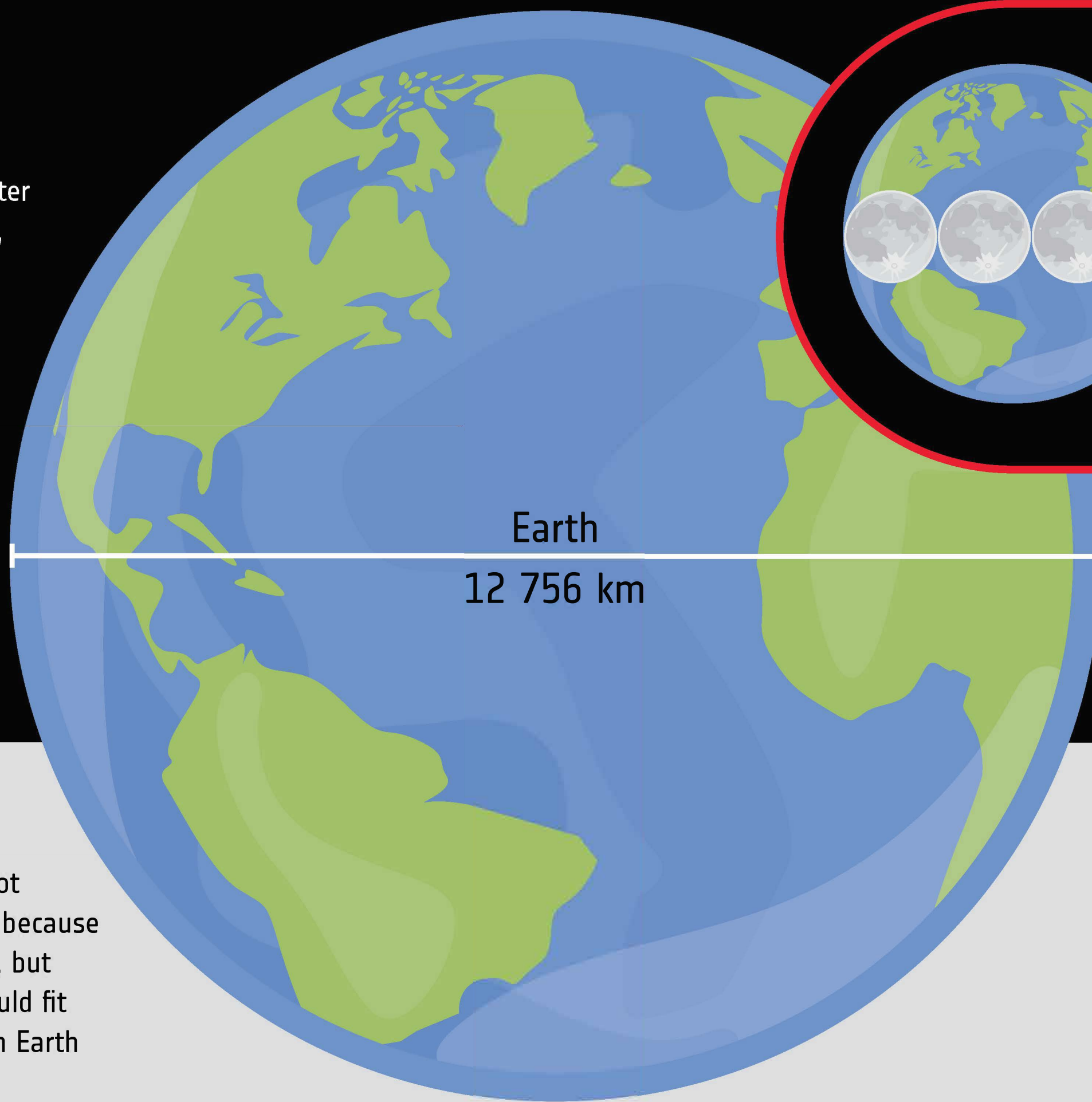


# MOON FACTS

## Size

The Moon is about one-quarter the size of Earth in diameter, but around 50 times smaller in volume.



## Distance

The distance from Earth is not always the same – it varies because the lunar orbit is not circular, but elliptical. On average, you could fit our planet 30 times between Earth and the Moon.

