

A
pale
bleu
dot

9 Squares to Discover the Globe

When he sees the photo of our planet taken from space, astrophysicist Carl Sagan writes :

“Look again at that dot. That’s here. That’s home. That’s us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The Earth is a very small stage in a vast cosmic arena.»

This exhibition was designed by Iona Sagnelonge during an internship with the Physics Reimagined team.

Design, illustrations, objects, signage, paper, video : Iona Sagnelonge
Scientific content : Julien Bobroff

Many thanks to Lou-Andreas Etienne, Camille Debard, Lisa Dehove, and Philippe Thébault.
The museum itself was designed by Alexandre Échasseriau.

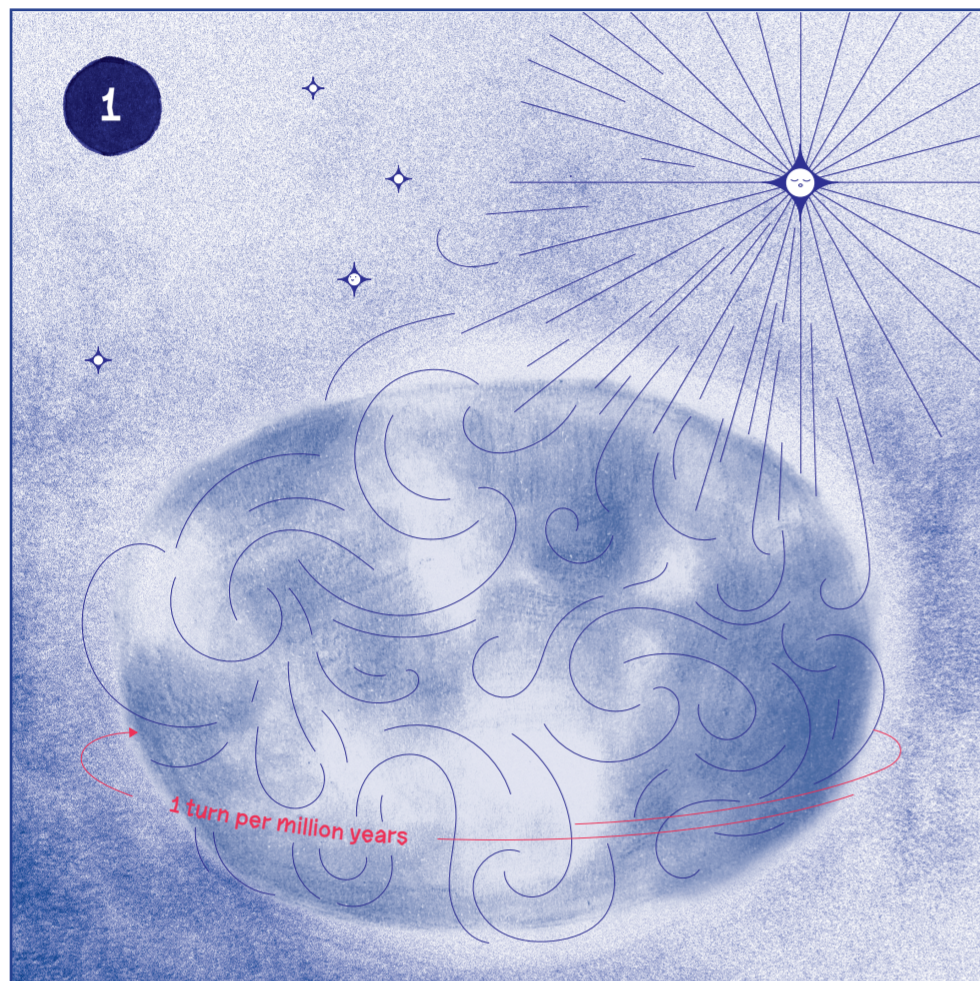
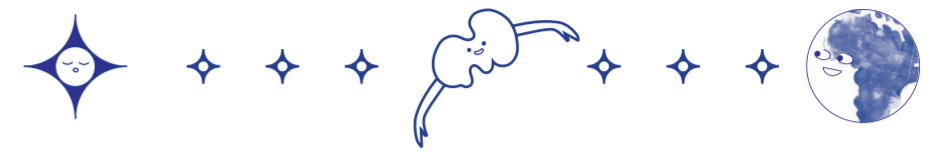
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It was created on the premises and with the technical resources of the CEP of the Villebon - Georges Charpak Institute.


LA PHYSIQUE
AUTREMENT

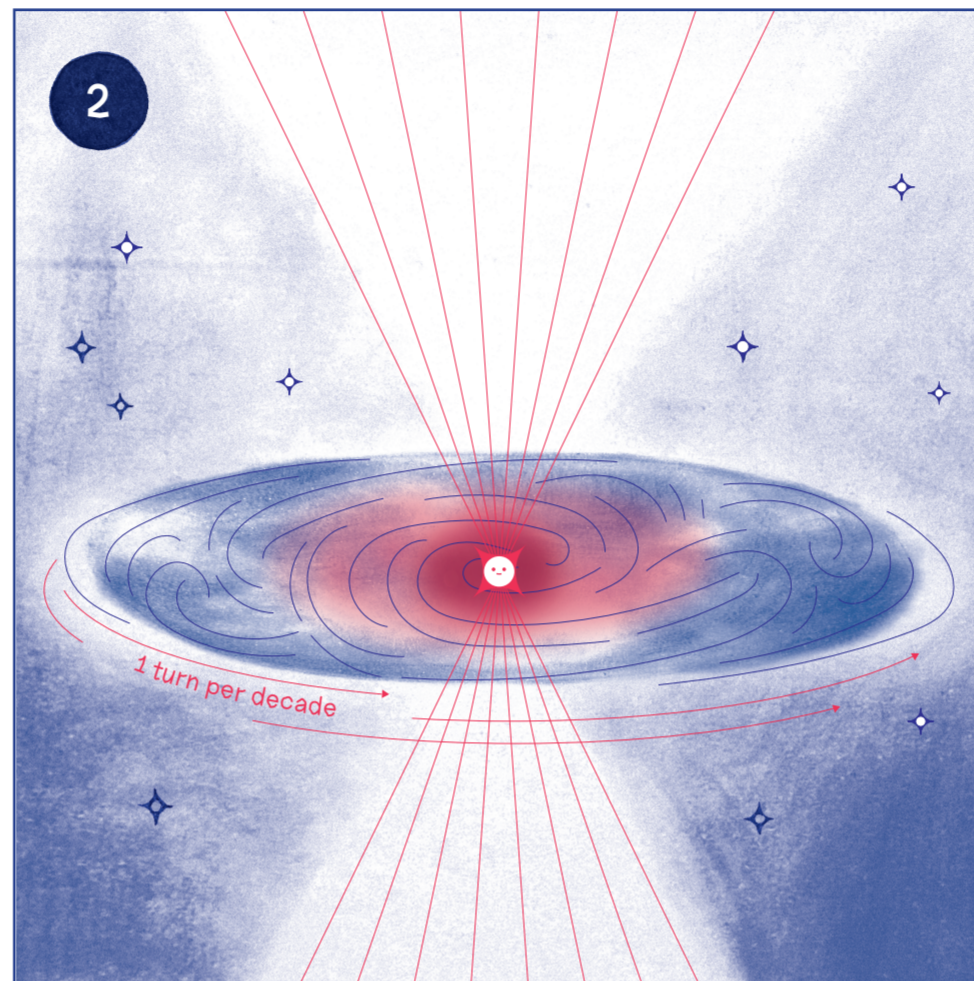
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DES SCIENCES
D'ORSAY



