THAU Sant Cugat

Artemis: Going Back to the Moon

MIT Edgerton Center

Why on earth do we want to go to the moon?

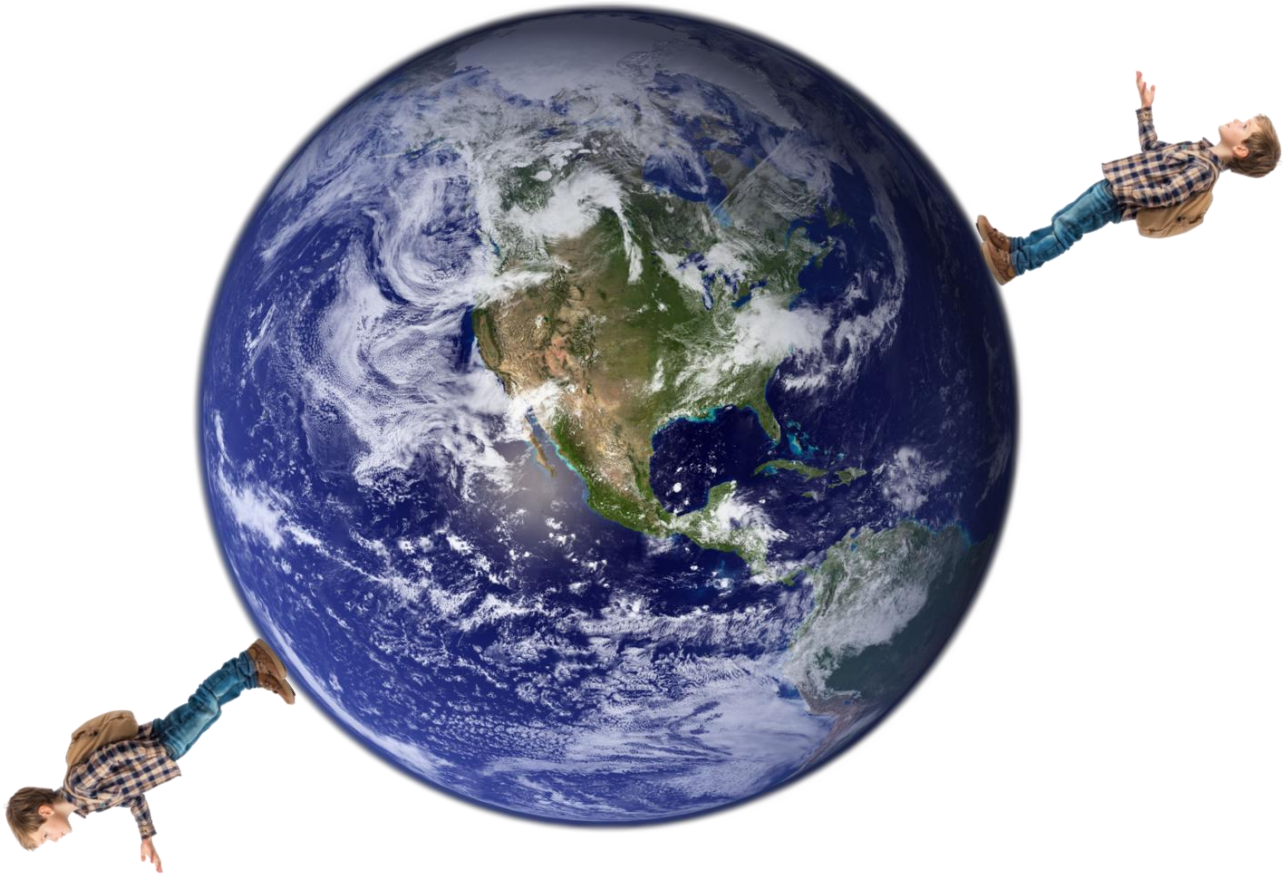

NOVA TOTIUS TERRARUM ORBIS GEOGRAPHICA AC HYDROGRAPHICA TABULA auct. Guilhelmo Blaeuw
QUATUOR ELEMENTA
IGNIS
AQUA
TERRA
QUATUOR ANNI TEMPESTATES
VER
AUTUM
AMERICA
MARE PACIFICUM
MAGALLANICA
TERRA AUSTRALIS INCOGNITA
ZONA TORRIDA
ZONA TEMPERATA
ZONA FRIGIDA

Let’s talk physics

How does the moon stay “in orbit”?


Earth
Artemis II - Orion Integrity
Moon

What is gravity?



How do we get there?

What is a rocket?