Closest: 356 400 km

Farthest: 406 700 km



# → 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

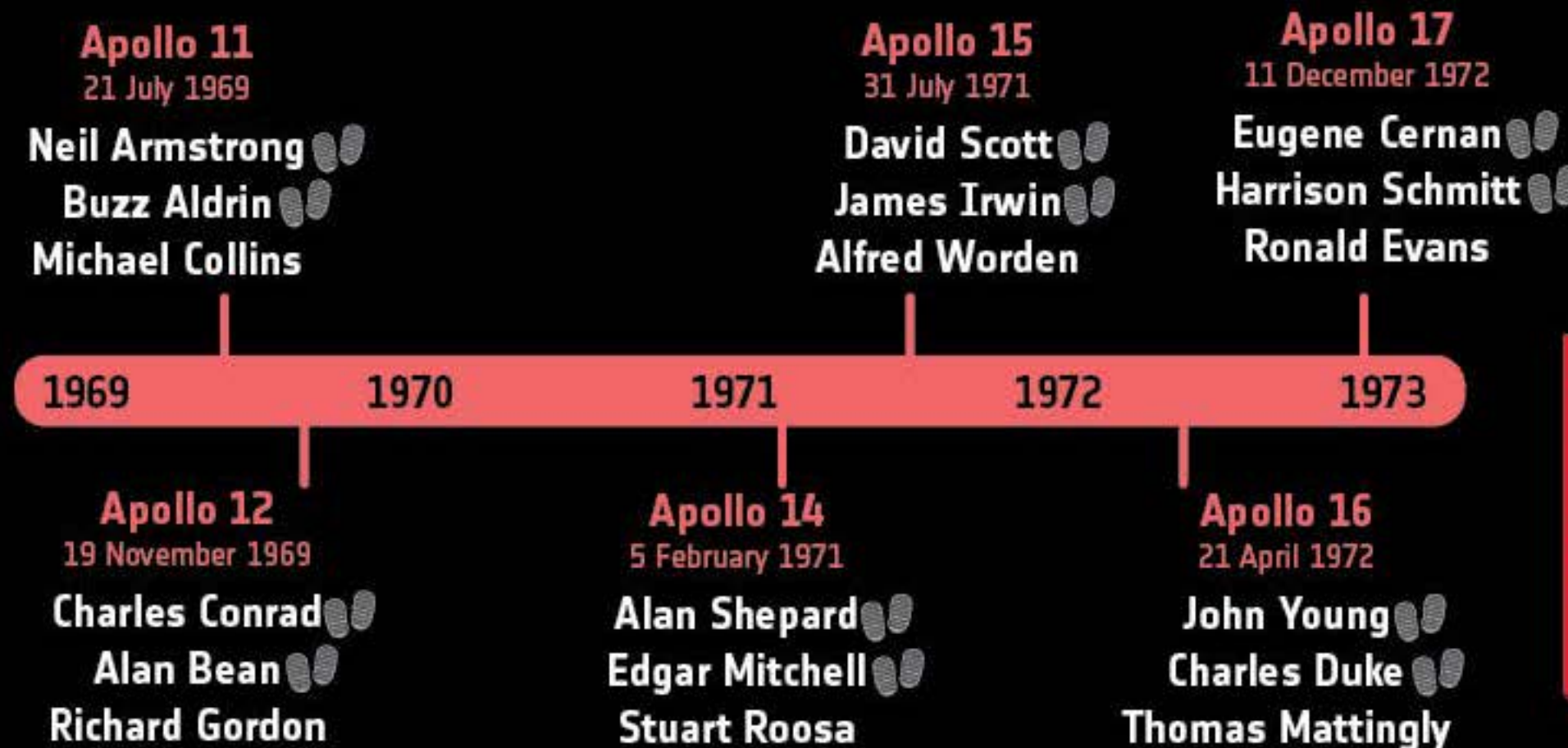
## 1. Moonwalkers



**Twelve people** walked on the Moon between 1969 and 1972.



They left **scientific experiments** on the surface and came back to Earth with nearly **400 kg of lunar rocks and soil**.

