

AMAZING ALCUBIERRE DRIVE AND FASTER-THAN-LIGHT TRAVEL

Genres: Engineering, Science and Technology, Time, Universe

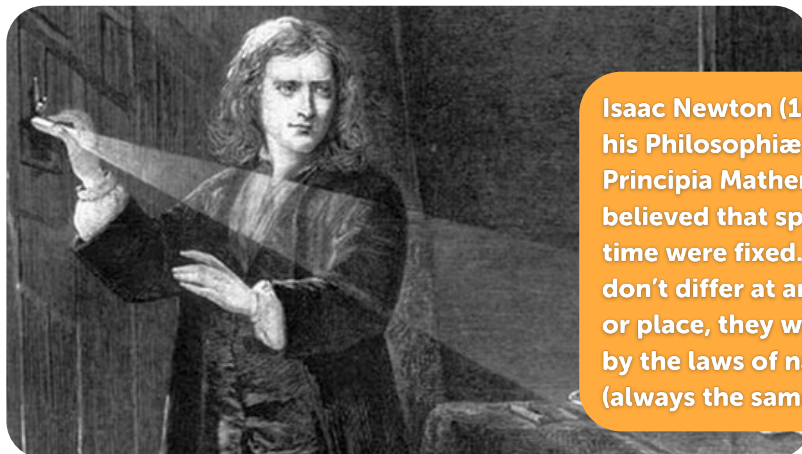
Imagine sitting in a chair, watching the vastness of outer space... You power up the engines, press the button, and boom – you arrive on Mars. This supersonic speed is called the Alcubierre Warp Drive, a method (also known as FTL (Faster-Than-Light) travel, Hyperspace, Lightspeed, etc.) that enables a spacecraft to travel faster than the speed of light.

How did we discover the ability to warp the space-time continuum (aka travel faster than the speed of light)?



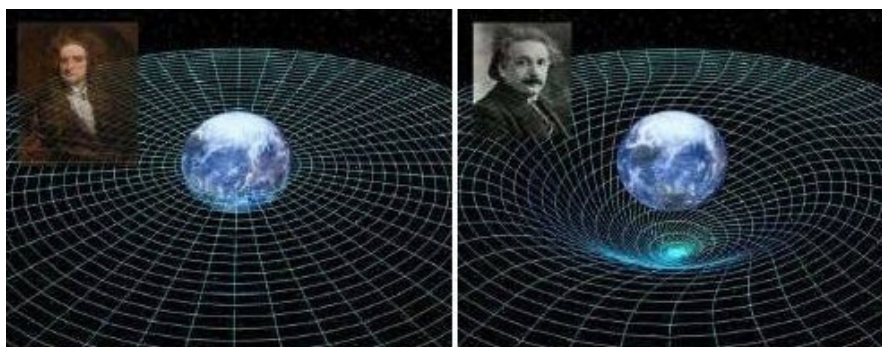
How It All Began

If we go back to the beginning of the 20th century, people believed that space was like a huge stage, where cosmic events played out and even if you removed everything, you would still have a permanent, unchangeable space.



Isaac Newton (1687) in his *Philosophiæ Naturalis Principia Mathematica* believed that space and time were fixed. They don't differ at any time or place, they were fixed by the laws of nature (always the same).

Within this large space, you couldn't, it was believed, go faster than the laws of gravity. However, this all changed with Albert Einstein's Special Theory of Relativity in 1905. Einstein imagined that space is not just fixed and empty, but corresponds with time so that an object has mass and makes a dent in the space-time continuum. It means that the larger the object, the larger the dent in time and space. If you bend space so much, you can officially use space-time to make it move around you, instead of you moving through it. In theory, within this space, you could move ten times the speed of light.



Newton's fixed space

Einstein's flexible space-time

Einstein published in a 1905 paper that space is constantly being warped and curved by the matter and energy moving within it, and time flows at different rates for different observers. Newton believed that space was fixed, and unchangeable.

In 1994, a Mexican physicist by the name of Miguel Alcubierre ran with Einstein's idea. He proposed that stretching the fabric of space-time would enable FTL travel to happen. According to Alcubierre, space travel involves stretching the fabric of space-time in a wave which would (in theory) cause the space ahead of an object to contract while the space behind it would expand. An object inside this wave (i.e., a spaceship) would then be able to ride in this region, known as a "warp bubble", making the craft reach distant stars in no time.



Physicist Miguel Alcubierre suggested in 1994 a way to travel at the speed of light by riding in a bubble in the space-time fabric using an Alcubierre Drive.

This is known as the Alcubierre Drive.

Alcubierre Drive and Space Travel

Many scientists believe that we will, one day, be able to travel at the speed of light. Dr. Harold White, a Physics and Quantum Propulsion scientist, who has been working on the Alcubierre drive for seven years at NASA's Johnson's laboratory says,

"We have moved a small atom at the speed of light. We will start to use this technology in the late twenty-thirties for the future of human space travel."

But White is not the only warp drive theorist around... Alexey Bobrick of the New York-based lab also outlines,

"We have branched out on a different path from NASA's Alcubierre Warp Drive. We believe that there are several different classes of warp drives that can be used for space travel."



There are several theories about how warp drives can work and how they can be used for space travel.

Not all scientists agree as some say for a spaceship to travel within a warped bubble of space would require materials that don't exist on planet earth.

What do you think? Are you ready to fasten your seatbelts and jump to Proxima Centaury? Or, do you want to travel from London to Los Angeles in a matter of seconds, before reaching beyond the stars?

The next ten years will surely tell us whether it is possible

Questions to answer:

- What did people believe about speed before Einstein's Theory of Relativity?
- What is the Alcubierre Drive?
- Why do some scientists believe that we will be able to break the speed of light?
- Do you think we should try to break the speed of light barrier? Why or why not?

Key Vocabulary

Add these to My Words to build your vocabulary.

- vastness
- supersonic
- spacecraft
- cosmic
- correspond
- continuum
- physicist
- spaceship
- technology
- warped



Use My Words to play games that will help you build your vocabulary.



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