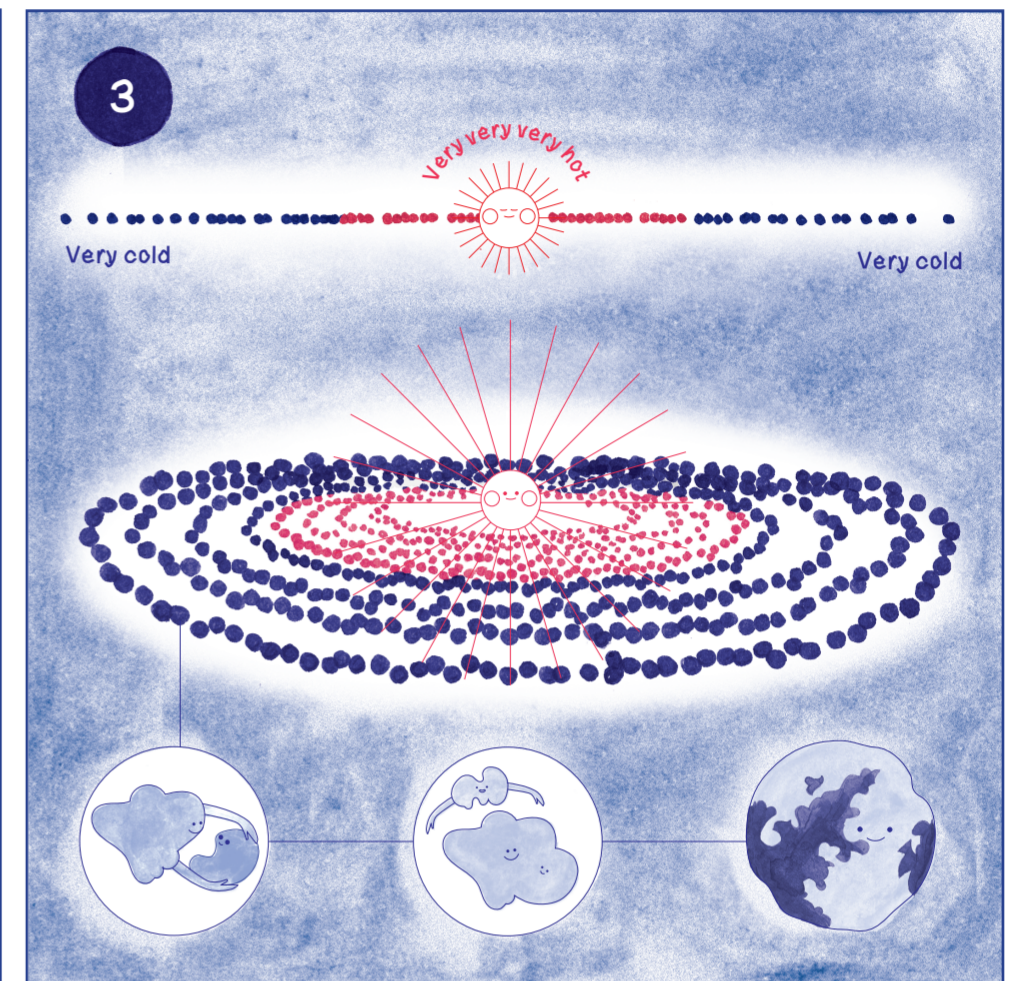
Where does the Earth come from?



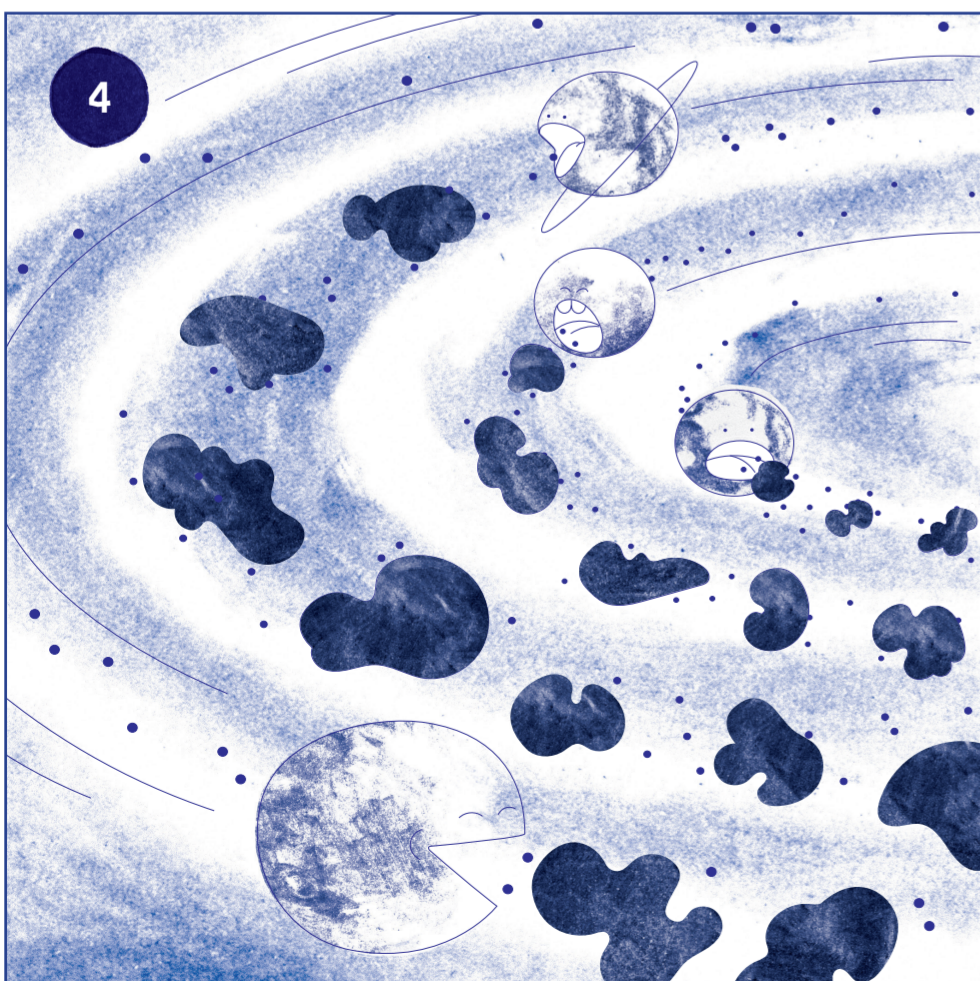
More than 4 billion years ago, a star explodes, leaving behind a huge cloud of gas that slowly rotates on itself...



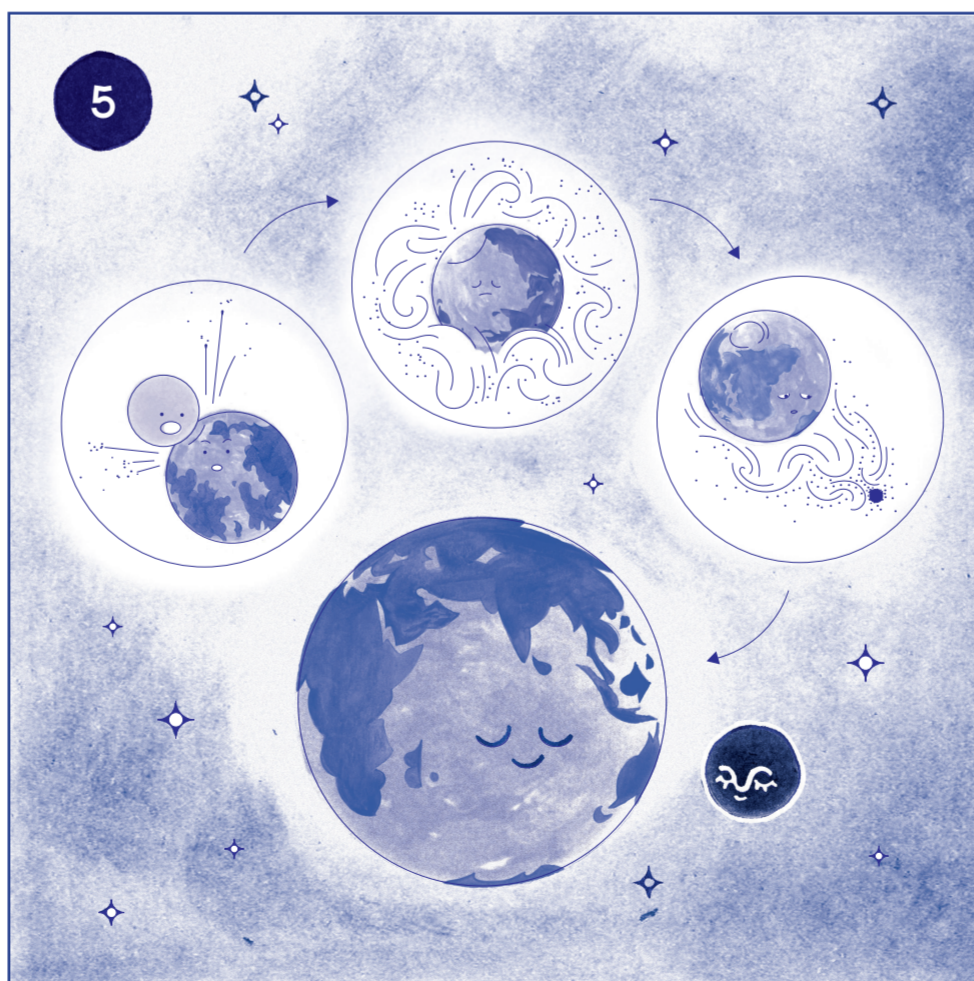
Under the influence of gravity, this cloud collapses on itself and forms a very hot disk, which rotates much faster.