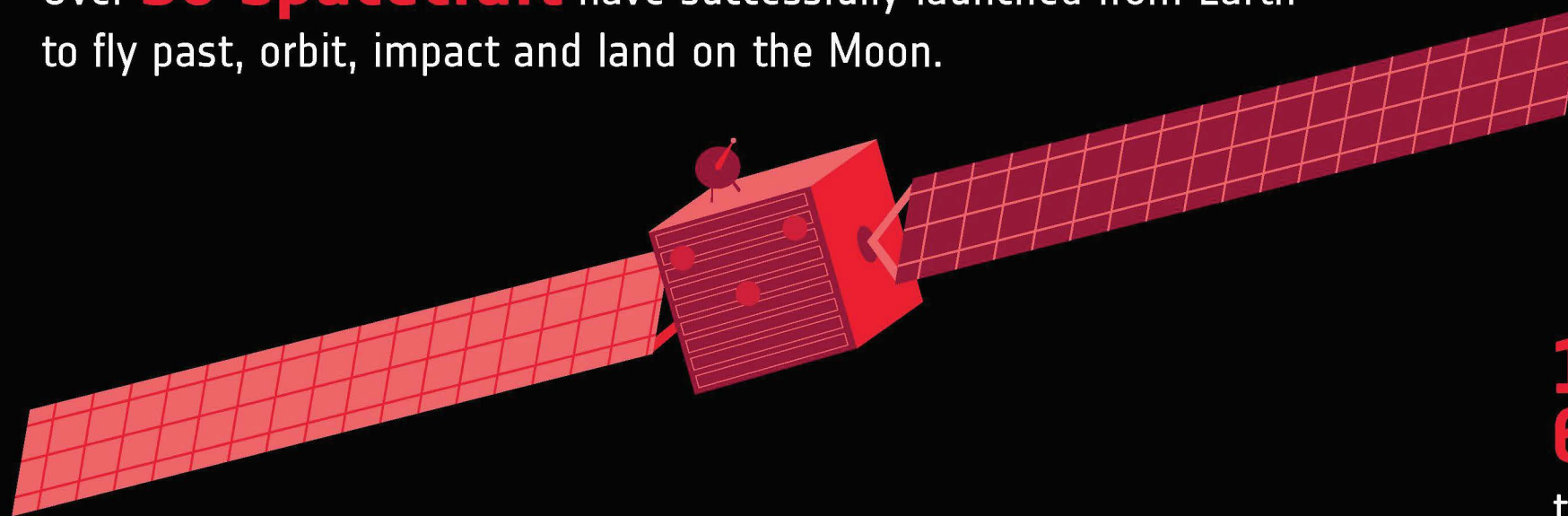


ESA is looking with international partners to **bring back more rocks** from the Moon using robots as part of the Heracles mission.

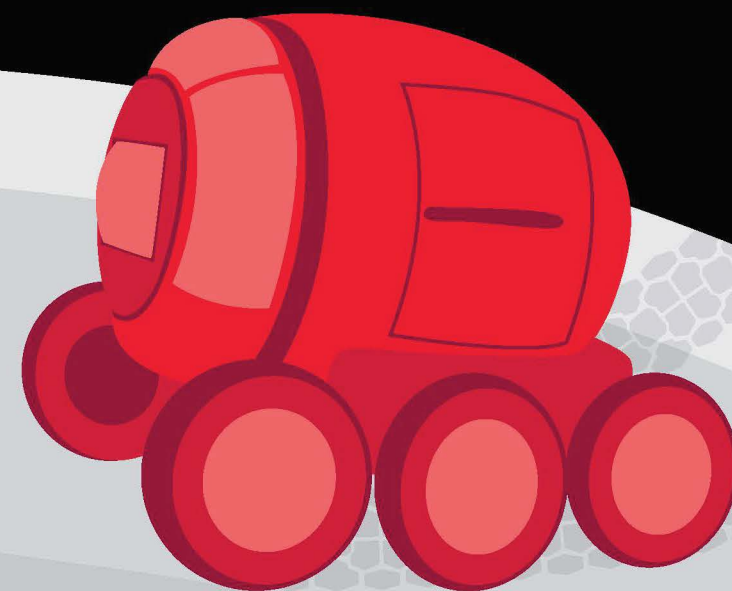
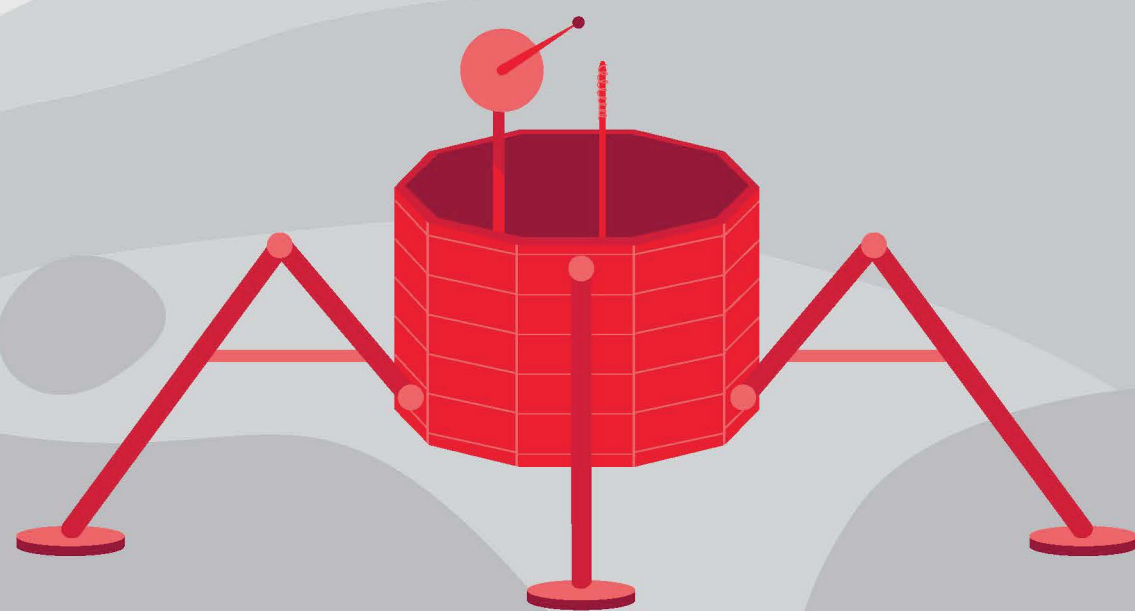
# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 2. **Spacecraft, landers and rovers**

