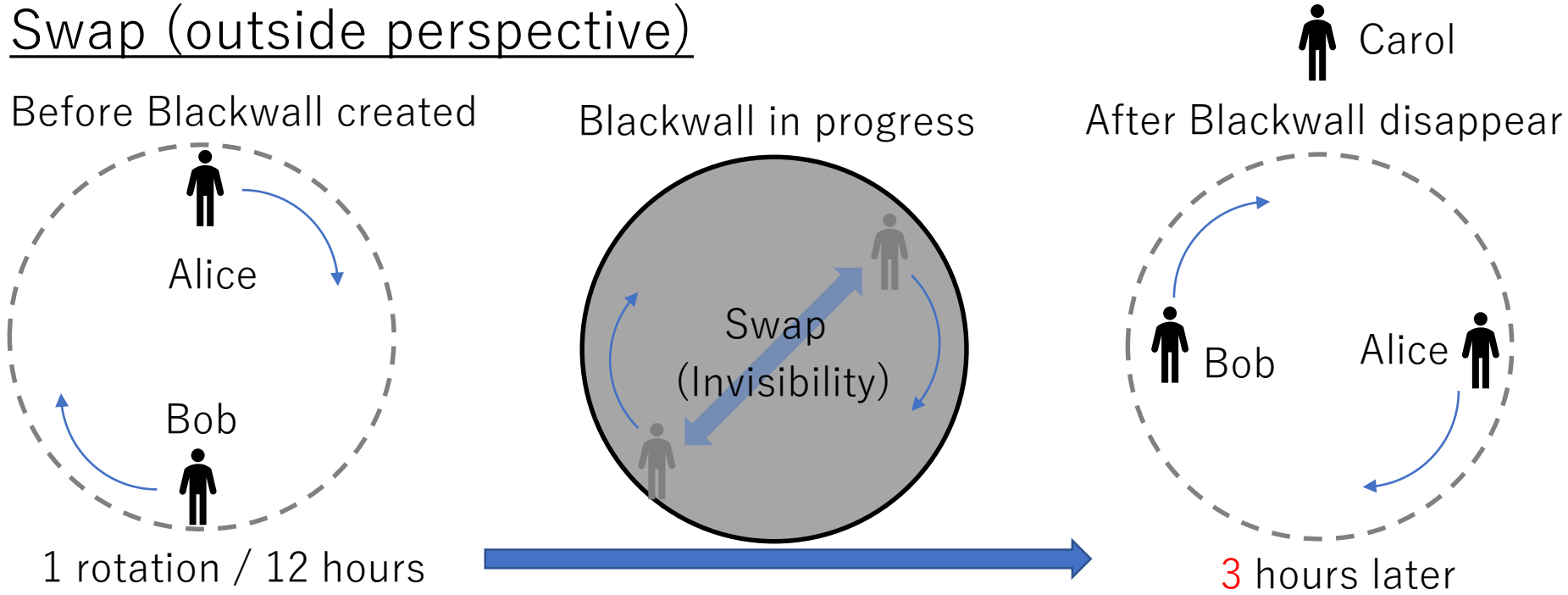
## Clock




We will begin a time travel thought experiment.
Let's imagine that Alice and Bob rotate once every 12 hours around a certain point.
A black wall is generated centered on that point.
At that time, Alice will be at 12 o'clock and Bob will be at 6 o'clock.
While the black wall is generated, you cannot see inside.
Three hours later, we will make the black wall disappear.
Alice should now appear at 3 o'clock and Bob at 9 o'clock.