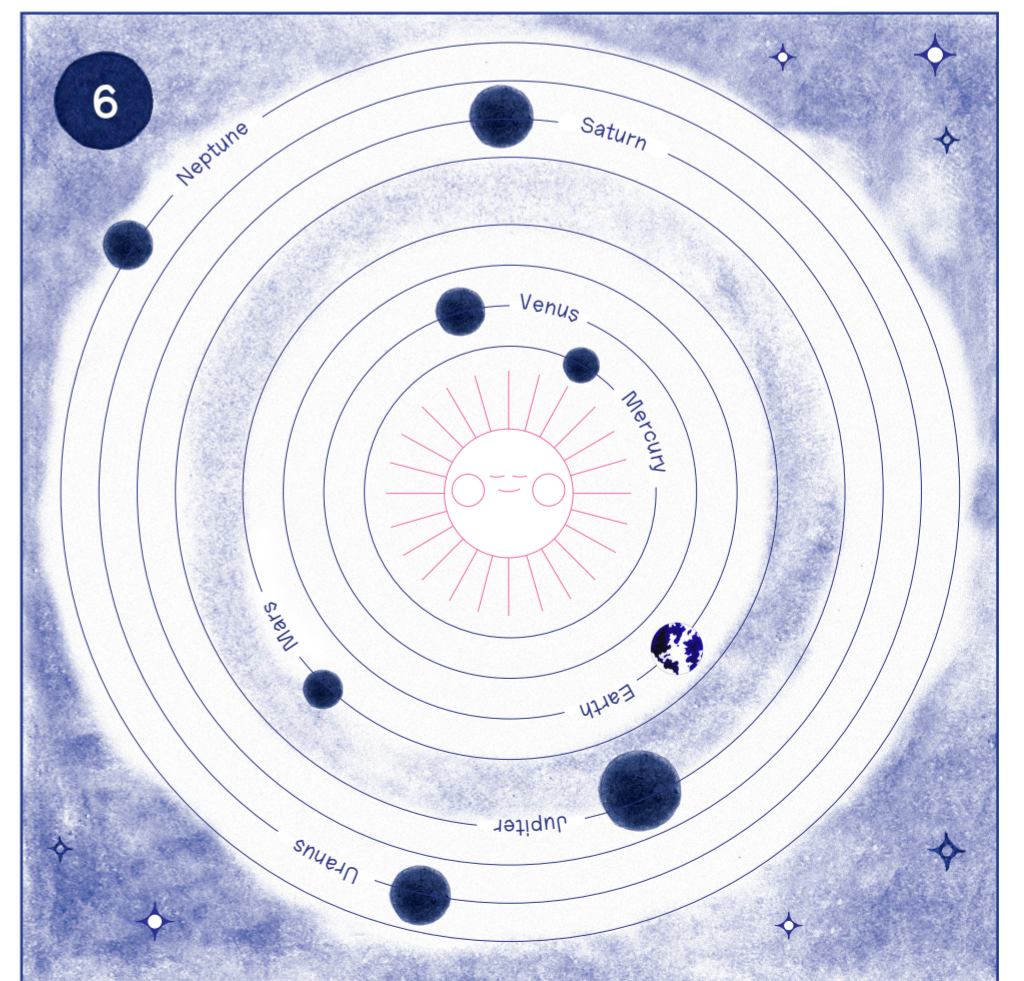
On the cooler edges, the molecules slow down and aggregate into small grains, which eventually form asteroids that are a few kilometers long.



Gravity attracts asteroids to one another, and little by little they form larger planets.



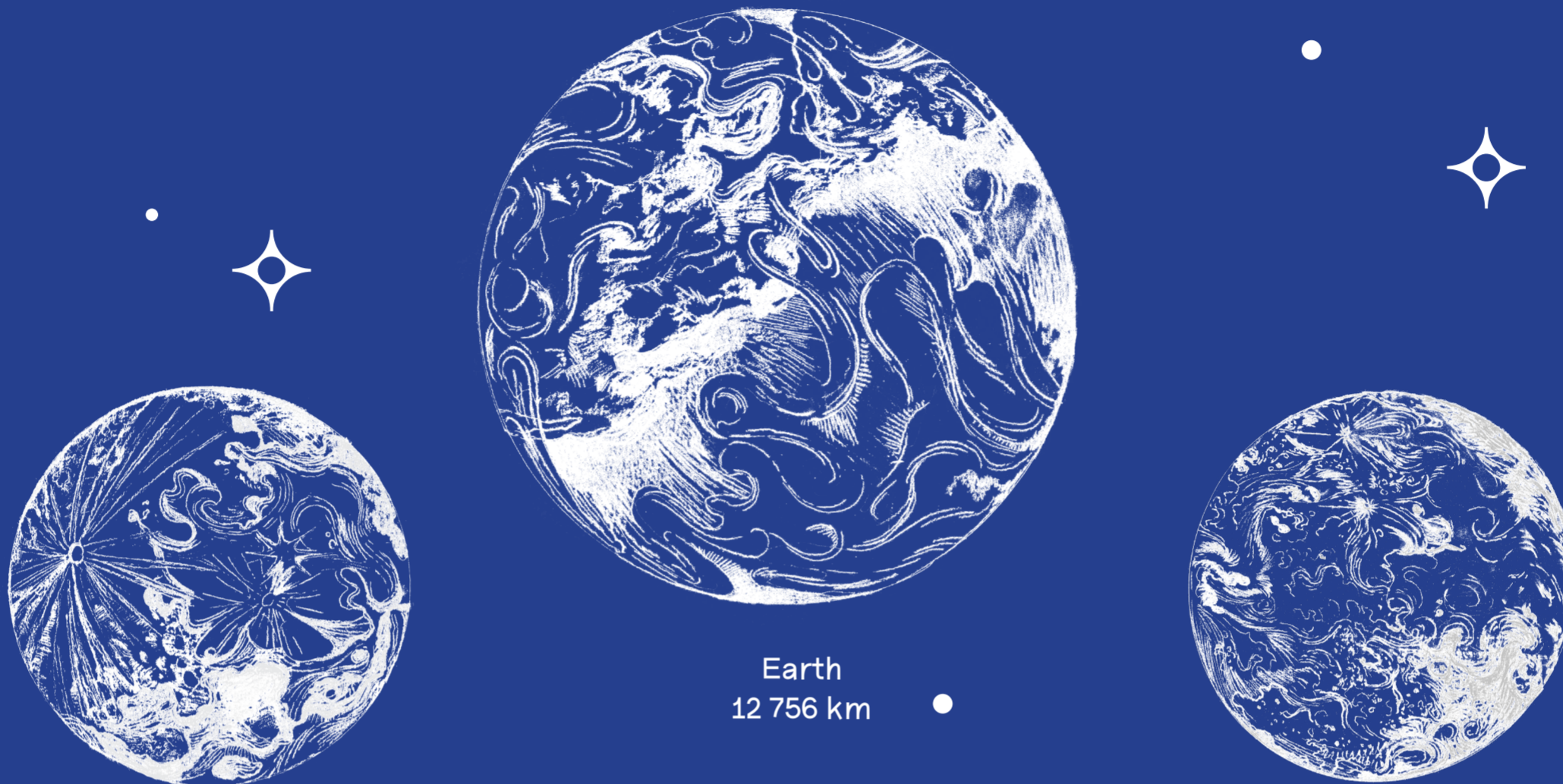
Our Earth collides with a smaller planet, Theia. This collision gives birth to the Moon.



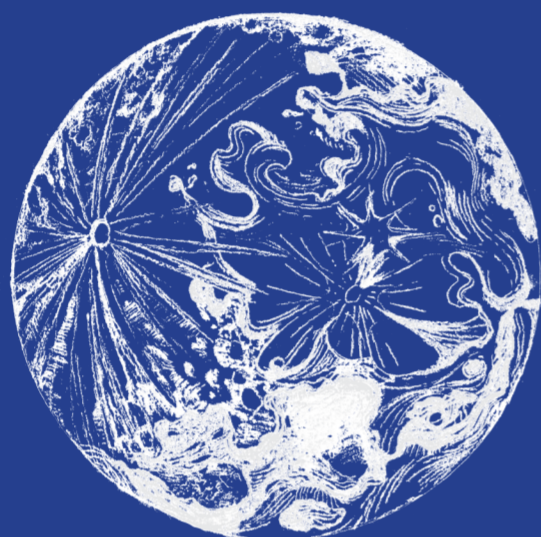
Nearly a hundred million years after the initial collapse, all the planets are now in stable orbits around the Sun. Welcome to our solar system !

Cosmic inventory

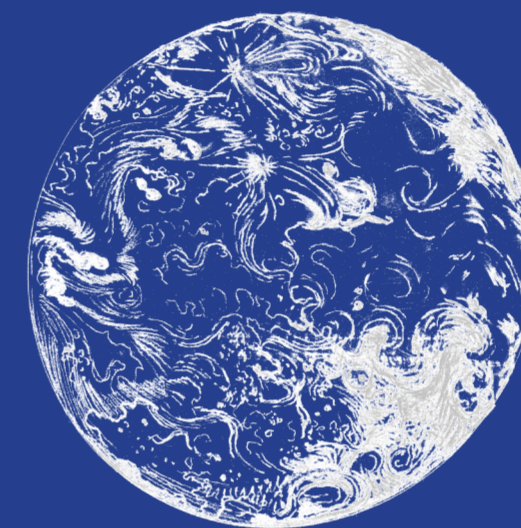
When a stellar object forms, gravity pulls all of its matter toward its center. When its diameter exceeds 100 km, it naturally takes the shape of a sphere.