Us vs Gravity

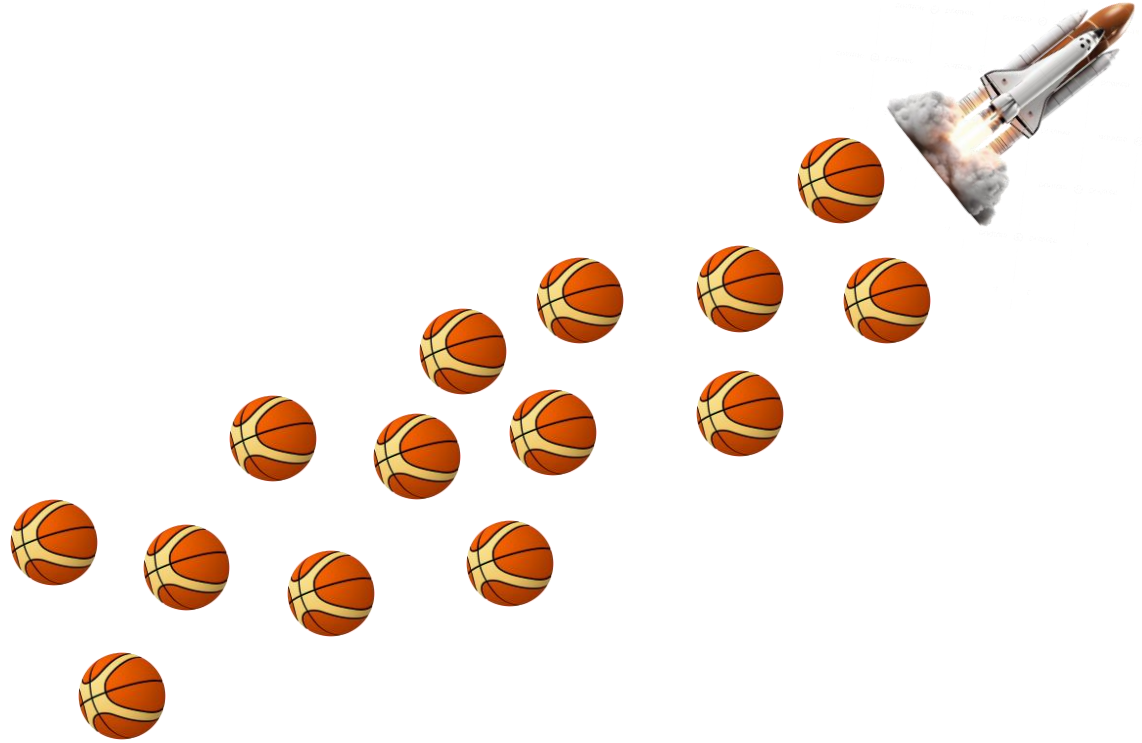
Us vs Gravity

Us vs Gravity

Us vs Gravity

Newton’s Third Law

Us vs Gravity