Over **50 spacecraft** have successfully launched from Earth to fly past, orbit, impact and land on the Moon.



**19 landers** and **6 rovers** have visited the lunar surface.



ESA's next **hardware to land on the Moon** is on the Russian Luna-25 lander.

# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 3. Travel time

The time to get from Earth to the Moon depends on the **trajectory and propulsion system** of the spacecraft.

Apollo missions took about **three days** to reach the Moon.

The **quickest trip** was NASA's New Horizons mission – it flew past the Moon in just **8 hours and 35 minutes** on its way to Pluto.

ESA's first mission to the Moon, SMART-1, was the second spacecraft to use **ion thrust** technology. It took one year to reach the Moon using solar-electric propulsion.

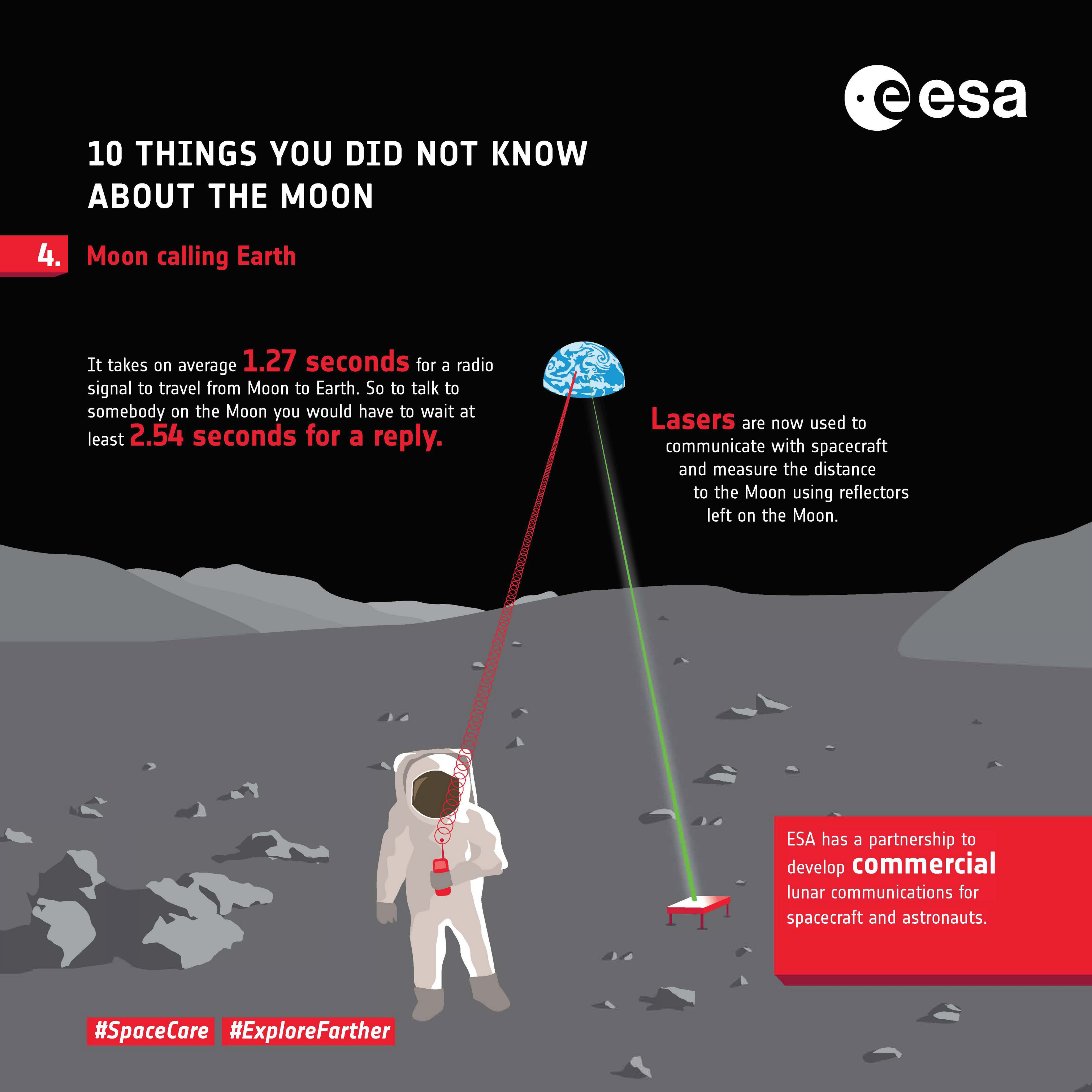
# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 4. Moon calling Earth