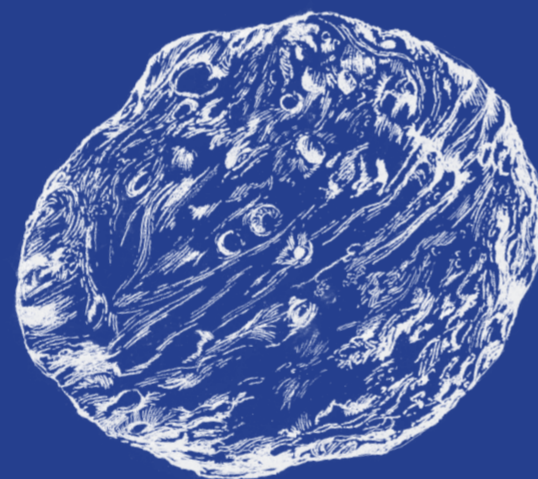
Earth
12 756 km



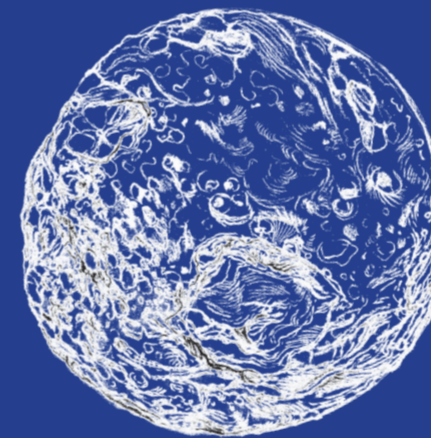
Moon
3 475 km



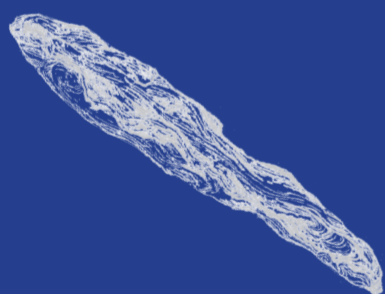
Pluto
2 377 km



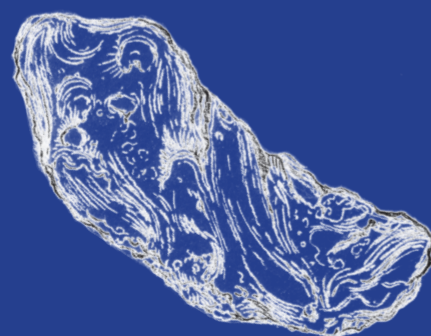
Vesta
525,4 km



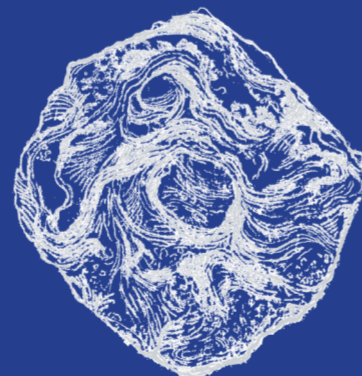
Mimas
396 km



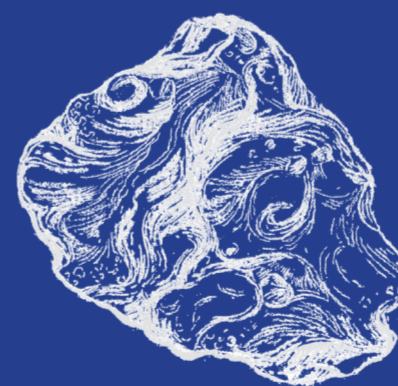
Oumuamua
200 m



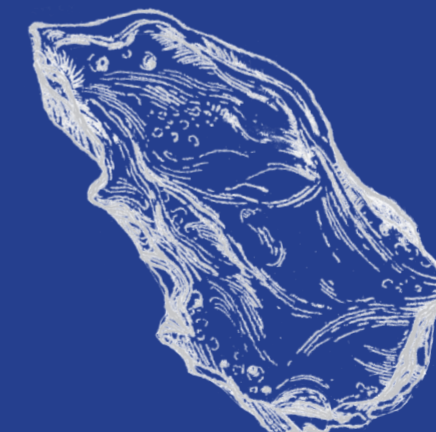
Itokawa
313 m



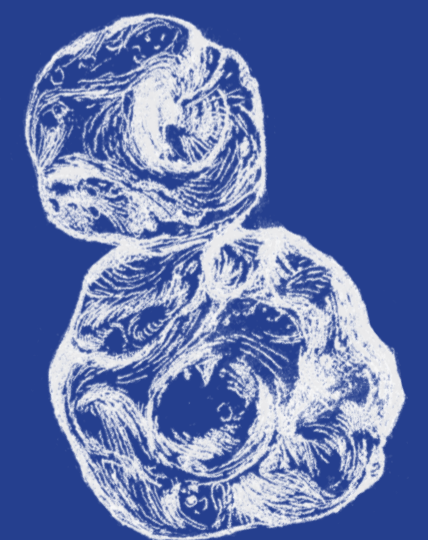
Bénou
525 m



Icare
1 km



Gaspra
12,2 km



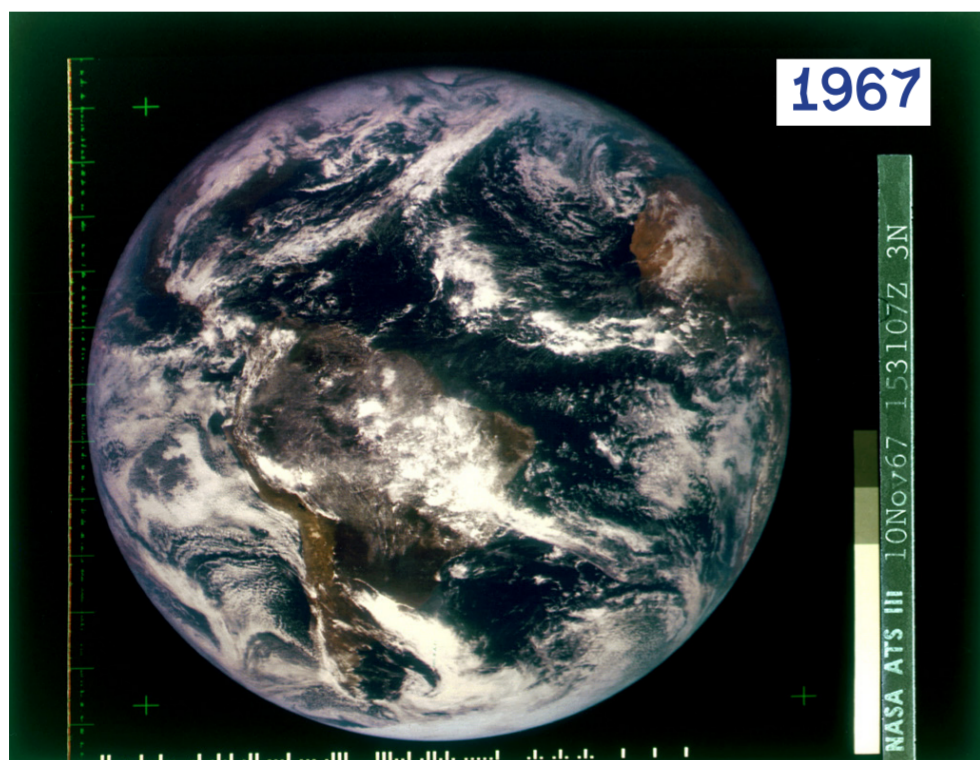
Arrokoth
30 km

This explains the bizarre shapes of celestial objects that are less than 100 km in diameter, such as asteroids.