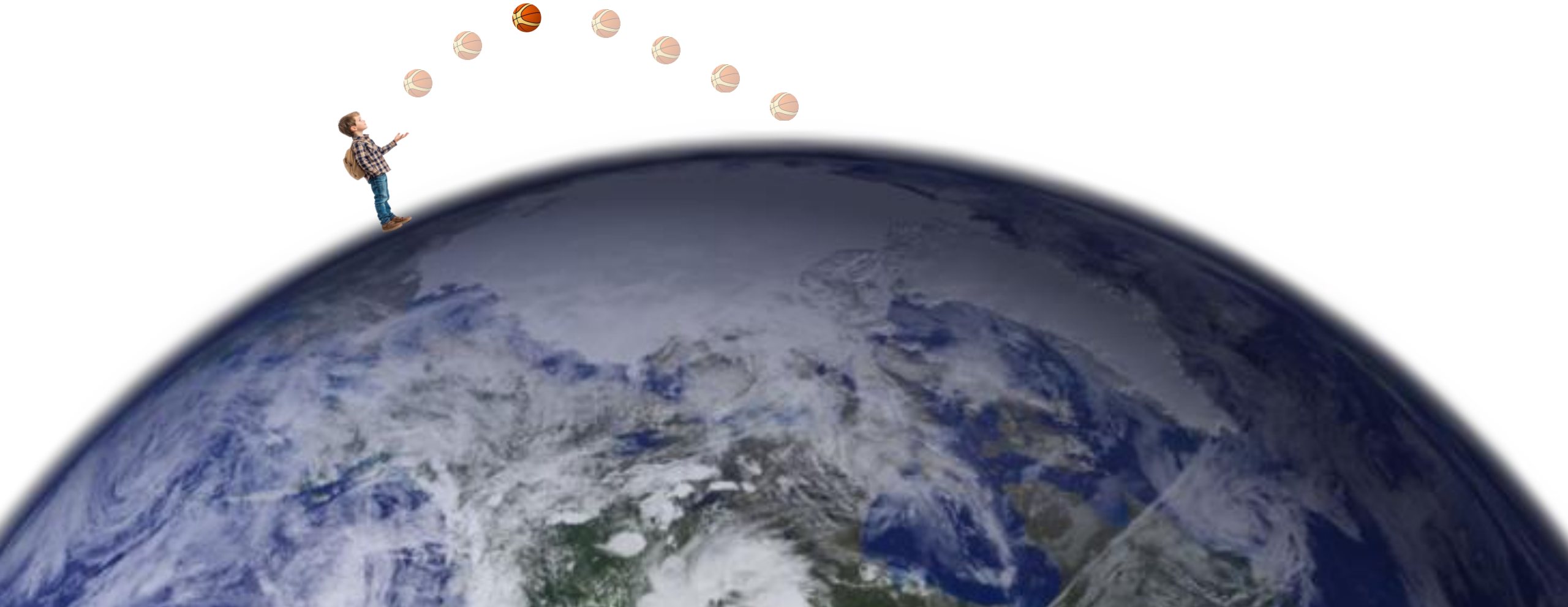


Newton’s Third Law

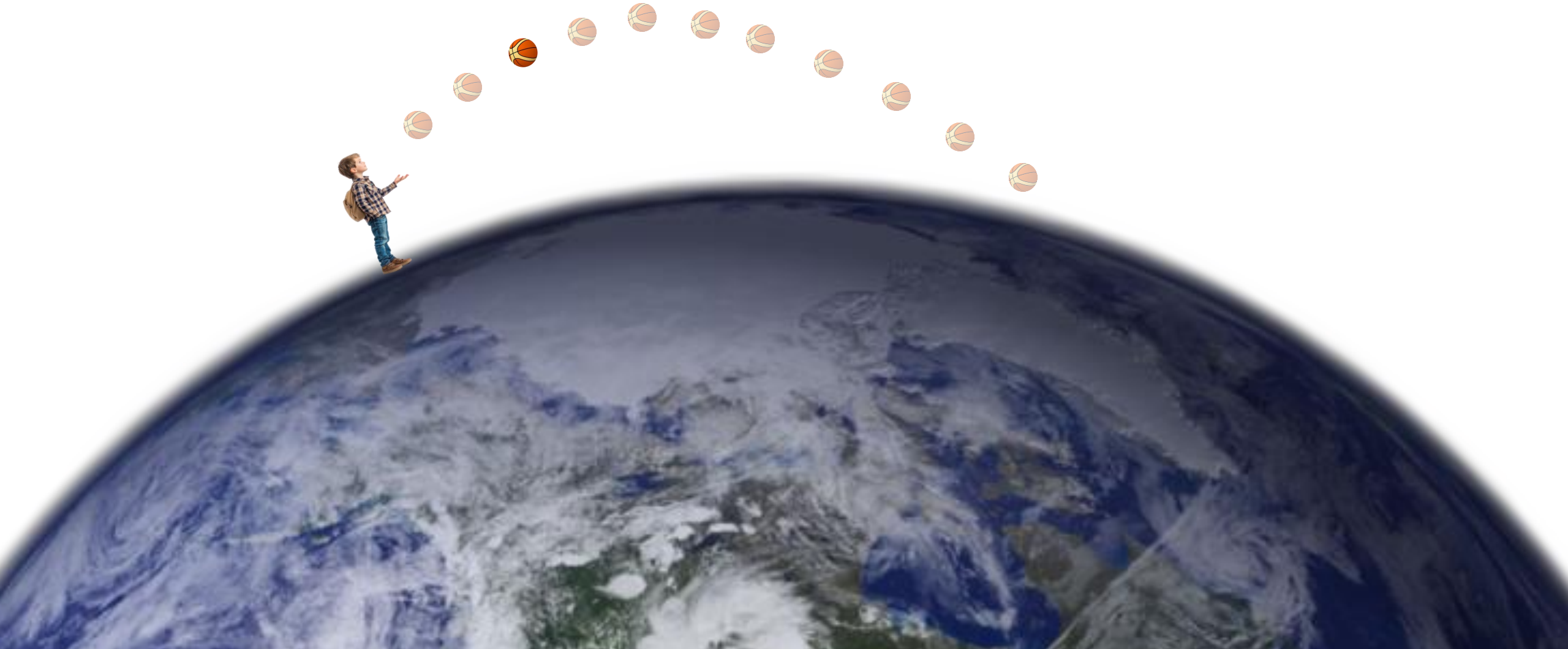
How do we orbit?

What is Orbit?