# Time travel using a black hole (wall)

## Swap (outside perspective)

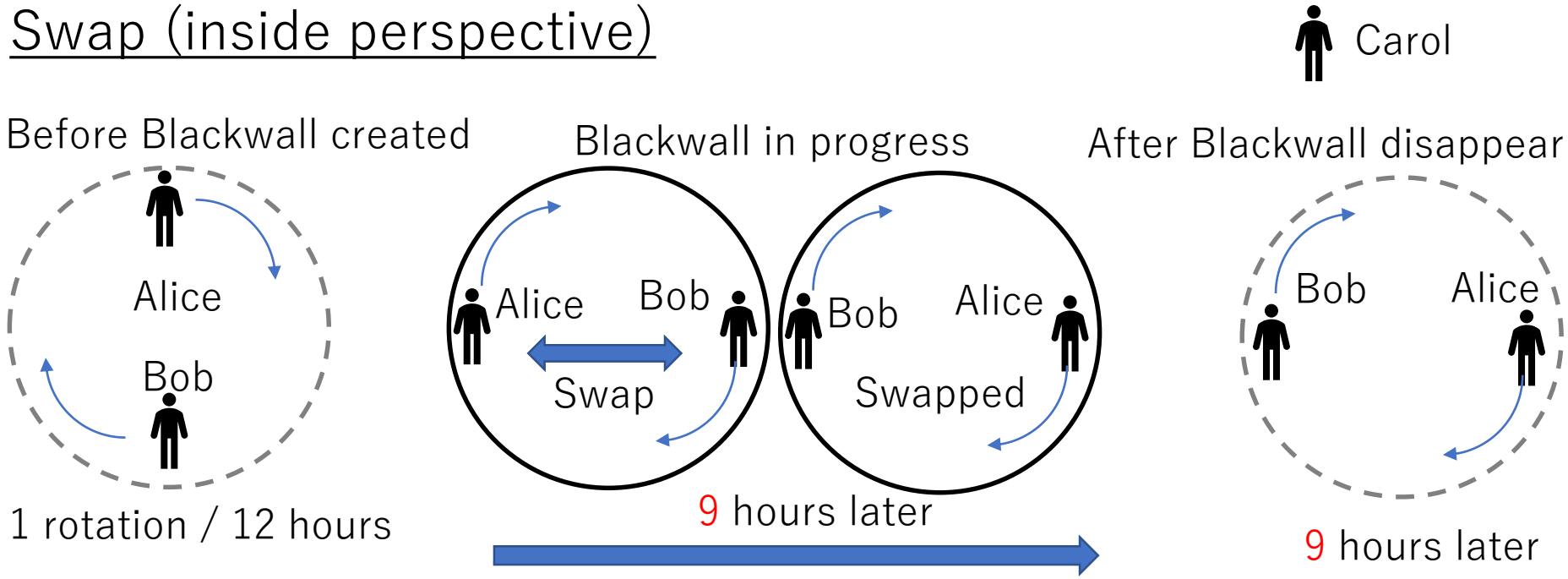



Carol receives no information that the two have swapped places.
The two continue to rotate without swapping places.

Let's consider what happens if Alice and Bob swap places while a black wall is occurring.
Let's think about this from the perspective of Carol, who is outside.
If they both have the same weight, their angular momentum does not change even if they switch places.
From the outside, only angular momentum can be seen.
Carol receives no information that the two have swapped places.
The two continue to rotate without swapping places.
After three hours from the outside, Alice should appear at the 3 o'clock position and Bob should appear at the 9 o'clock position.

# Time travel using a black hole (wall)

## Swap (inside perspective)




Let's think about this from Alice and Bob's perspective.
Nine hours after the Black Wall is created, Alice should be at the 9 o'clock position and Bob should be at the 3 o'clock position.
If the two of them swap places during that time, Alice will be at the 3 o'clock position and Bob will be at the 9 o'clock position.
Nine hours after it is created, the Black Wall will collapse from the inside.
After 9 hours have passed inside, Alice should emerge at the 3 o'clock position and Bob should emerge at the 9 o'clock position.