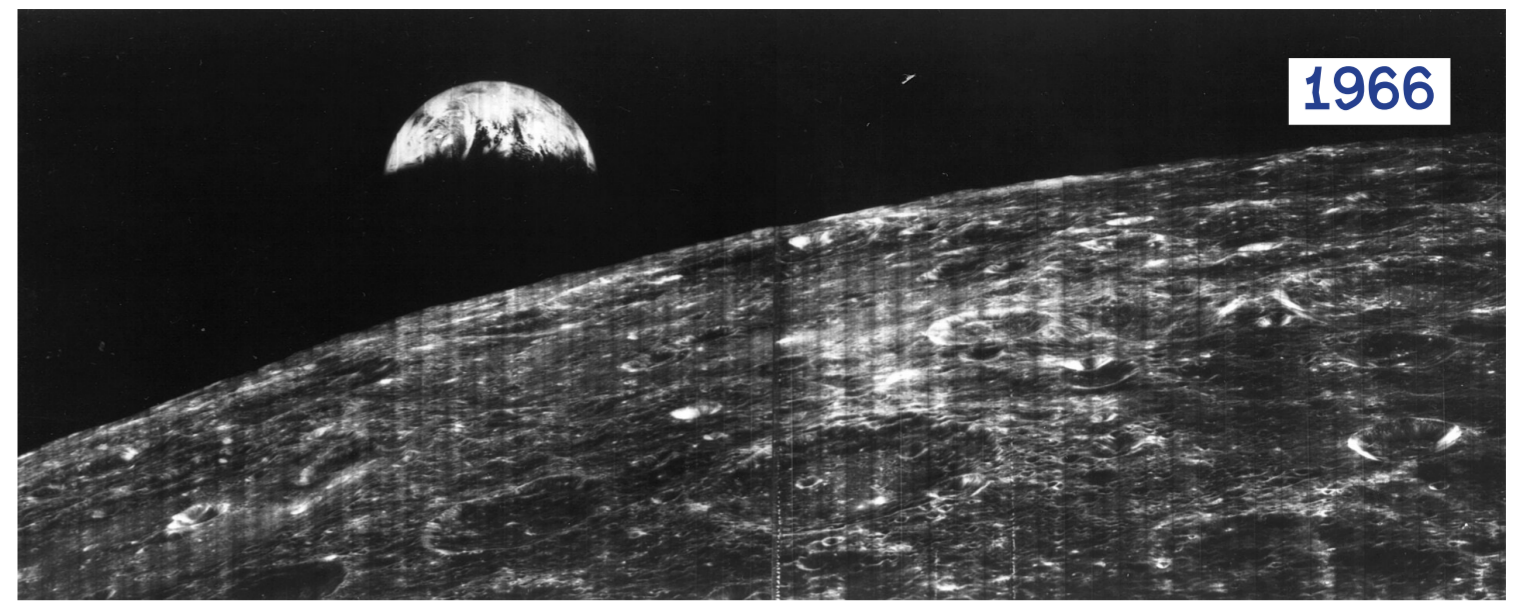
From the outside



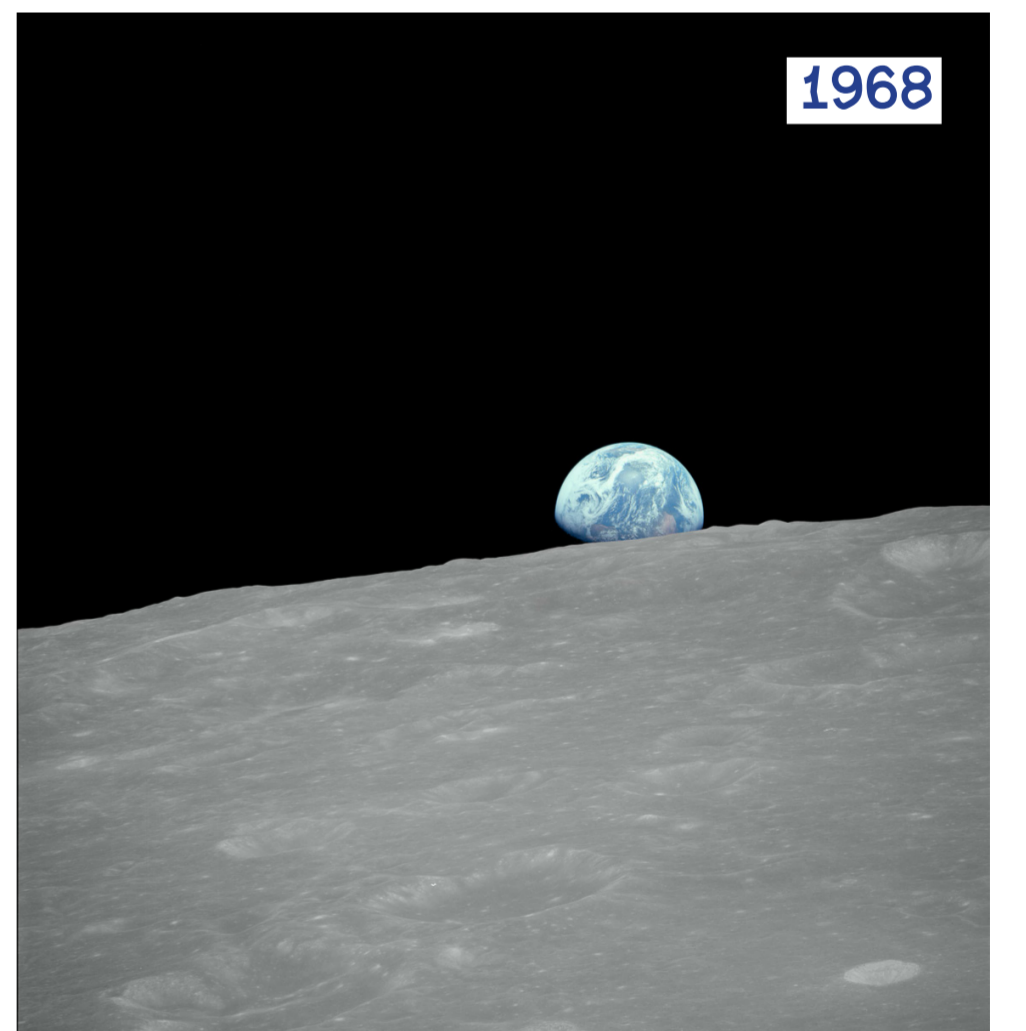
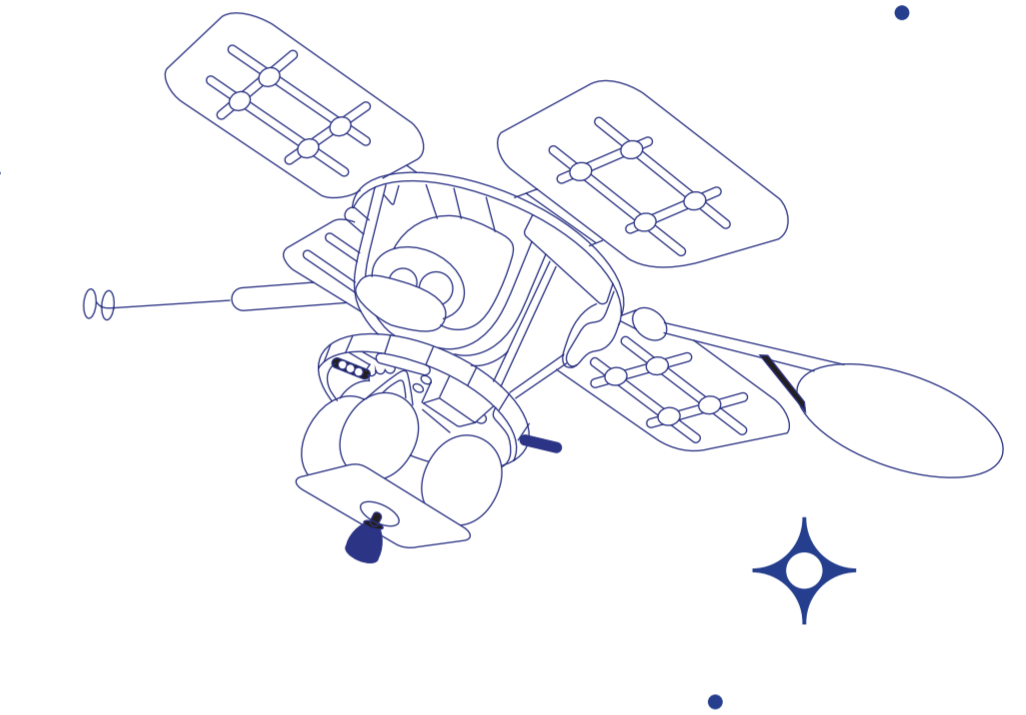
First image of the Earth
 † Photo captured by a V2 rocket.



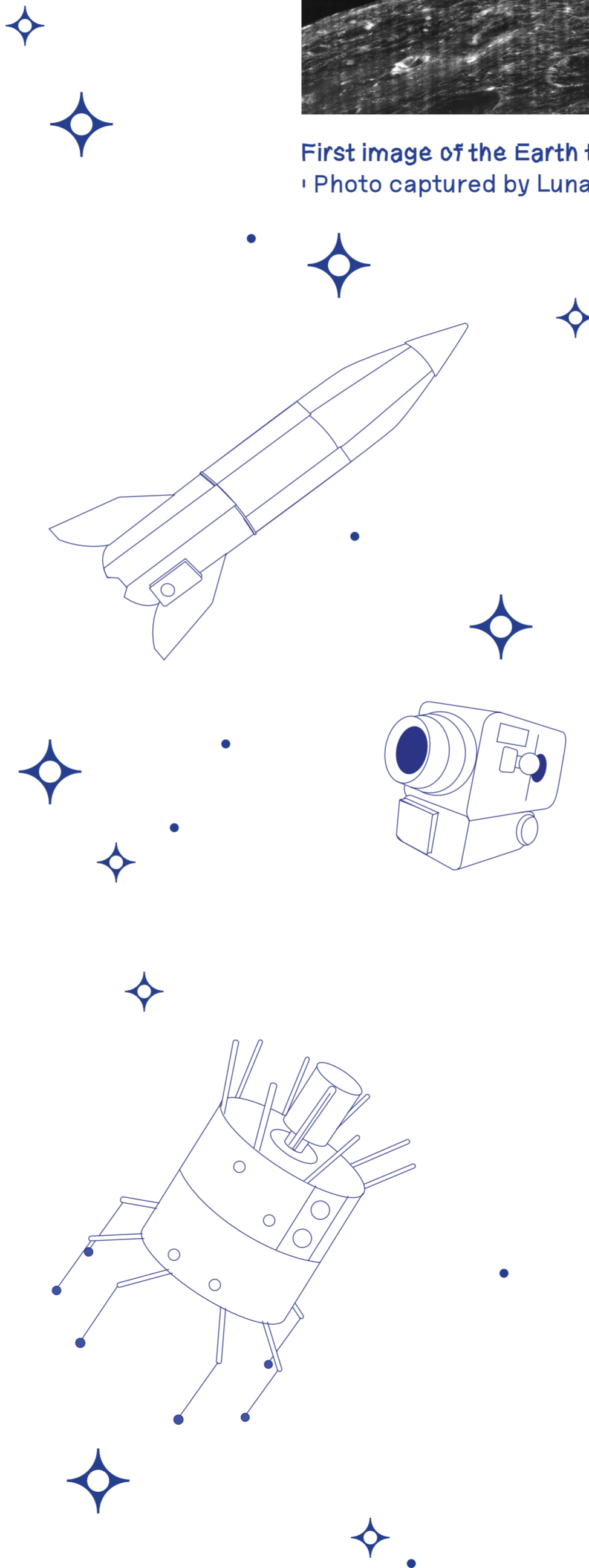
First color image of the Earth
 Photo captured by an ATS-3 satellite and later used as the cover of the first «Whole Earth Catalog».