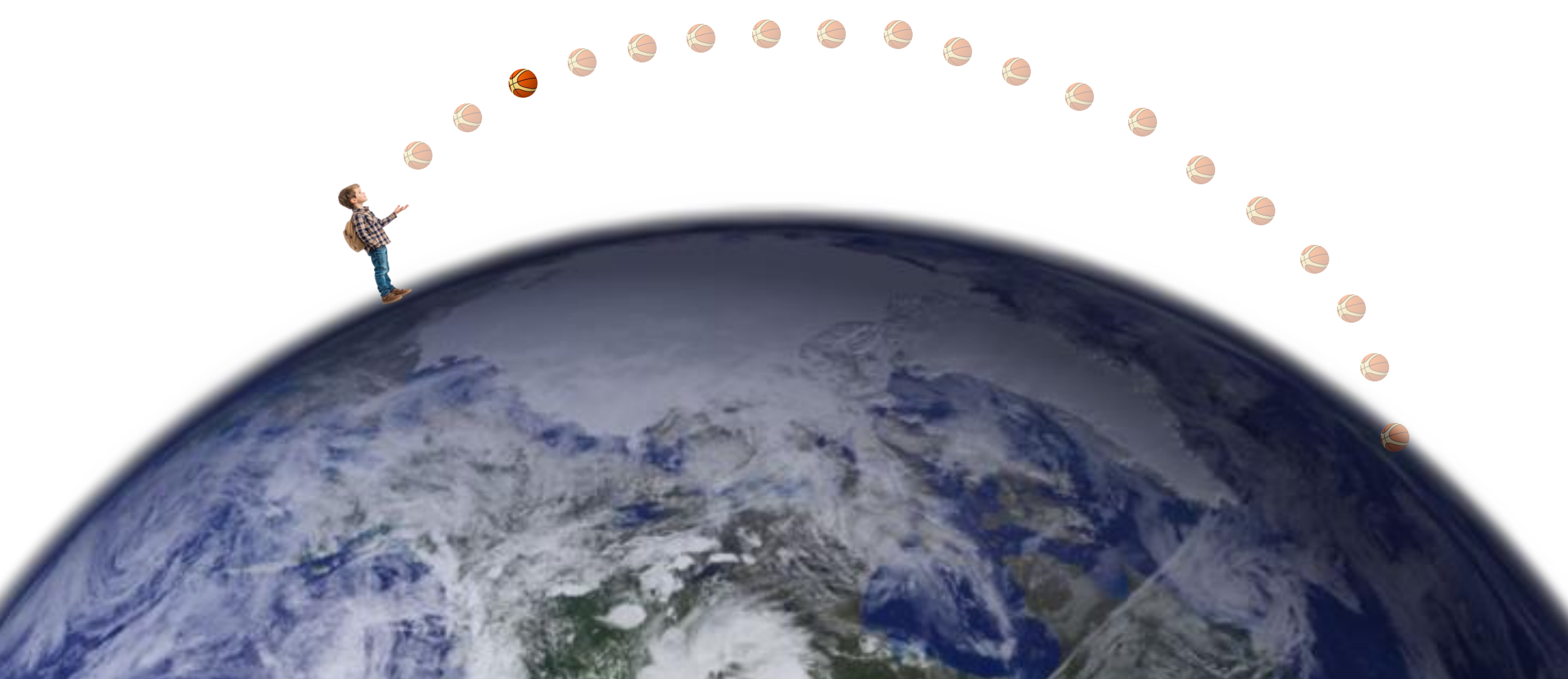
What is Orbit?



