

How to survive the end of the world

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Introduction

The end of the world has come and we have to move. We are going to Luyten B because it has everything life needs. We have technology to get there and therefore, it is safe for mankind to colonise this new planet.



The universe

- This name describes the collection of matter, energy and space that exists.
- Its creation is not fully understood.
- Common excepted theory is the Big Bang Theory - the Big Bang created a huge fireball which cooled and formed into tiny particles called matter.
- Everything in the universe is made of matter.
- Universe is enormous, the distances are measured in light years.
- One light year=9.5 trillion km, light travels an impressive 300,000 kilometers a second.
- Huge collections of stars are called galaxies.

What you can find in space

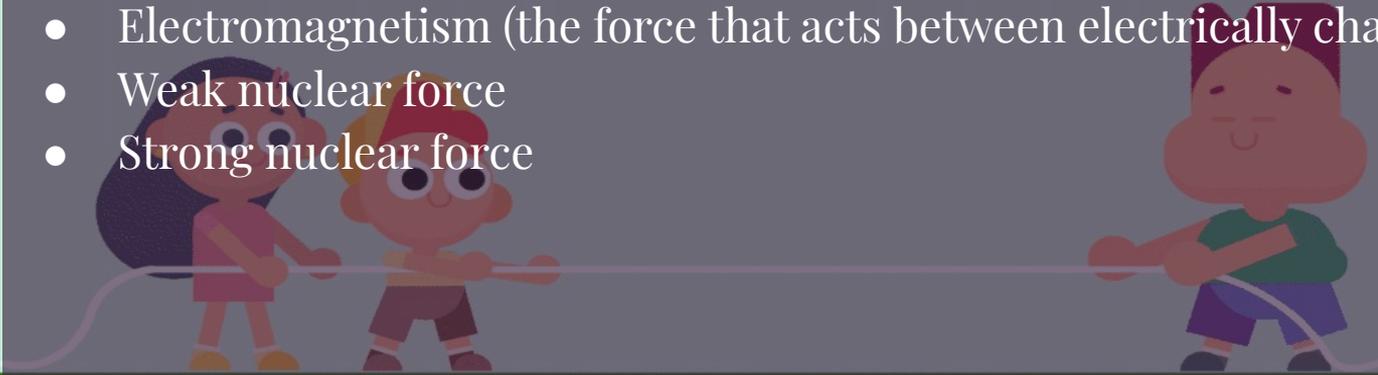
A composite image of space. In the center is a large, detailed view of the Earth showing continents and clouds. To the left, a bright sun or star is partially visible, creating a lens flare. To the right, a comet with a long tail is streaking across the sky. The background is a deep blue space filled with numerous stars of varying colors and sizes.

- Stars
- Planets
- Asteroids
- Moons
- Comets
- Black holes
- Meteorites and other space debris

There are billions of these objects, 85% of the universe is still dark matter.

Main forces in space

- How do objects in space work?
- All matter particles interact with each other by four main forces:
- Gravity (a force that pulls things together)
- Electromagnetism (the force that acts between electrically charged particles)
- Weak nuclear force
- Strong nuclear force

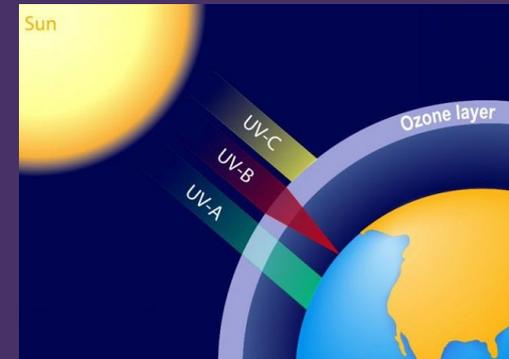
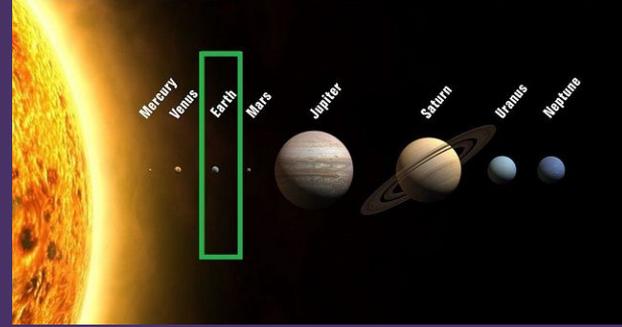


How Earth sustains life

These are the main factors that make living on Earth possible:

- Distance of the Earth from the Sun.
- Importance of light on the Earth.
- Importance of Earth's Atmosphere with its Ozone layer.
- Magnetic field that protects Earth from solar radiation.
- Favourable Climatic Condition.
- Right chemical ingredients for life, e.g. Water and carbon. Carbon is the organic material that make cells and structures and by that carries out life processes.
- Earth's gravitational pull.

