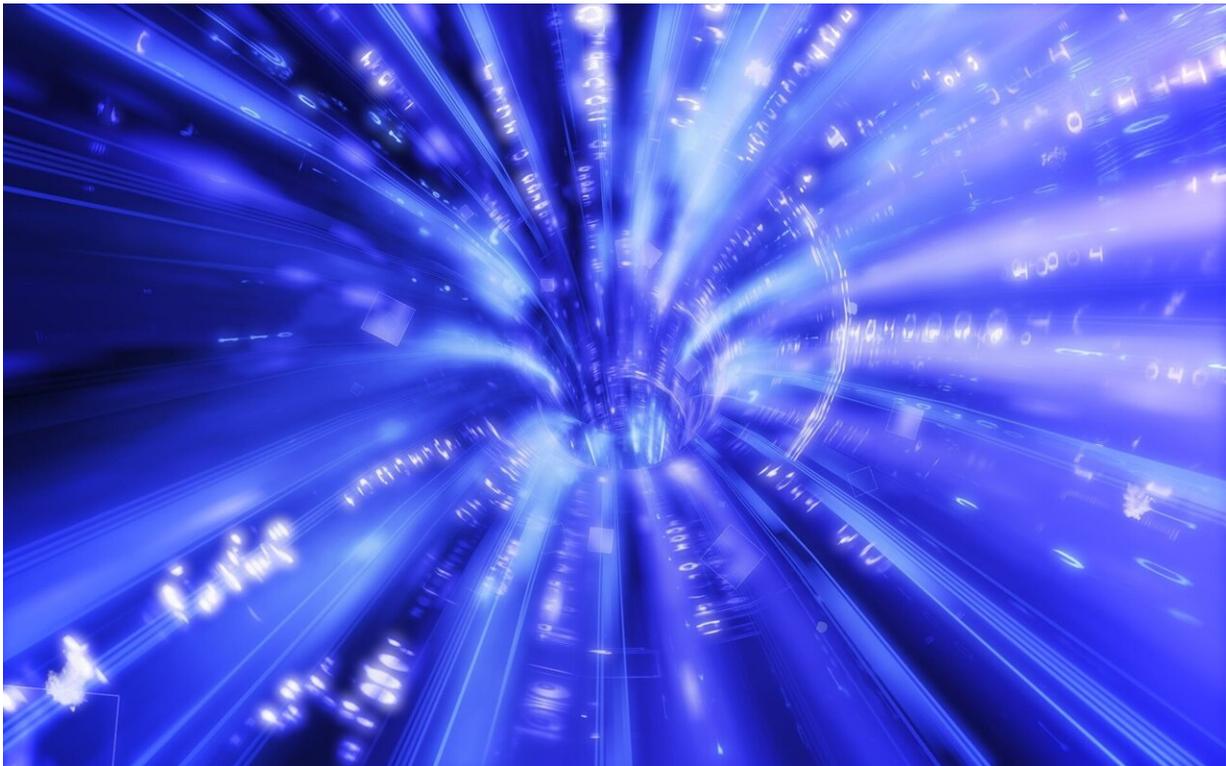


Video: Can wormholes act like time machines?

April 30 2020, by Paul M. Sutter



Credit: CC0 Public Domain

Time travel into the past is a tricky thing. We know of no single law of physics that absolutely forbids it, and yet we can't find a way to do it, and if we could do it, the possibility opens up all sorts of uncomfortable paradoxes (like what would happen if you killed your own grandfather).

But there could be a way to do it. We just need to find a wormhole first.

Wormholes are shortcuts through space, a tunnel that connects two distant parts of the universe through a very short path. If you could somehow construct a wormhole, you can casually walk down through the tunnel and end up thousands of light years away [without even breaking a sweat](#).

And they can also act as time machines.

The trick is to take one end of the wormhole and accelerate it close to the speed of light. We know through the special theory of relativity that moving clocks run slow, and objects that travel close to the speed of light experience a different flow of time than stationary ones. So if you take one end of the wormhole and make it go really, really fast for a while, its internal clock will not be synchronized with the other end.

Then you just have bring back the traveling end of the wormhole next to the opposite end. Since they won't be synchronized, one of the wormhole will be in the "past" of the other end. So you go into the present-day end, travel down the tunnel, and you'll end up coming out in your own past.

It seems trivially easy, and a way to cheat nature out of the restrictions on [time travel](#), but nature doesn't seem to like wormholes either. Every time we try to concoct a way of building one we realize that they're actually inherently unstable – the moment you step foot in one, it collapses, spreading your bits and pieces throughout the universe.

How fast do they collapse? Faster than even a beam of light could race down the tunnel of the wormhole. So it seems that even if we found a [wormhole](#) floating around in outer space, we wouldn't be able to use it.

But one can always dream...

Provided by Universe Today

Citation: Video: Can wormholes act like time machines? (2020, April 30) retrieved 19 September 2024 from <https://phys.org/news/2020-04-video-wormholes-machines.html>

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