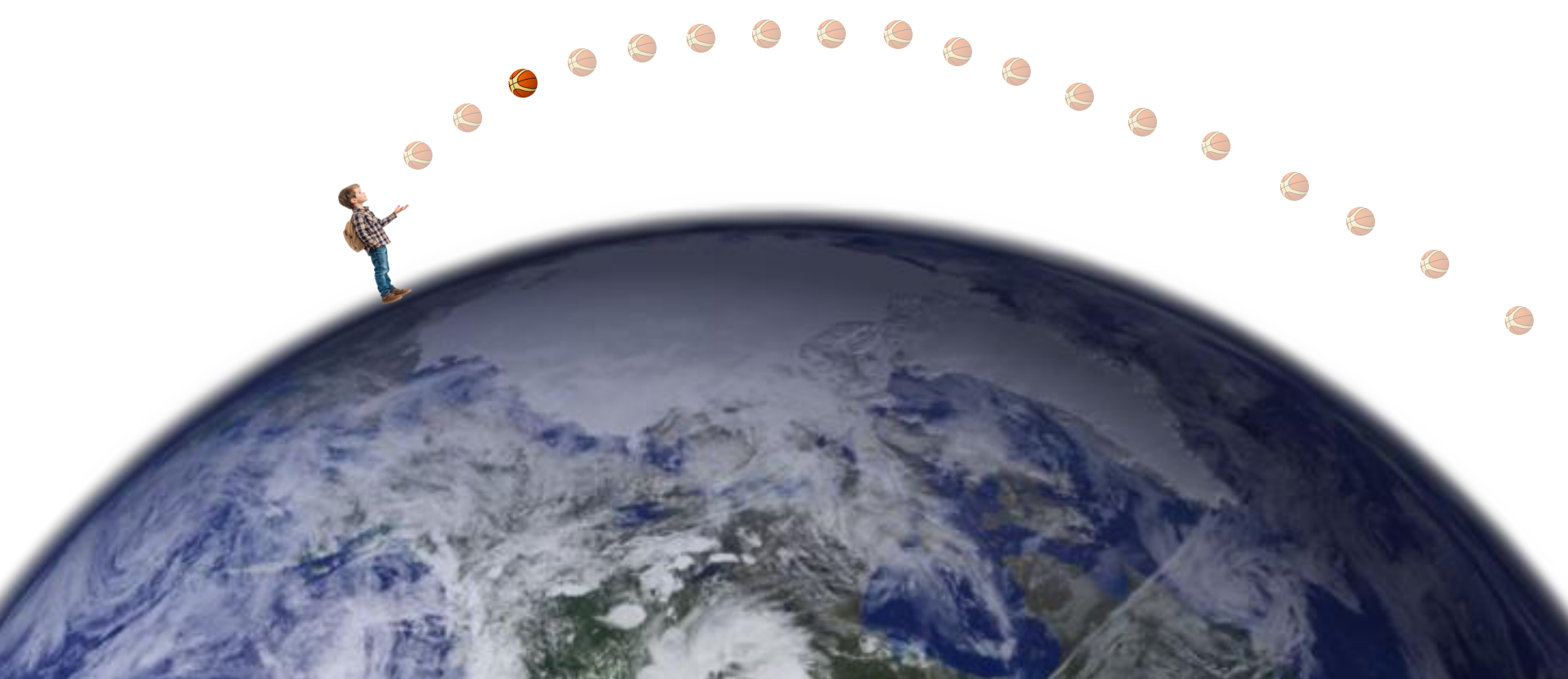
What is Orbit?



What is Orbit?