By knowing this, we can find the right exoplanet to live on.



Finding Earth-like exoplanets

Exoplanets are planets that are not in our solar system.

- Exoplanets are planets that orbit a star other than our sun.
- Astronomers have confirmed more than 4,000 exoplanets orbiting distant stars.
- Most planets are found via the *transit method*. Exoplanet transits happen when they pass between their stars and Earth.
- Other planets are found via the *wobble method*.
- As a planet orbits a star, the star wobbles. Scientists can notice this wobble and that way find out about the planet, as the star wouldn't wobble if there were no planets orbiting around it. The wobbling is caused by the star and the exoplanet pulling on each other by gravity.

Where are we going to go?

We are going to go to Luyten b.

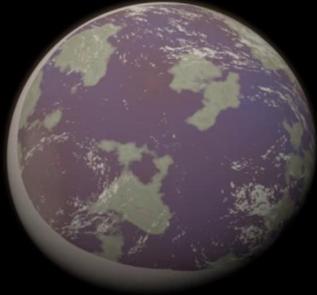
- Luyten b is the 5th closest potentially habitable exoplanet.
- It is app. 12 light years (or 115.4 trillion km) away and since we are going at the speed of light we will be there well... in 12 years.
- There could be life, it is very similar to Earth.
- Water can be in a liquid form there and it probably has an atmosphere.
- Luyten b orbits quite close to its sun.
- Luyten b is one of the most Earth-like exoplanets ever found.

More about Luyten b

- There are only 19 days in one year.
- It is most likely a rocky planet.
- Luyten b is only 2.89 times the mass of Earth.
- The half of Luyten b is covered with ice.
- Luyten b receives 6% more starlight than Earth.
- It's average temperature is 19 degrees Celsius.

Luyten's b Vs Earth

Luyten's b, GJ 273b



Earth



Luyten b

How will we get there?

- All the people will gonna have to be moved, so we decided to first send a small fleet of spaceships to explore the planet and prepare it for colonization.
 - Then we will send a second, bigger fleet of ships, which will prepare the planet even more.
 - Then a few more big fleets will come, with the rest of the people and animals and plants.
 - But you have nothing to worry about, as the rockets will be colossal, so you'll always have a personal space of at least 10 square meters.
 - There will be spas, gyms, canteens, gardens, supermarkets and more.
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- And as we know from Newton's first law of motion, every moving thing will continue to move in the same direction and speed 'till something stops it, so our spaceship has special rotatable nozzles to help it change direction and land safely.



The fleet

One fleet will consist of:

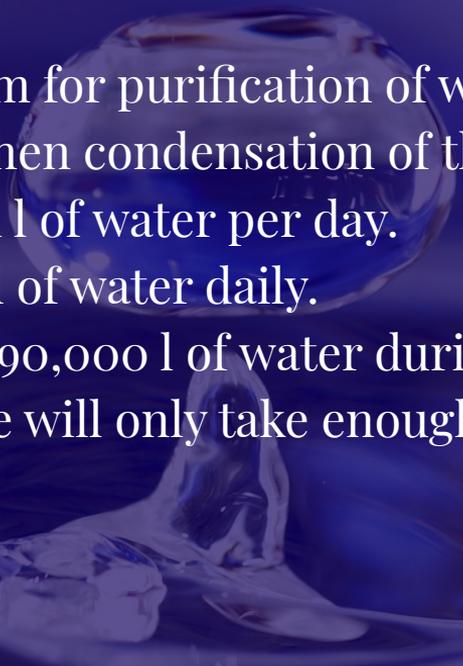
- 10 motherships, each carrying 500 people (You will go here)
- 5 exploratory ships
- 20 resource ships (to carry all we need)
- 40 protective ships (to help us not crash into anything)



The food

- The resource spaceships will have ginormous food storages, filled to the brim with food.
- They will also have huge fields with all kinds of fruits and vegetables and huge farms to keep the meat storage full.
- You can cook your own food in the kitchens or go to the canteen.
- An average person eats 0.83 kg of food per meal, i.e. 2.49 kg per person per day.
- 500 people would eat 1245 kg of food per day, and they'd eat 5 453 100 kg of food during the journey, which takes 12 years.

