

# Re: Time travel into the future

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*Source:* <http://sci.tech-archive.net/Archive/sci.physics/2007-07/msg01155.html>

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- *From:* Sam Wormley <[swormley1@xxxxxxxxxx](mailto:swormley1@xxxxxxxxxx)>
  - *Date:* Wed, 18 Jul 2007 00:20:23 GMT
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dkomo wrote:

Bob Casanova wrote:

On Mon, 16 Jul 2007 19:34:00 -0500, the following appeared in talk.origins, posted by Slimebot McGoo <[olderthan@xxxxxxxxxx](mailto:olderthan@xxxxxxxxxx)>:

On Sun, 15 Jul 2007 13:53:58 -0600, dkomo <[dkomo871@xxxxxxxxxxxxx](mailto:dkomo871@xxxxxxxxxxxxx)> wrote:

Wouldn't it be fun to journey ahead  
4,000,000 years and see what becomes of the  
earth and the human race?

Actually, it is possible to do this without violating the laws of physics. What one needs is what is known as a "relativistic rocket". This is a ship that can accelerate at a constant one g indefinitely. Such a ship will reach 0.9 times the speed of light in about 0.9 years. As it gets closer and closer and closer to the speed of light, time on board the ship, known as "proper time", slows drastically relative to the outside world.

The details of such a journey are given here:

The Relativistic Rocket  
<http://math.ucr.edu/home/baez/physics/Relativity/SR/rocket.html>

As seen on the above page, such a ship could journey to the Andromeda galaxy and return, a total distance of 4,000,000 light years, in

Re: Time travel into the future

only 56 years of shipboard time, which is within a single human lifetime. Once it has gotten back to earth, 4,000,000 years will have passed.

Probably too soon to ask this, but how will it stop when it gets back?

The same way it braked and re-accelerated at Andromeda. Hell, if it can do it three times it can do it four.

Extra braking and acceleration take time and use up extra "fuel" (matter/energy). The best course to take is described here:

"If you wish to pass by a distant star and return to Earth, but you don't need to stop there, then a looping route is better than a straight-out-and-back route. A good course is to head out at constant acceleration in a direction at about 45 degrees to your destination. At the appropriate point you start a long arc such that the centrifugal acceleration you experience is also equivalent to earth gravity. After 3/4 of a circle you decelerate in a straight line until you arrive home."

The Relativistic Rocket

<http://math.ucr.edu/home/baez/physics/Relativity/SR/rocket.html>

This trajectory would require only one cycle of acceleration and braking.

--dkomo@xxxxxxxx

Curved routes just take more fuel... you can see that using an orthogonal coordinate system--calculate the acceleration along each axis.