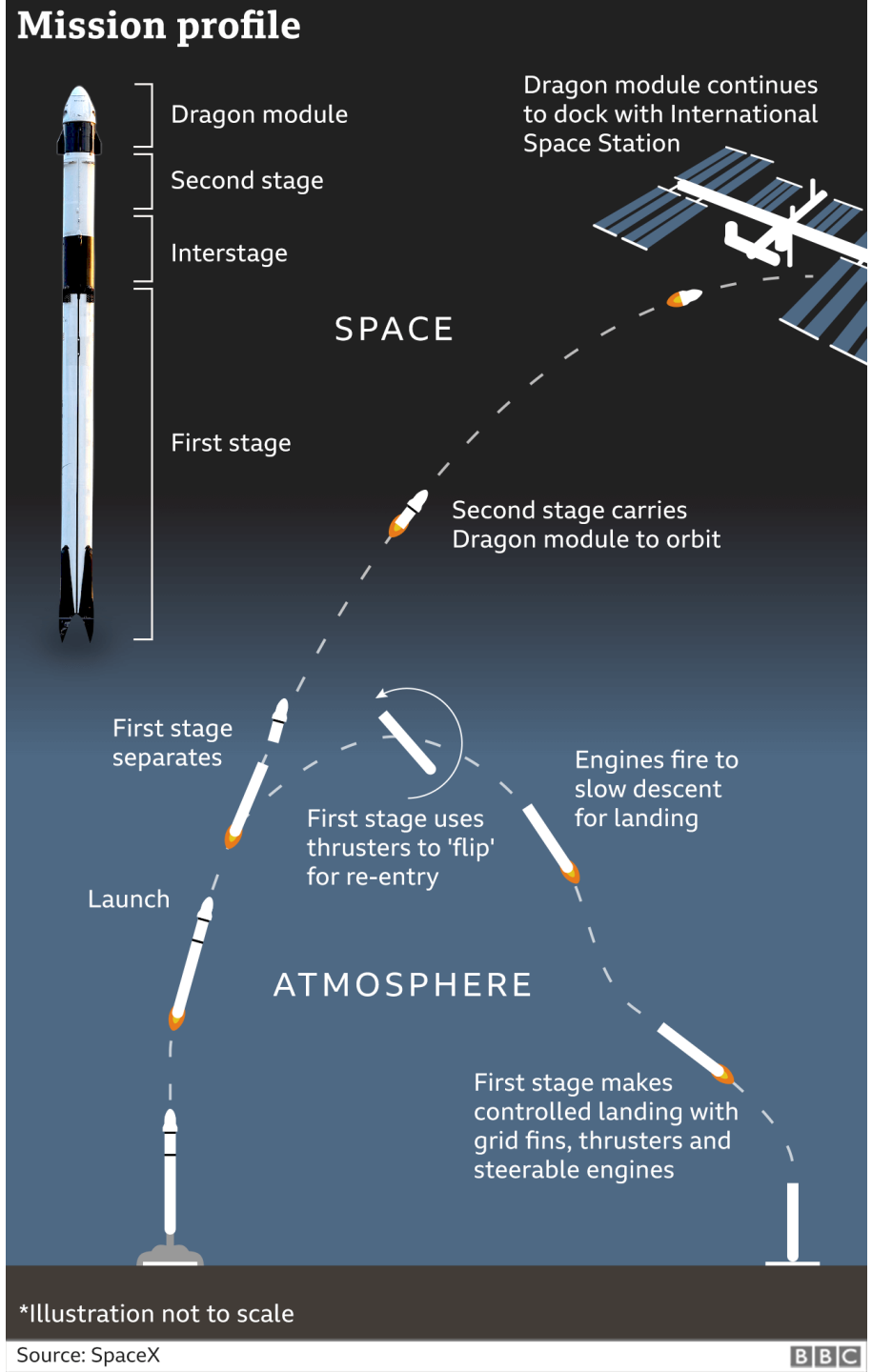


What is Orbit?



How do we orbit?

Quick Rocket Guide



How do we orbit?

What do we use orbit for?

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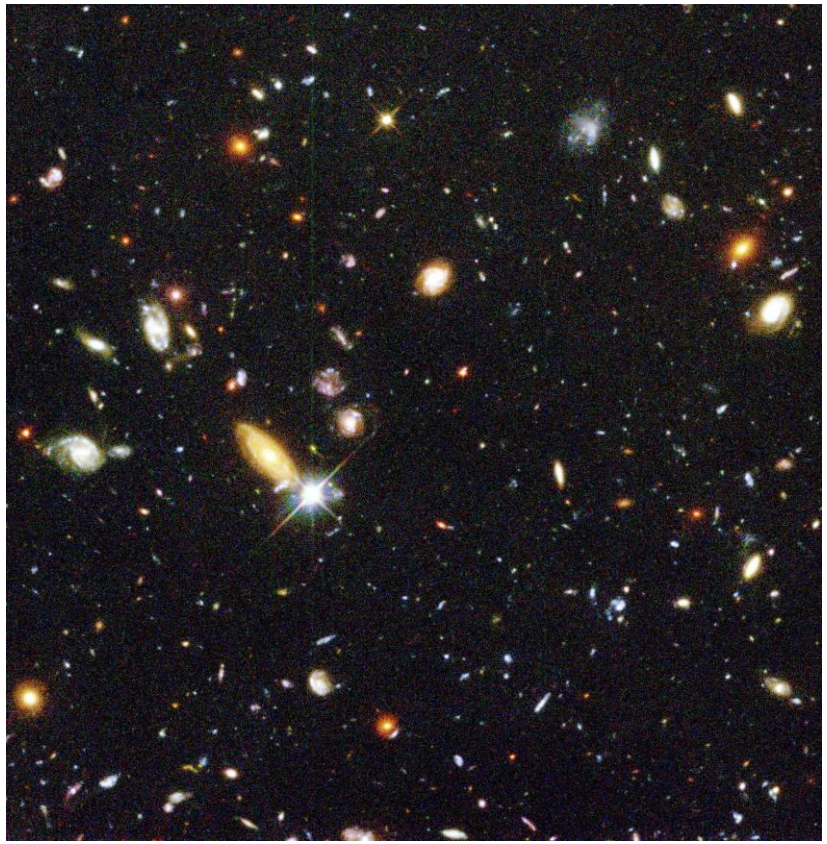


What do we use orbit for?