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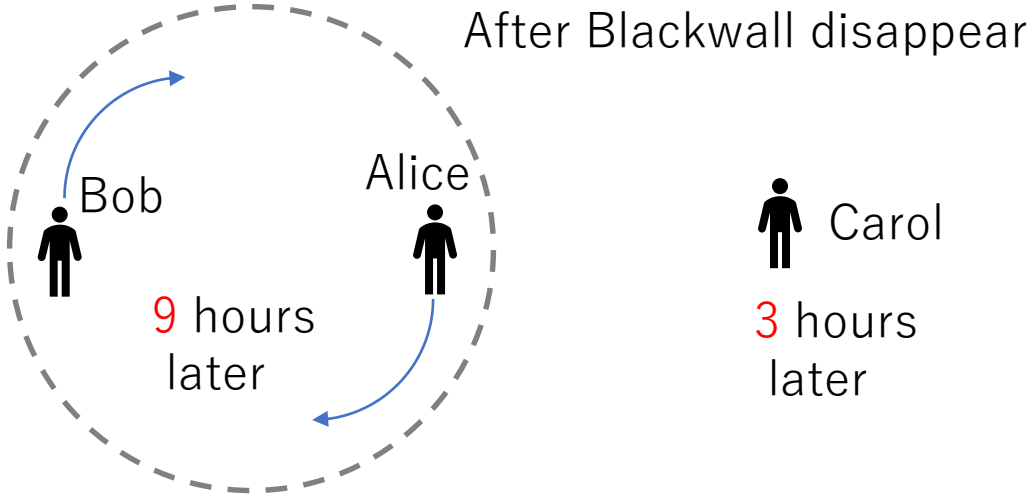
## Alignment of both perspectives




From both the inside and outside perspectives,
Alice appears at the 3 o'clock position and Bob appears at the 9 o'clock position.

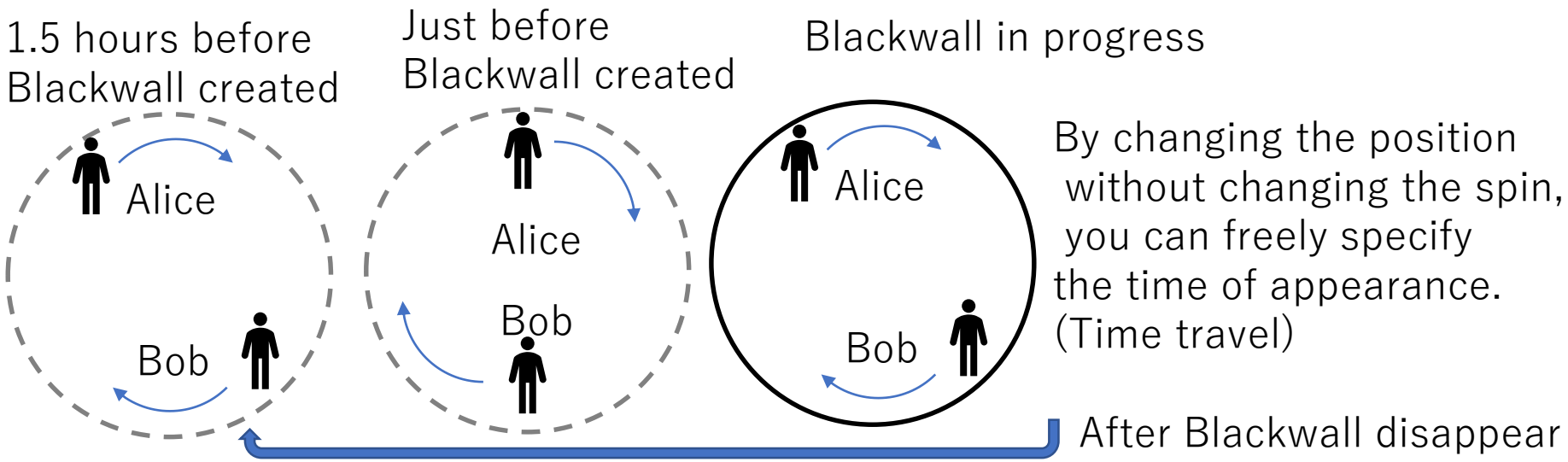
While 9 hours have passed for Alice and Bob, only 3 hours have passed for Carol.