It takes on average **1.27 seconds** for a radio signal to travel from Moon to Earth. So to talk to somebody on the Moon you would have to wait at least **2.54 seconds for a reply.**

**Lasers** are now used to communicate with spacecraft and measure the distance to the Moon using reflectors left on the Moon.

ESA has a partnership to develop **commercial** lunar communications for spacecraft and astronauts.



## 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

### 5. The Moon is drifting away from Earth!

The Moon is slowly moving away from Earth, about **4 cm farther away each year.**



Gravity and tidal forces between these two celestial bodies are **slowing down the rotation of Earth** and increasing the distance from each other.



Missions to the Moon will help us understand **how it was created** and learn more about its orbit.

# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 6. Dangerous lunar dust

Lunar dust is made of sharp, abrasive nasty particles, but it is yet unknown **how toxic** it is for humans.

From sneezing to nasal congestion, all 12 people who have stepped on the Moon described **symptoms similar to hay fever.**

### ESA research

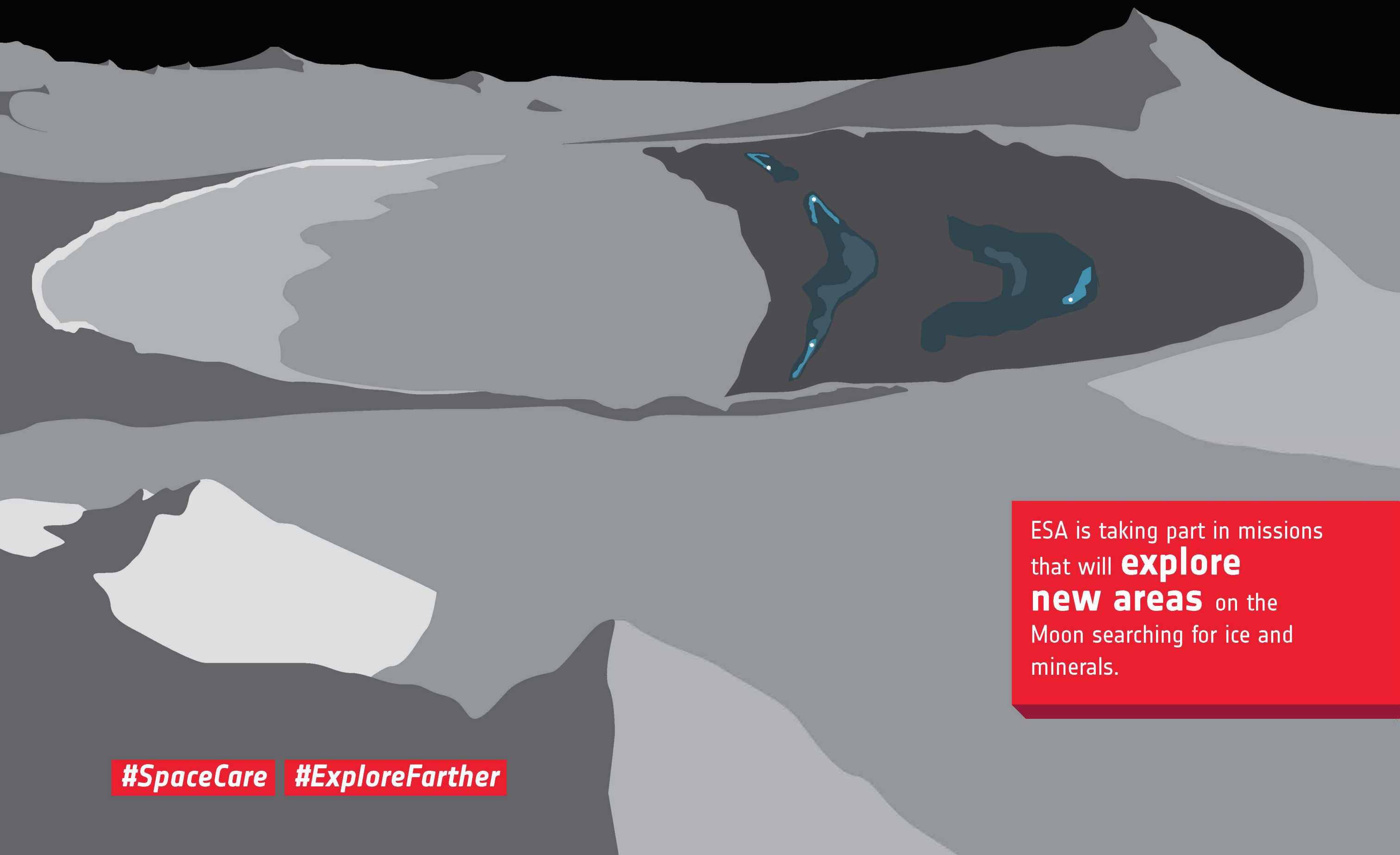
on the International Space Station is helping understand lung health in space.