Water



- We have a recycling system for purification of water.
- We use evaporation and then condensation of the steam back to water.
- An average person uses 11 l of water per day.
- 500 people will use 5,500 l of water daily.
- They will use around 24,090,000 l of water during the journey, but as 95% of the water is recyclable, we will only take enough water for one year i.e. 2,007,500 l.

How the spaceship creates oxygen

- We will create oxygen by planting trees and other oxygen-making plants.
- Plants create oxygen by a process called photosynthesis.
- Plants need sunlight to survive.
- As we are going away from our sun, we will have man-made sunlight for the plants.
- We will have plants everywhere on the spaceship, so there will be an Earth-like climate on the ship.



Gravity

- We have 2 gravitational fields: one is 4.6 G, about average for the floors and the second one is 2,714,285,714,290 G.
- Just enough against the speed of light aka hyperspace to make it feel normal.
- The Gs pull you back but the gravity from the front side will be pushing you forward with enough force to make it feel normal after some time.
- We will put the front gravity away the millisecond we leave hyperspace.
- We have the highest reflex to command bots that leave hyperspace and simultaneously remove the artificial gravity.

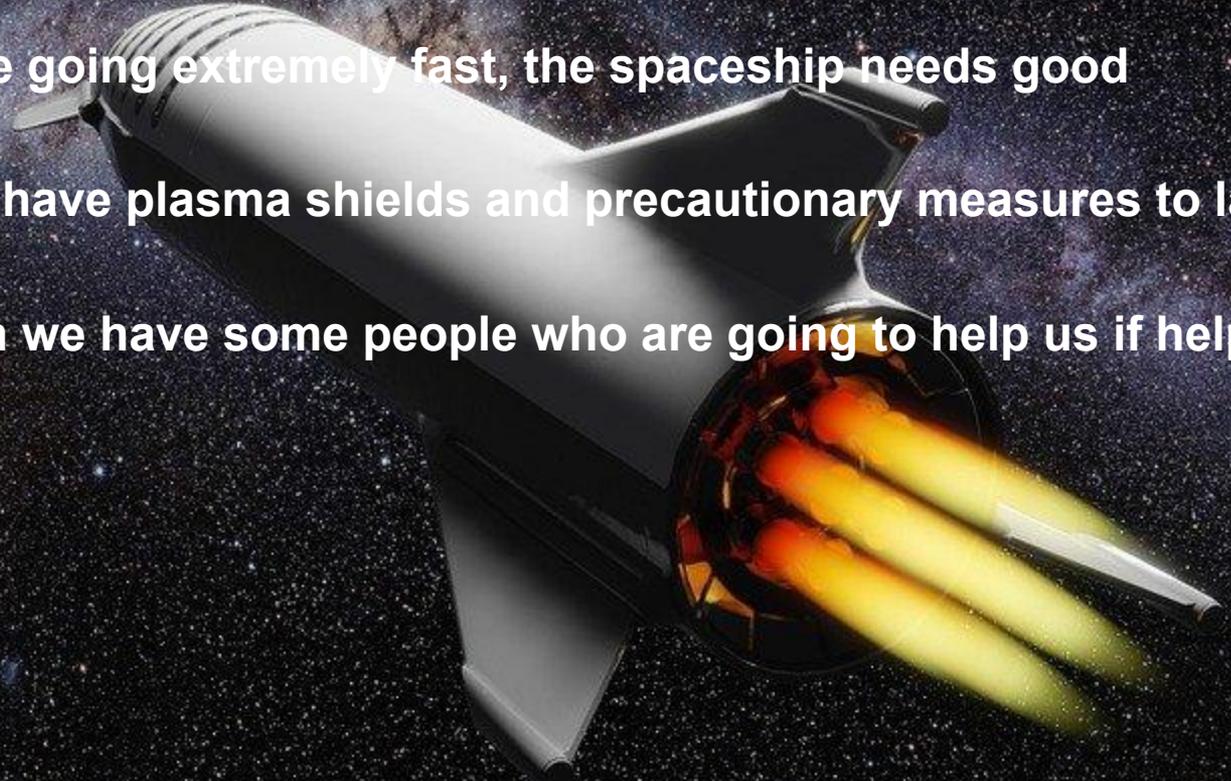


Our spaceships' fuel

- **The matter-antimatter fusion engine is the most effective propulsion system.**
- **It's very powerful - 100% of the matter and antimatter is turned into energy**
- **You need less fuel to produce more energy. Therefore, it's more ecological.**
- **With less fuel, you have more space for the crew and cargo.**
- **This fuel can be made straight on the ship by having an excelerator on board.**
- **It is very dangerous, but it is worth the risk.**
- **That's why only highly trained personnel with special anti-radiation suits can enter the excelerator room.**

