

Is there another planet out there like Earth?

In recent years, astronomers have discovered a variety of worlds around other stars, but have not encountered a planet remotely like our own. Our instruments most likely are not sensitive enough to make such a detection. But wait!! This may soon change. NASA is launching a mission called Terrestrial Planet Finder, a space telescope specifically designed to detect another Earth. The odds are favorable that a survey of approximately 150 nearby stars will reveal at least one small, Earth-like planet.



If such a discovery is made, what will be the next step? Will we, like Columbus, long to travel to the new world? Let's do some computations to see what we are facing. (Please express answers in scientific notation)

Light travels at a speed of 1.86×10^5 miles per second.

A "light year" is the distance that light travels in one year.

1. Alpha Centauri, which lies 4.4 light years away, is the closest star system. It would be a good candidate for discovering an Earth-like world. The distance to Alpha Centauri is 3,000 times farther than any space probe has ever traveled.

In miles, how far is the journey to Alpha Centauri? _____

In miles, approximately how far has the furthest space probe traveled? _____

2. The star 55 Cancri, which has three large planets similar to those in our solar system, is 10 times more distant than Alpha Centauri.

In miles, how far is the journey to 55 Cancri? _____

Traveling at the speed of light, how long would a journey to 55 Cancri take (in years)? _____

3. Robert Frisbee, an engineer who directs advanced propulsion concepts studies at NASA's Jet Propulsion Laboratory in Pasadena, California, is attempting to find a way to master interstellar travel. He is studying five distinct propulsion technologies that could get an astronaut from here to Alpha Centauri in less than 50 years.

In miles per second, how fast would the space ship be traveling if the journey to Alpha Centauri is accomplished in 50 years? (assuming a constant speed) _____

4. The star Sirius is 81 trillion kilometers away. In miles, how far is a journey to Sirius?
(1 km = 0.62 mi) _____

Traveling at the speed of light, how long would a journey to Sirius take (in years)? _____

5. Mars is 78 million kilometers from Earth. It has been estimated that the journey to Mars would take 5 years. How fast, in miles per second, would the space ship be traveling to arrive on Mars within 5 years? _____