



1  
00:00:00,000 --> 00:00:04,170

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Narrator: So, you're planning your next vacation to the cosmos.

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00:00:04,170 --> 00:00:07,590

You've picked out a few potential places to go, you've marked your map...

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00:00:07,590 --> 00:00:12,095

...and you've also somehow rigged up your spaceship to...travel at almost the speed of light?

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00:00:12,095 --> 00:00:15,265

How did you...so how are you going to...  
uh..

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00:00:15,265 --> 00:00:17,392

6  
00:00:17,392 --> 00:00:19,352

Well, here we go, I guess!

7  
00:00:19,352 --> 00:00:21,312

Before you fly off all willy-nilly, however,

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00:00:21,312 --> 00:00:25,025

there are some important things you should probably know about approaching the speed of light.

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00:00:25,025 --> 00:00:29,571

First, a lot of weird things can happen, like time and space getting all bent out of shape.

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00:00:29,571 --> 00:00:32,365

For example, If you're moving at nearly the speed of light,

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00:00:32,365 --> 00:00:36,995

according to the clock inside your rocket, you'll only take a bit more than half the time to reach your destination

12  
00:00:36,995 --> 00:00:39,414  
compared to what a clock on your planet would say.

13  
00:00:39,414 --> 00:00:42,250  
The end result is that while your clock might move normally to you,

14  
00:00:42,250 --> 00:00:44,753  
you'd see the clocks back home had moved further when you return,

15  
00:00:44,753 --> 00:00:48,089  
so you might want to reschedule your dental appointments  
before you leave.

16  
00:00:48,089 --> 00:00:50,050  
Also, because you're going so fast,

17  
00:00:50,050 --> 00:00:55,430  
what would otherwise be just a few hydrogen atoms  
that you'd run into quickly becomes a LOT of dangerous particles,

18  
00:00:55,430 --> 00:00:59,809  
so you should probably have shields that keep them from frying  
your ship and also likely you.

19  
00:00:59,809 --> 00:01:04,939  
And finally, you wouldn't want to accelerate too quickly toward  
the speed of light, because, well.

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00:01:04,939 --> 00:01:06,357

21  
00:01:06,357 --> 00:01:08,985  
However, since it looks like you've figured all that out already,

22  
00:01:08,985 --> 00:01:12,238  
let's talk about how long it takes to travel around the universe.

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00:01:12,238 --> 00:01:18,620

While you will be traveling very fast, the universe is also a very big place, so you might be in for some surprises.

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00:01:18,620 --> 00:01:21,289

For example, even though you're traveling at almost the speed of light—

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00:01:21,289 --> 00:01:25,794

and, as you remember, the time and space weirdness will make the distance seem shorter to you—

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00:01:25,794 --> 00:01:31,341

your rocket's clock will still say it takes a bit more than nine months just to get from the Earth to the edge of the solar system.

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00:01:31,341 --> 00:01:35,595

According to a clock on Earth, it's even longer—over a year and a half.

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00:01:35,595 --> 00:01:41,476

That's not too bad, but to get to the next star system, your clock would say it took you just over 2 years.

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00:01:41,476 --> 00:01:43,603

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00:01:43,603 --> 00:01:44,729

...Okay then!

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00:01:44,729 --> 00:01:49,651

If you want to get to farther-out vacation spots, however, you'll probably need more than a few extra snacks.

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00:01:49,651 --> 00:01:54,739

A trip to the Andromeda galaxy, our nearest large neighbor galaxy, could take over a million years,

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00:01:54,739 --> 00:01:59,869

and a trip to the farthest known galaxy where it currently is might take over 15 billion years,

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00:01:59,869 --> 00:02:03,373

which...is more vacation time than I think I'll ever have.

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00:02:03,373 --> 00:02:08,128

Of course, again, since time gets all weird the closer you get to lightspeed, your actual travel time will be...

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00:02:08,128 --> 00:02:13,299

um...a bit shorter than that... depending on...just a couple of...

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00:02:13,299 --> 00:02:16,302

(Narrator sighs)

That's something we can talk about later.

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00:02:16,302 --> 00:02:20,557

Either way, that should sum up some of the big things you might run into with near-light-speed travel.

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00:02:20,557 --> 00:02:28,398

But in the meantime, make sure to buckle up, enjoy your snacks, and please...be safe out there.

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00:02:28,398 --> 00:02:30,275

(silence)