## 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

### 7. There is scientific evidence for water on the Moon

Scientists have measured the **presence of water** in the Cabeus crater on the Moon by smashing a spacecraft into it and measuring the chemicals that were ejected.

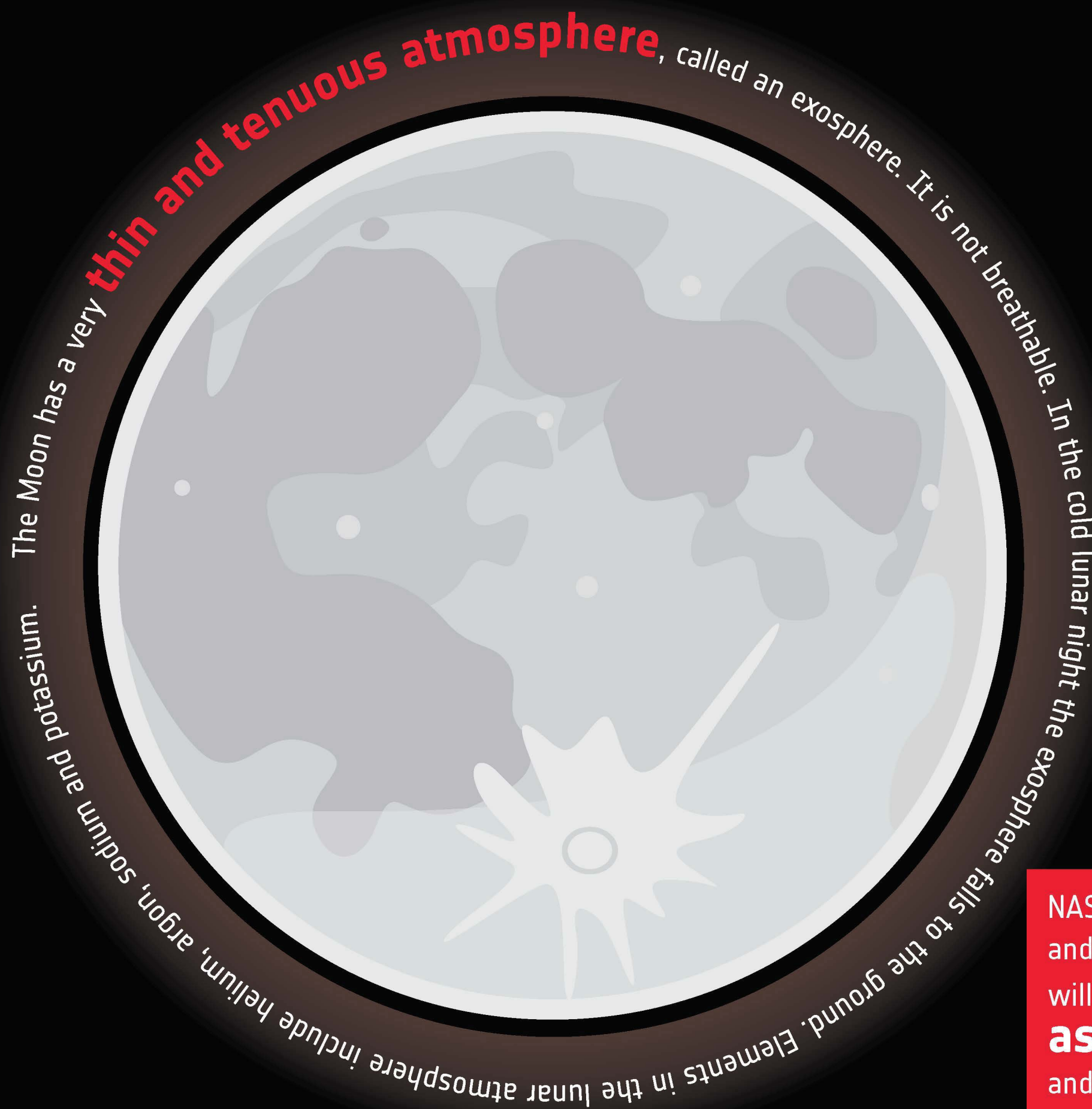


ESA is taking part in missions that will **explore new areas** on the Moon searching for ice and minerals.



# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 8. The Moon has an atmosphere



NASA's Orion spacecraft and ESA's Service Module will carry up to **four astronauts** close to and beyond the Moon.

# 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

## 9. Resources on the Moon

### Helium-3

Non-radioactive isotope for nuclear energy

$^3\text{He}$

### Hydrogen

Propellant to power rockets

H

### Water ice

Can be split a hydrogen and oxygen for fuel

Sunlight  
Solar energy

ESA's concept mission 'in-situ resource utilisation' is considering options to **find and use** these resources on the Moon.

## 10 THINGS YOU DID NOT KNOW ABOUT THE MOON

### 10. Moon flashes

Every few hours, **brilliant flashes of light** can be seen through a telescope across the lunar surface – the result of a meteorite striking our rocky neighbour at great speed.



These impact flashes are called **'transient lunar phenomena.'**

ESA monitors space debris and lunar flashes using **ground stations** on Earth.

# MOON FACTS

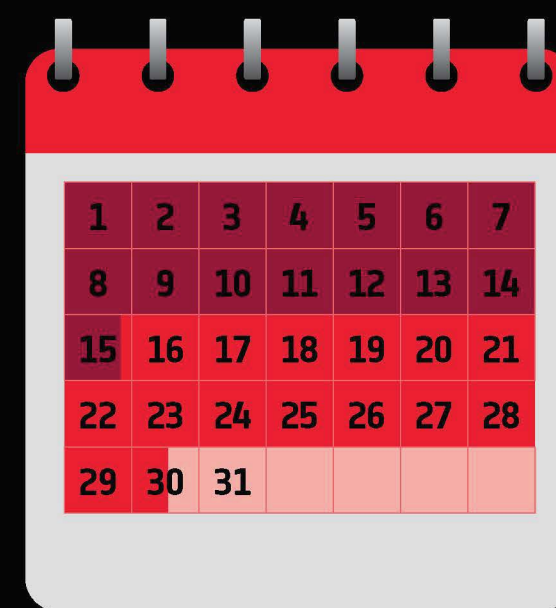
## Age

The Moon is believed to be around 4.5 billion years old, born from a giant collision of a Mars-sized object with the young Earth early in the Solar System's 4.6 billion year history.

**4.5  
billion years**

## Composition

The surface of the Moon is mostly made of oxygen, silicon, magnesium, iron, calcium, aluminium and titanium. At its centre there may be a small, molten iron core.



## Colour

The surface of the Moon is quite dark. The colour of the lunar landscape is mostly charcoal-grey. The Moon reflects the light of the Sun.

Seen from Earth, the atmosphere scatters certain wavelengths of light. When the Moon is close to the horizon, it often looks reddish. As it goes higher in the sky and is less obscured by the atmosphere, the Moon appears more yellow.



## A day on the Moon

The Moon takes around 29.53 Earth days to rotate once on its axis. So if you lived on the Moon you would experience about two weeks of day and two weeks of night.

# MOON FACTS



## Gravity

On the Moon a person would weigh six times less than they do on Earth. This is because the Moon has one sixth the gravity of Earth.

