

The Limitations of Space Travel

Why Can't We Find ET?

It is becoming more and more widely accepted among scientists that we shouldn't be asking *if* there is life on other planets but rather *where* is the life outside Earth.

Life as we know it requires a certain set of conditions to develop but with at least 100 billion galaxies in the universe, the odds are strongly against Earth being the only planet where

those can be found. And, of course, there is no guarantee that life on other planets would resemble life here and require the same conditions we do

(Kluger, 2016.) So, if there is life in a galaxy far, far away, why haven't we met them yet?



1. They're far, far away

"Space is big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the road to the chemist's, but that's just peanuts to space."

- The Hitchhiker's Guide to the Galaxy (Adams, 1979)

The distance between Earth and any other point in our solar system depends on where each is in its orbit around the Sun. Mars, to which NASA is hoping to send manned missions in the 2030s (Wilson, 2016), is approximately 56 million km from Earth at its closest point, 401 million km at its furthest (NASA, n.d.). With current technology, a one-way trip to the red planet takes around 8 months (Loff, 2012) and this is to a planet that, galactically speaking, is right next-door. The New Horizons mission to Pluto left Earth on 19 January 2006 and didn't reach its destination until 14 July 2015 (Talbert, 2015). And this is still just within our own solar system, in which no planet appears to have the necessary conditions to sustain life.

The closest rocky planet outside our solar system is known simply as HD 219134b and lies 21 light years away (Barnett, 2015). A light year is "the distance traversed by light in one year, about 5.88 trillion mi.

(9.46 trillion km)” (Dictionary.com, 2016). HD 219134b, unfortunately, lies too close to its sun to be habitable. A planet very similar to Earth was discovered by the Kepler spacecraft in 2015 but it lies

Reading Sample



This section has been removed

With Purchase



Google Access

Thank you for your purchase. Clicking the link button below will automatically create a copy of your resource inside your Google Drive. You'll find the file inside the 'Shared with me' section on the left side of your Drive.

Important: Before you click, make sure you're signed in to the Google account you'd like the resources placed into. If the resources are added to the wrong account, simply sign out and then into the correct one and repeat the process.

[Click here to place a copy directly into your Google Drive Account](#)

TWF

Another very serious concern is exposure to radiation because the protection of the Earth's atmosphere is gone. As on this planet, too much radiation can cause radiation poisoning and cancer. Time spent away from loved ones and the stress of a high-pressure job with no escape can also cause negative psychological effects. These issues are made worse if an astronaut is not getting enough sleep or if they are having problems with other mission members (Roberts, 2013). And, again, with longer flights these problems will increase. With current technology, the human body could not withstand a trip to another inhabitable planet.



Neil Armstrong

Looking to the future

Reading Sample

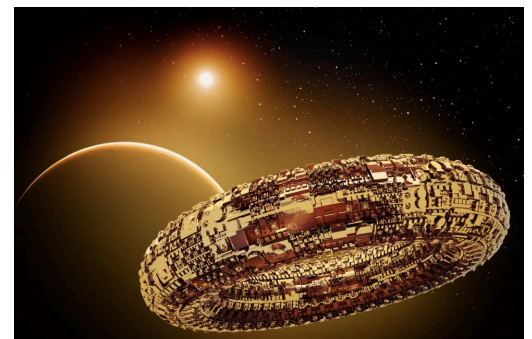


This section has been removed

With Purchase



Force fields to block radiation, space adapted plants for growing food, and water and oxygen recycling systems are also being looked at. To deal with the lack of gravity, a rotating, circular ship could create a sense of gravity for those onboard. For extreme distances, science fiction is inspiring some possible solutions. The warp drive that makes intergalactic travel possible on Star Trek is a notion physicists have been toying with for decades and theoretical physicist Miguel Alcubierre published a paper in 1994 that said it was theoretically possible. Another science fiction staple is suspended animation, which allows people to sleep through the hundreds or thousands of years required to reach their destination. In 2006, scientists at Massachusetts General Hospital were able to induce a reversible suspended animation in mice with hydrogen sulfide (Science Channel, n.d.).



A rotating ship to simulate gravity

Reading Comprehension Questions

1. Is
2. How
3. What is a light year?
4. Why
5. What two elements are combined in the space shuttle's fuel cells?
6. What
7. Name three negative impacts of space travel on the human body.
8. What

Extension Question:

9. You have been

Reading Sample



This section has been removed

With Purchase



Google Access

Thank you for your purchase. Clicking the link button below will automatically create a copy of your resource inside your Google Drive. You'll find the file inside the 'Shared with me' section on the left side of your Drive.

Important: Before you click, make sure you're signed in to the Google account you'd like the resources placed into. If the resources are added to the wrong account, simply sign out and then into the correct one and repeat the process.

[Click here to place a copy directly into your Google Drive Account](#)

TWF

References

1. Adams, D. (1979). *The hitchhiker's guide to the galaxy*. New York: Harmony Books.
2. Barnett, A. (2015, July 30). Nearest rocky planet outside our solar system found. CNN. Retrieved 23 March 2016 from: <http://www.cnn.com/2015/07/30/us/exoplanet-discovered/>.
3. Bray, N. (ed.) (2015, July 30). Space shuttle and international space station. Retrieved 23 March 2016 from: http://www.nasa.gov/centers/kennedy/about/information/shuttle_faq.html#14.
4. Dictionary.com. (2016). Light year. Retrieved 23 March 2016 from: <http://www.dictionary.com/browse/light-year?s=t>.
5. Kluger, J. (2016, February 22/29). The perfectly sane case for life in space. *Time*.
6. Loff, S. (ed.) (2012, October 10). Mars planning frequently asked questions. Retrieved 22 March 2016 from: <http://www.nasa.gov/offices/marsplanning/faqs/>.
7. National Aeronautics and Space Administration. (2002, April 7). Fuel cell power plants. Retrieved 23 March 2016 from: <http://spaceflight.nasa.gov/shuttle/reference/shutref/orbiter/eps/pwrplants.html>.
8. National Aeronautics and Space Administration. (n.d.) Mars: FAQ. Retrieved 22 March 2016 from: <http://solarsystem.nasa.gov/planets/mars/faq>.
9. Roberts, J. (ed.) (2013, August 21). How astronauts are affected by space exploration. Retrieved 24 March 2016 from: http://www.nasa.gov/externalflash/HRP_Feature/.
10. Science Channel. (n.d.). 10 technological innovations needed for deep space exploration. Retrieved 23 March 2016 from: <http://www.sciencechannel.com/topics/aliens-space/10-technology-innovations-needed-for-deep-space-exploration/>.
11. Talbert, T. (ed.) (2015, August 24). New Horizons: The first mission to the Pluto System and the Kuiper Belt. Retrieved 23 March 2016 from: https://www.nasa.gov/mission_pages/newhorizons/overview/index.html.
12. Wilson, J. (ed.). (2016, February 9). Journey to Mars overview. Retrieved 22 March 2016 from: <http://www.nasa.gov/content/journey-to-mars-overview>.