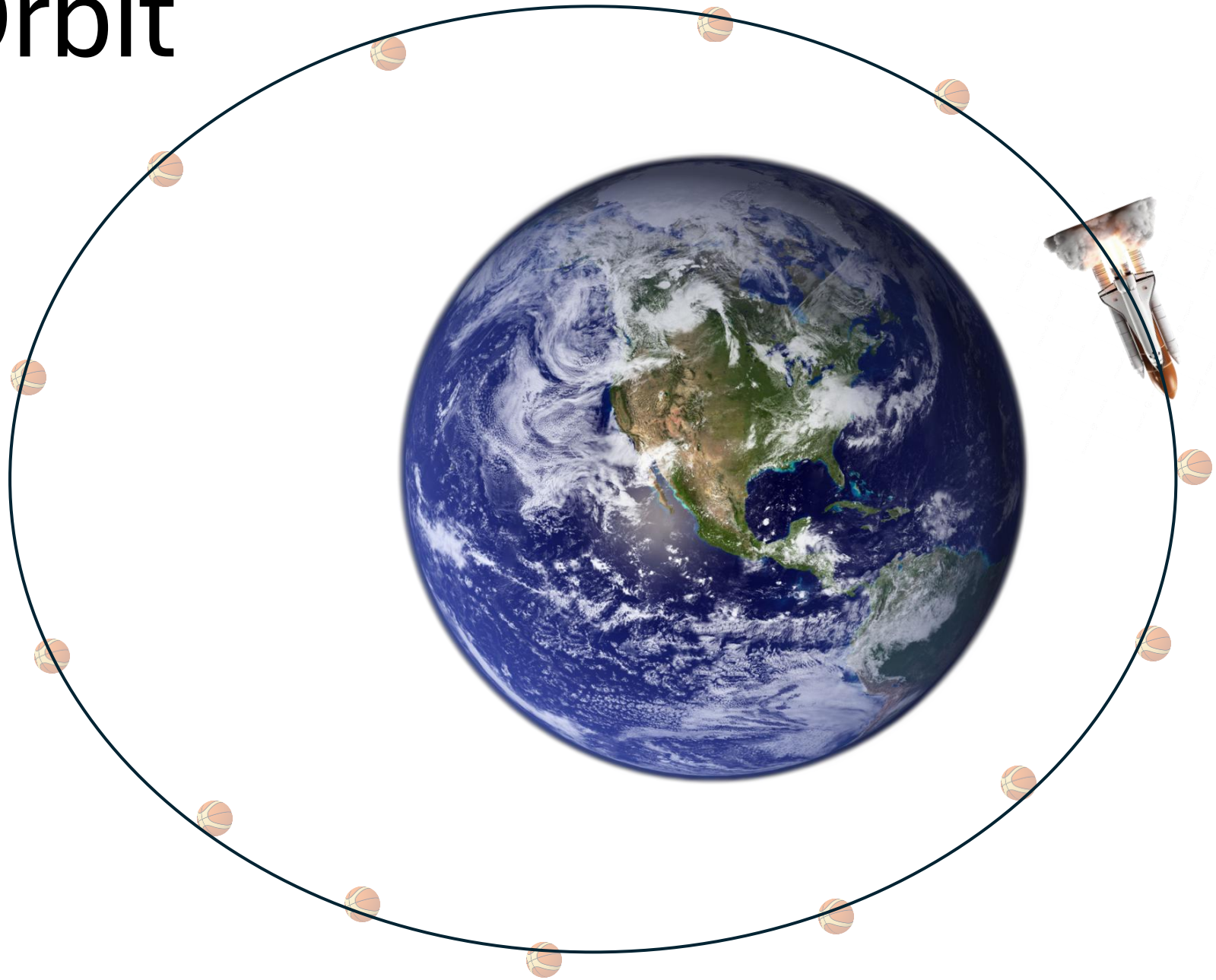
How do we get out of “orbit”?

Escape?

Escape?

Orbit

Orbit



Let’s simulate this

Artemis II – The Mission

What were the objectives?

1. Fly by the moon
2. Take pictures
3. Proof of Concept

Timeline

Step 1: Teach Geology to Astronauts

Trip to Iceland

Timeline

Step 2: Learn how to fly the spacecraft

Timeline

Step 3: Suit Up and Walkout

Timeline

Step 4: Board the Spacecraft

Timeline

Step 5: Launch

Timeline

Step 6: Launch

Timeline

Step 6: Orbit

ARTEMIS II

First crewed flight to the Moon since Apollo

MISSION DURATION
approx. **10 days**

DISTANCE TRAVELLED
over **1 million km**

Engine burn(s)

OUTBOUND TRANSIT (approx. 4 days)

1. **Launch**
   from Kennedy Space Center on the Space Launch System
2. **Raise manoeuvres**
   set Orion on high Earth orbit
3. **Proximity operations**
   Crew take over controls to demonstrate manual handling of Orion
4. **Life systems checkout**
   in high Earth orbit
5. **Translunar injection**
   sets Orion on course to the Moon
6. **Lunar fly-by**
   about 10,400 km beyond the far side of Moon

RETURN TRANSIT (approx. 4 days)