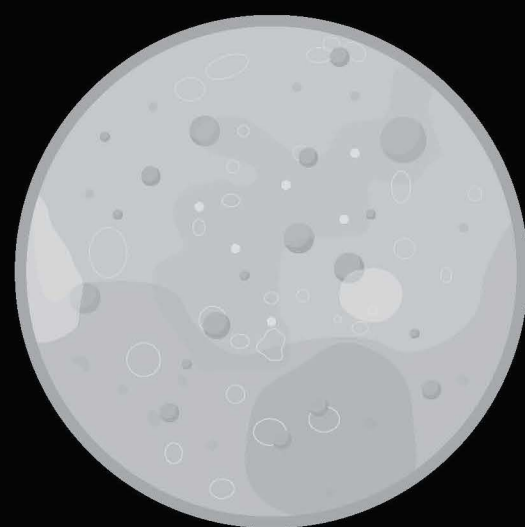


## The far side of the Moon

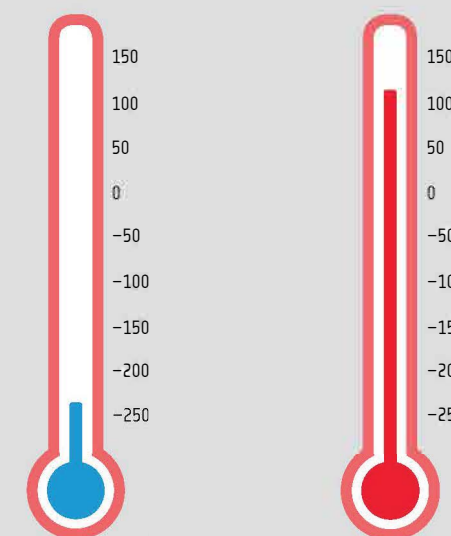
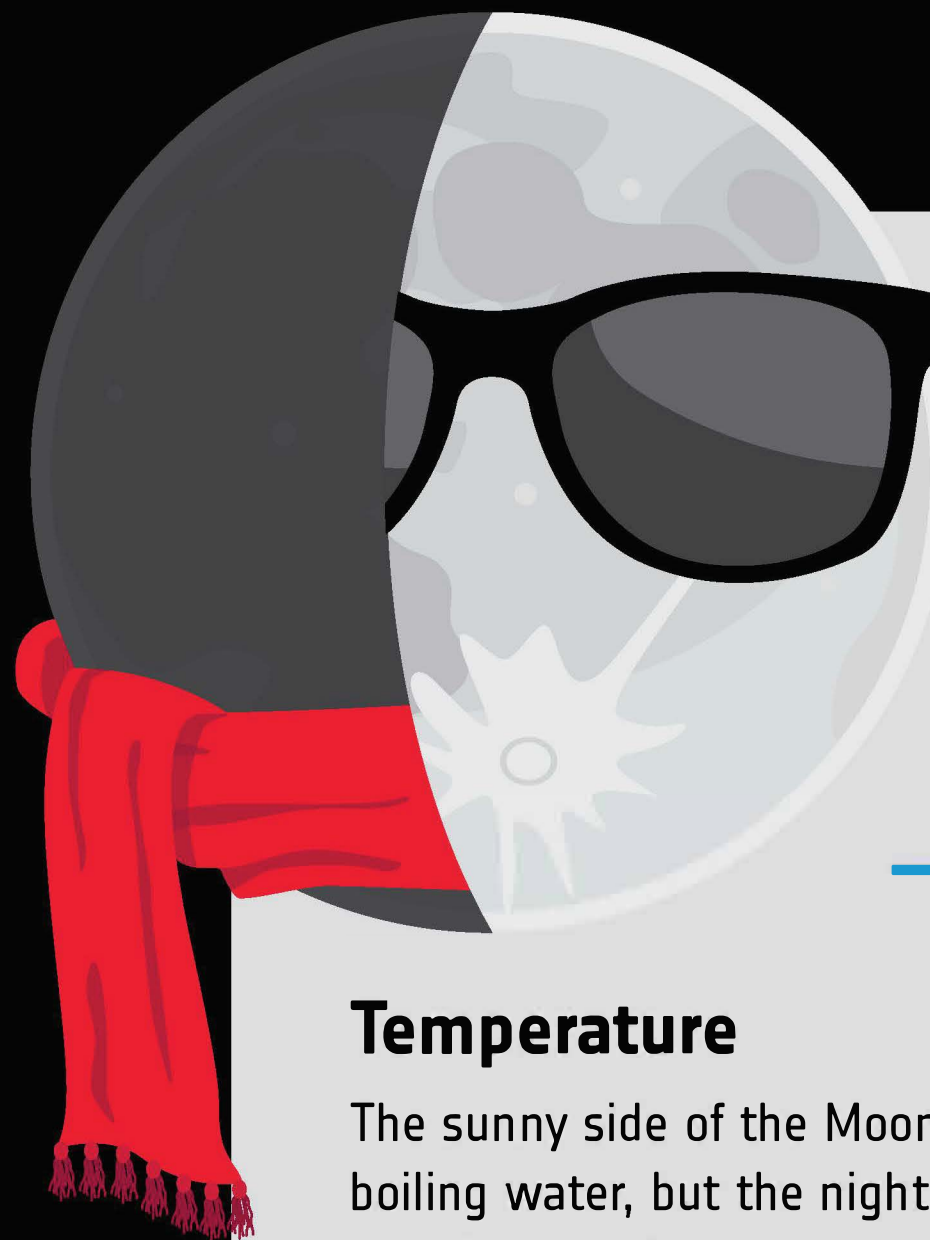
We call the side that is not visible from Earth the far side of the Moon, and it is also illuminated by the Sun at different times. The Moon takes as long to rotate on its axis as it takes to revolve around Earth, so we only see one 'face' of the Moon from our planet.



Near side



Far side



**-233 °C**   **123 °C**

## Temperature

The sunny side of the Moon is hotter than boiling water, but the night side is colder than anywhere on Earth. Lunar temperatures vary from 123 °C in the day and down to -233 °C in permanently shadowed polar craters.