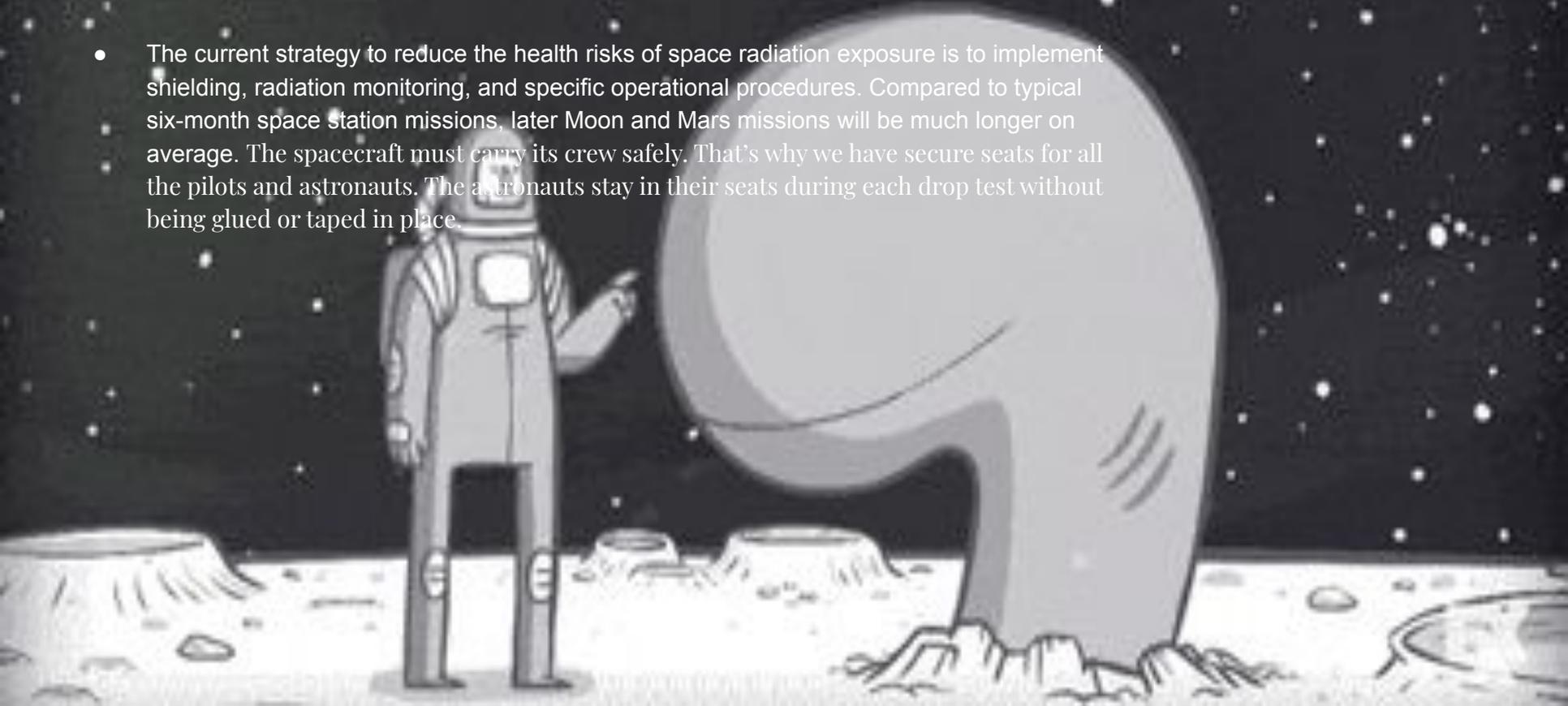
How is our spaceship kept safe

- Since we are going extremely fast, the spaceship needs good protection.
- Luckily, we have plasma shields and precautionary measures to land safely.
- And at Earth we have some people who are going to help us if help is needed.



How are our people kept safe

- The current strategy to reduce the health risks of space radiation exposure is to implement shielding, radiation monitoring, and specific operational procedures. Compared to typical six-month space station missions, later Moon and Mars missions will be much longer on average. The spacecraft must carry its crew safely. That's why we have secure seats for all the pilots and astronauts. The astronauts stay in their seats during each drop test without being glued or taped in place.





Welcome aboard!