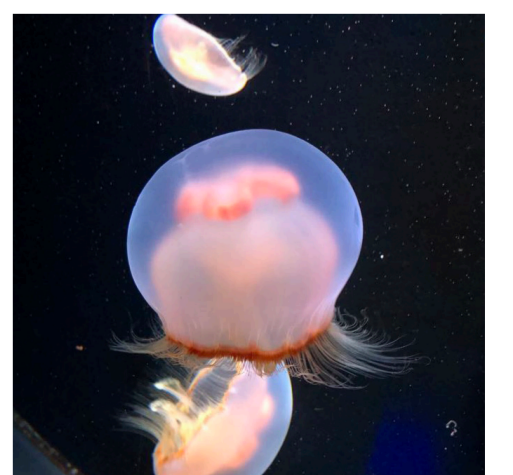
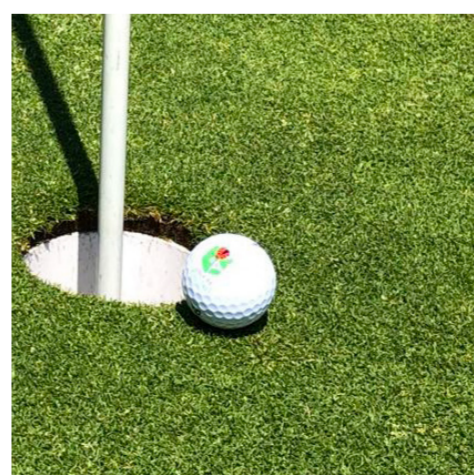
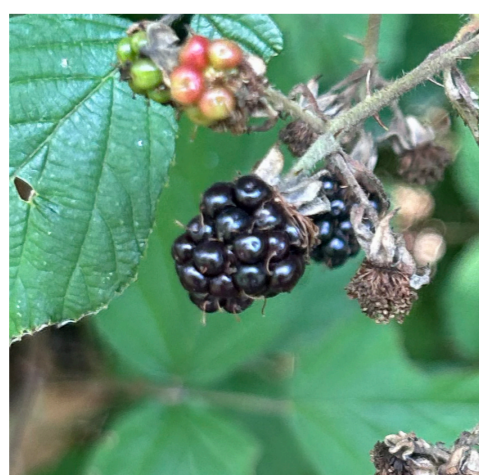
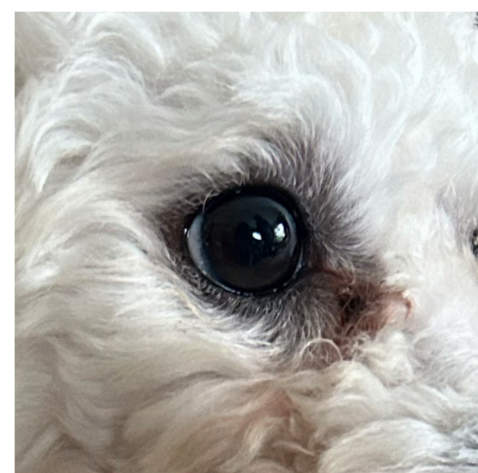
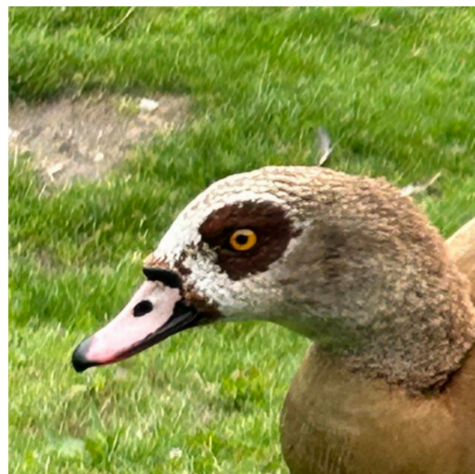
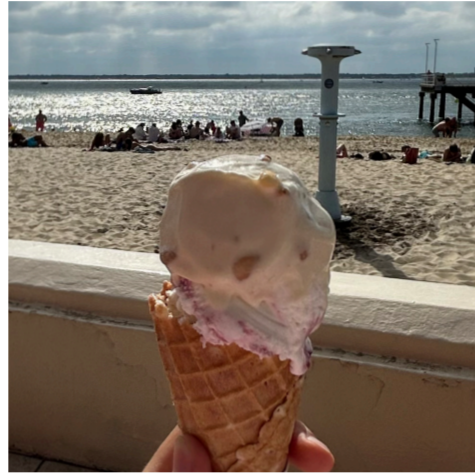
First image of the Earth taken from another astronomical object
 † Photo captured by Lunar Orbiter 1 from the Moon.



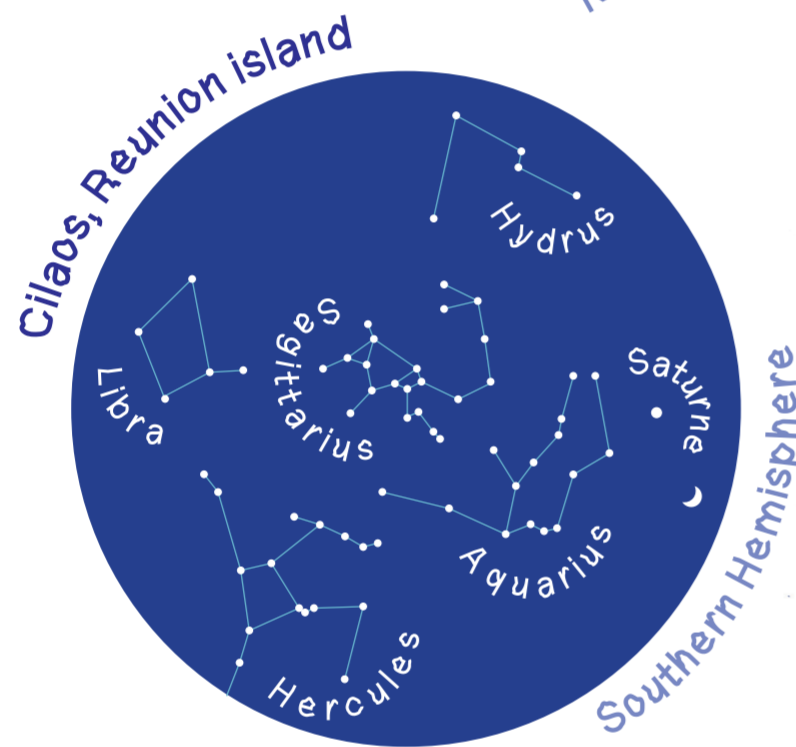
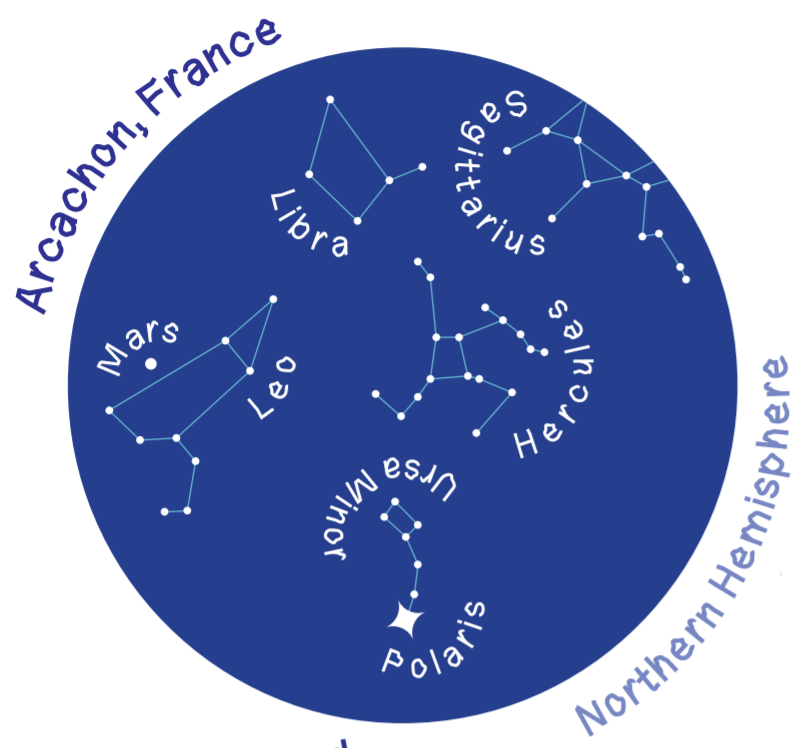
First image of the Earth taken by a human from another astronomical object
 † Photo captured on the Moon by William Anders during the Apollo 8 mission with a Hasselblad 500.