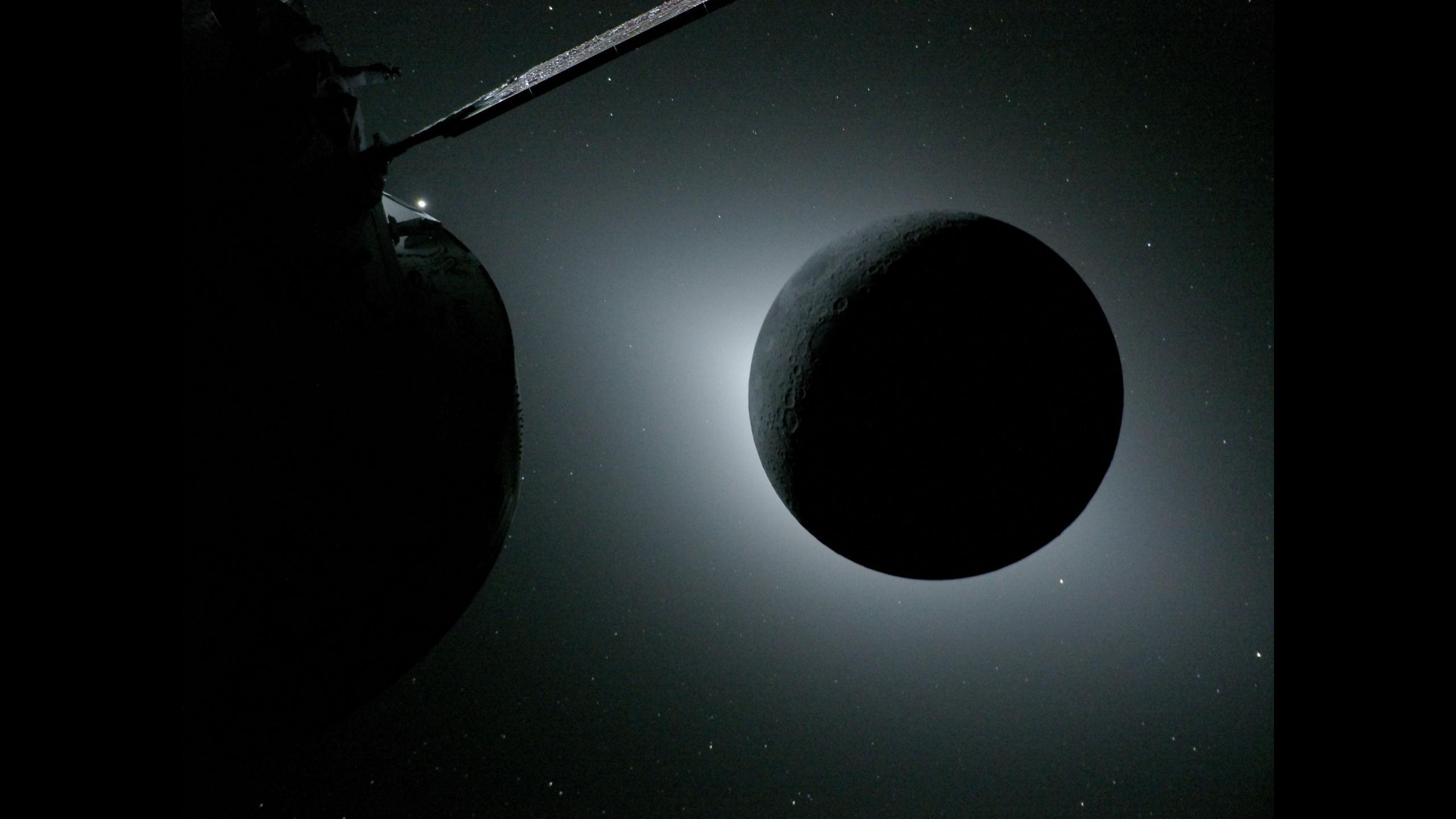
7. **Inbound flight**
8. **Reentry and splashdown in Pacific Ocean**

Canadian Space Agency | Agence spatiale canadienne

Canada

Let’s simulate this

esa
NASA




NASA
NASA'S ARTEMIS II
CREW LAUNCHES TO THE MOON

Bibliography

- Terence Tao's "The Cosmic Distance Ladder" Presentation: https://terrytao.wordpress.com/wp-content/uploads/2010/10/cosmic-distance-ladder.pdf
- Sagan, C. (1985). Cosmos. Ballantine Books.
- Grant Sanderson (3Blue1Brown)'s Cosmic Distance Ladder video series

Acknowledgements

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Licensing Information

Link to Presentation: https://bit.ly/newtonianocosmic