Alice and Bob have traveled back in time 6 hours.

As a result, from both the inside and outside perspectives, Alice appears at the 3 o'clock position and Bob appears at the 9 o'clock position.
However, while 9 hours have passed for Alice and Bob, only 3 hours have passed for Carol.
Alice and Bob have traveled back in time 6 hours.
However, because information is blocked, no causal time paradox occurs.
This can be interpreted as simply the speed at which time flows changing inside and outside.

# Time travel using a black hole (wall)

## Time travel




By changing their positions without changing their angular momentum, Alice and Bob can freely specify their appearance time.
They can time travel to any time.
They can also align their positions with those before the Black Wall occurred.
In that case, they will time travel to before the Black Wall occurred.

# Time travel using a black hole (wall)

## Time paradox

If you travel back in time,
the same person will exist at the same time and at the same coordinates.

There are three ways to resolve this time paradox.

(1) In the many-worlds interpretation, it has branched into a different world line.

(2) It's the same world line, but the exit is somewhere in a consistent universe.

(3) This method does not allow time travel to the past.

The no-hair theorem for black holes may not be correct.
In other words, it may be possible to see information
inside the event horizon from the outside.
Black holes may just be massive stars.

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## Time Circuit Experiment

It's impossible to say for sure
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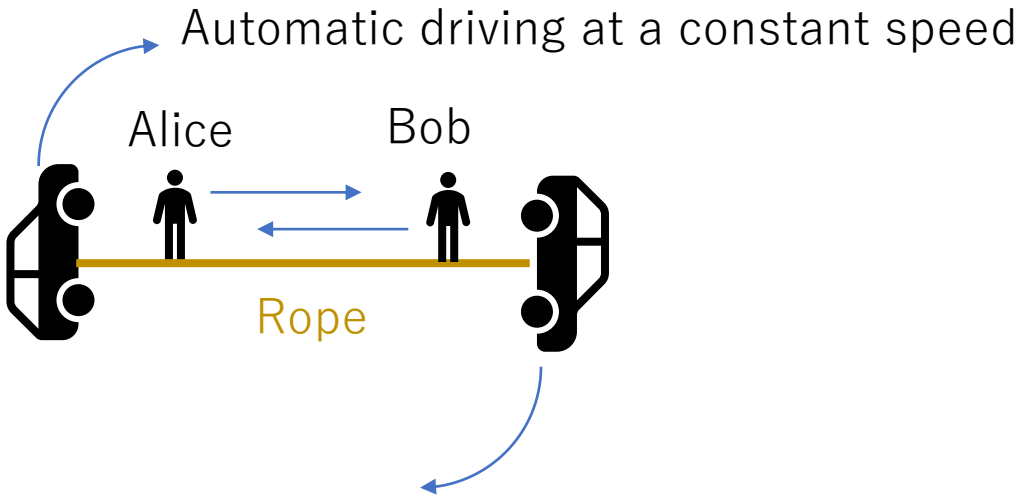


Alice and Bob will walk on the rope and switch places.
Please be careful not to fall off.

It's impossible to say for sure whether time travel is possible until we actually test it.
First, prepare two cars to carry Alice and Bob.
The two cars will be autonomous and travel at a constant speed.
The two cars are connected by a rope, which gives them rotational motion.
This is the time circuit.
Alice and Bob will walk on the rope and switch places.
Black walls will be deployed all around them.
Please be careful not to fall off.

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## Time machine


Jelly Human

Take a look at this photo of what is believed to be an actual time machine.
Its harrowing appearance gives us a glimpse into the brutality of traveling through time and space.
A jelly human would be grotesque, so we've included an illustration instead.
It seems the world is rejecting time travel.
Is that the world's choice?
La yodasou stiana.

# Contact Information

For inquiries,

please contact us here.

https://ultagi.org/