Circles everywhere



It's round : here's the proof

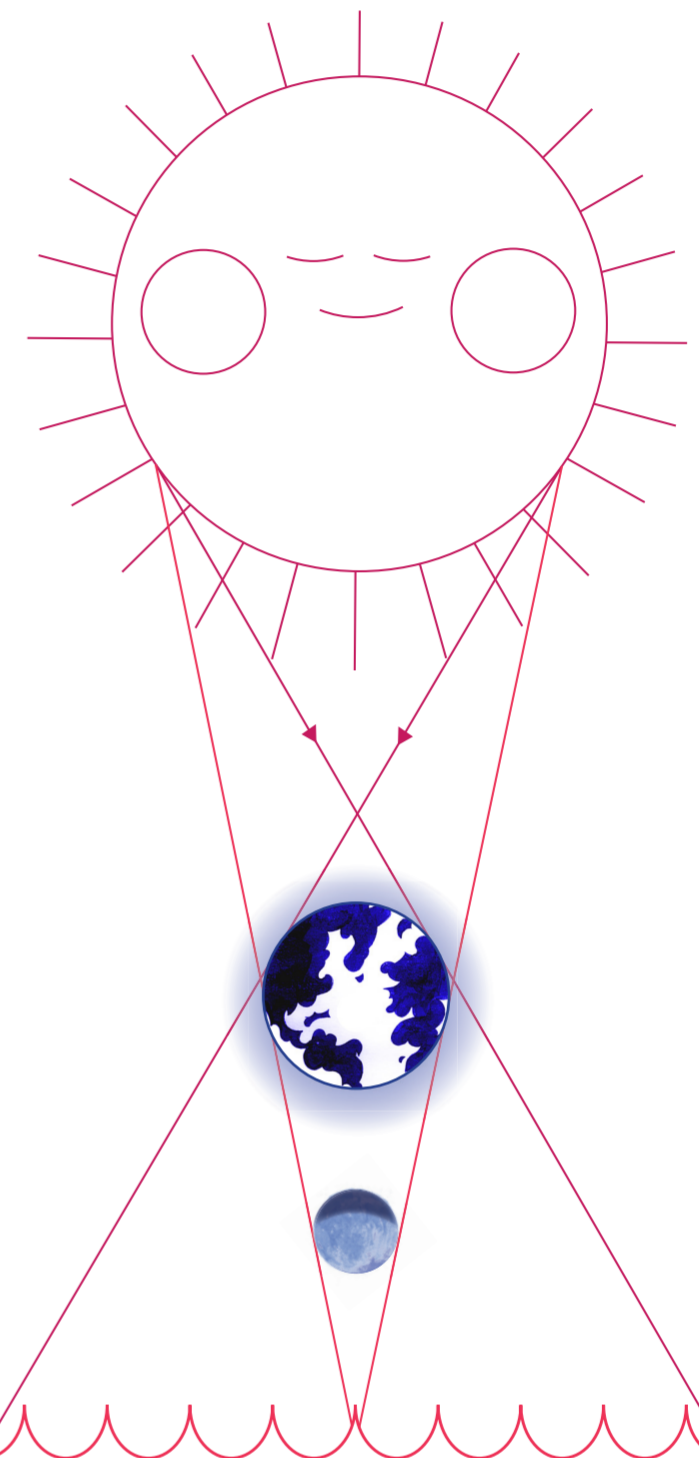
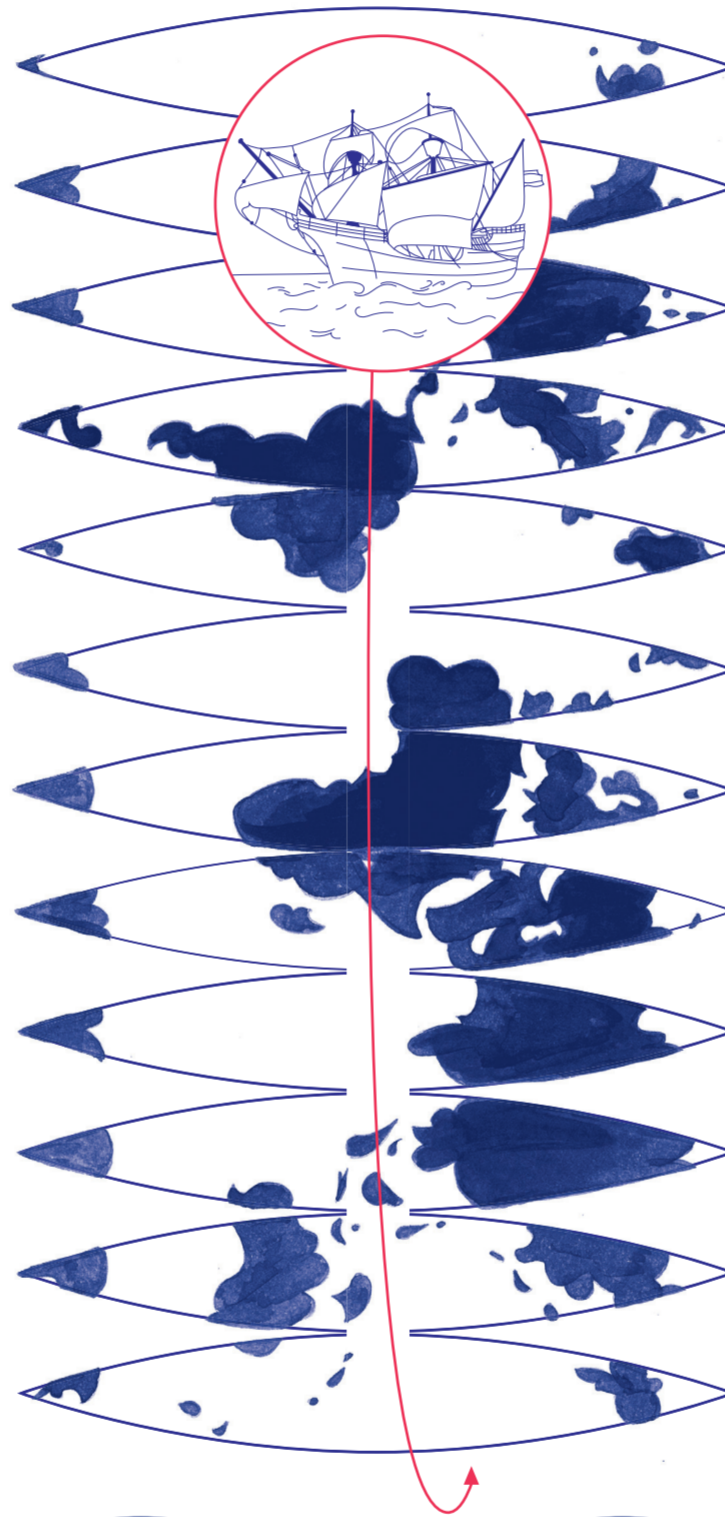


Stars

Only a round Earth helps to understand why stars have different positions in the sky, depending on the latitude.

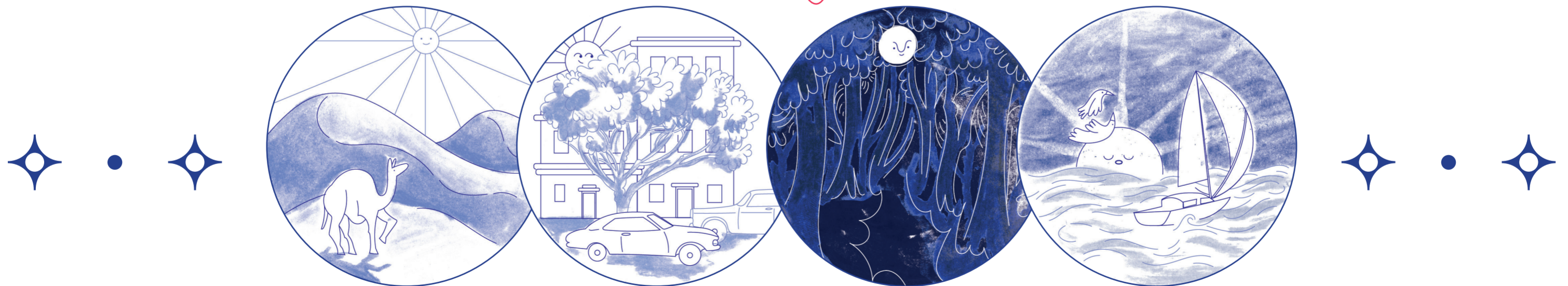
Sailors

In 1519, Magellan and his sailors begin an expedition that will become the first real circumnavigation of the globe, three years later.



Eclipses

During a lunar eclipse, the Earth's shadow on the Moon is always round.



Time zones

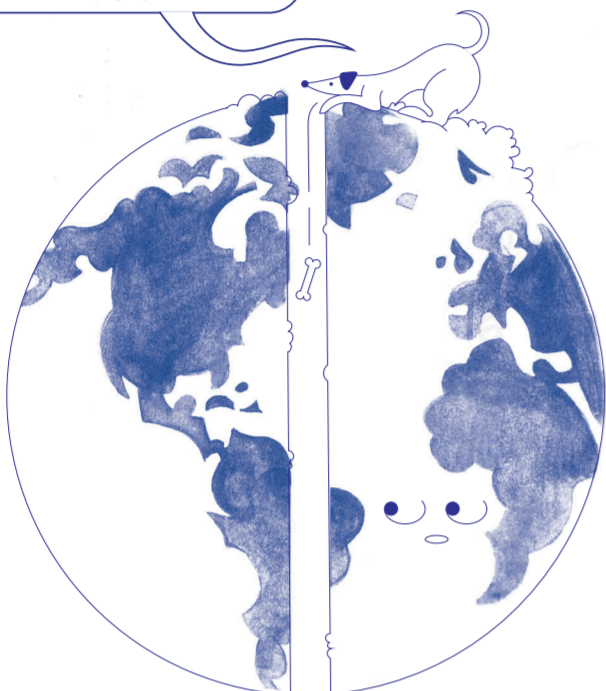
If the Sun only illuminates one half of the Earth at a time, leaving the other half in the dark, it's because it is round and rotating.

You will be surprised!

Oh yes, fun facts!



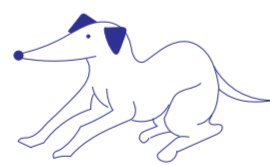
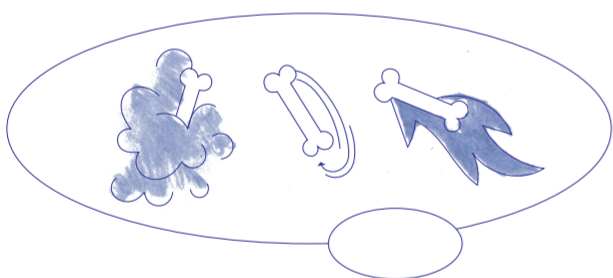
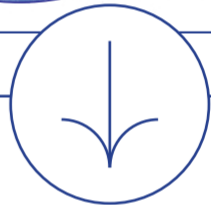
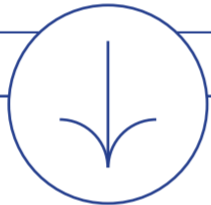
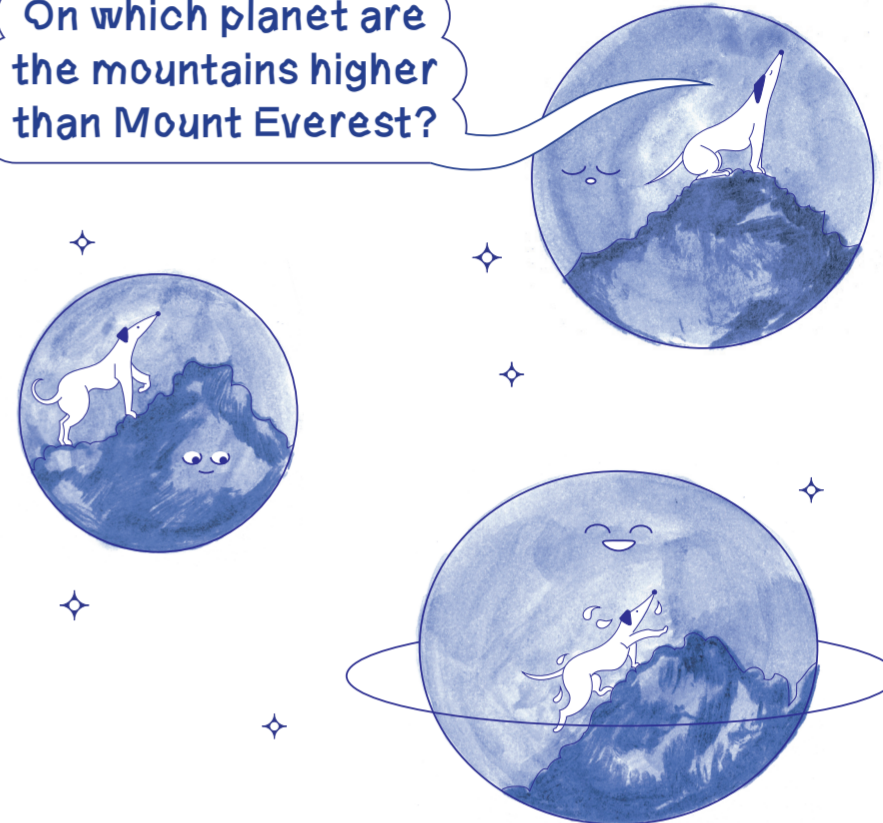
If I jump into a hole that goes through the Earth, what happens?



If I want to send a radio message to the other end of the world but I don't have an antenna, what can I do?



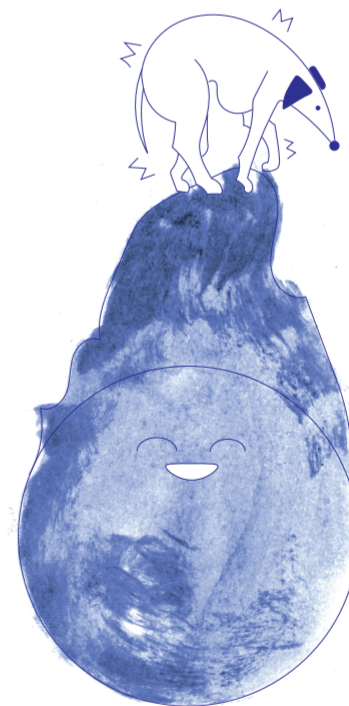
On which planet are the mountains higher than Mount Everest?



The journey would take 42 minutes, and once on the other side, we'd go back the other way, like a yo-yo! But given the temperature at the Earth's core, we'd burn up long before that...



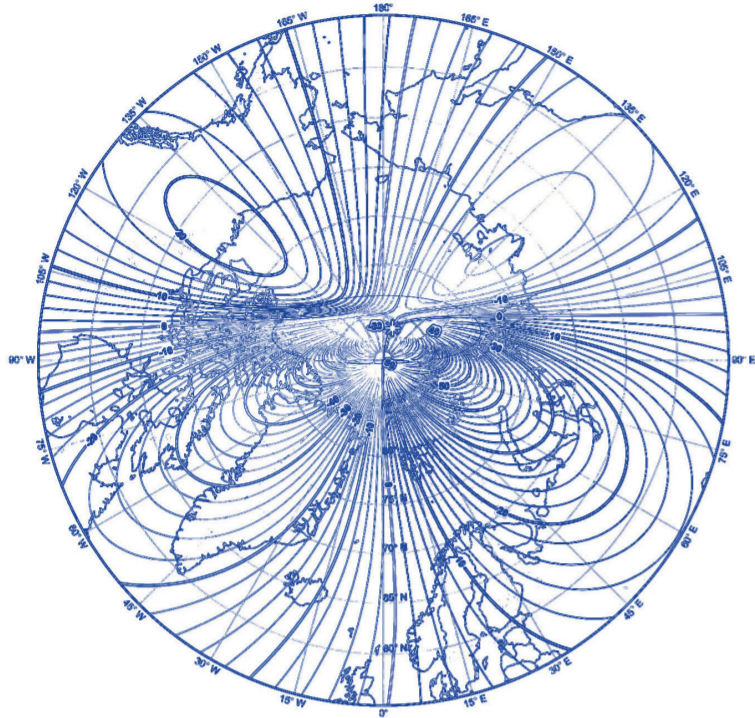
The upper layer of the atmosphere can be used to bounce radio waves. The wave is emitted, it bounces back and forth several times before being picked up on the other side of the globe. Careful, this only works with low-frequency radio waves!



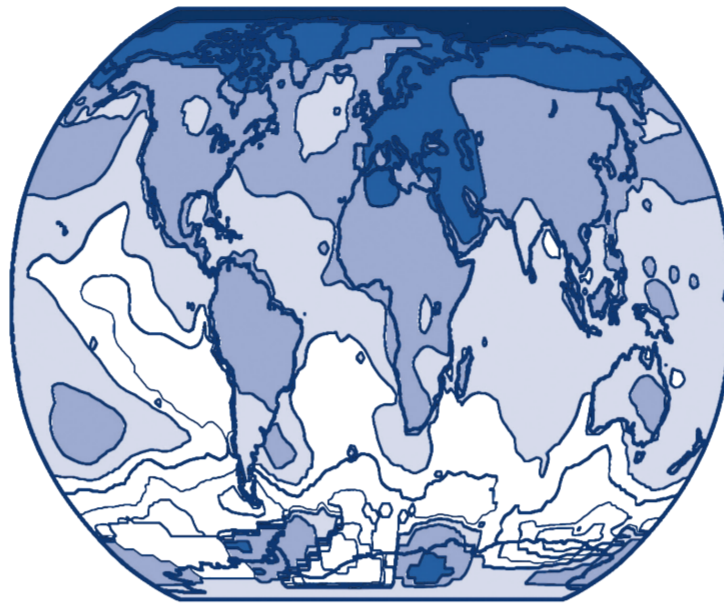
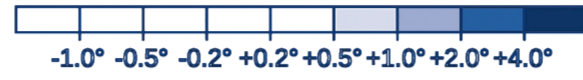
The smaller a planet, the less gravitational pull the mountain has, so the higher it is. On Mars, which is half the size of the Earth, Mount Olympus is 3 times the size of Mount Everest.

Observe the earth

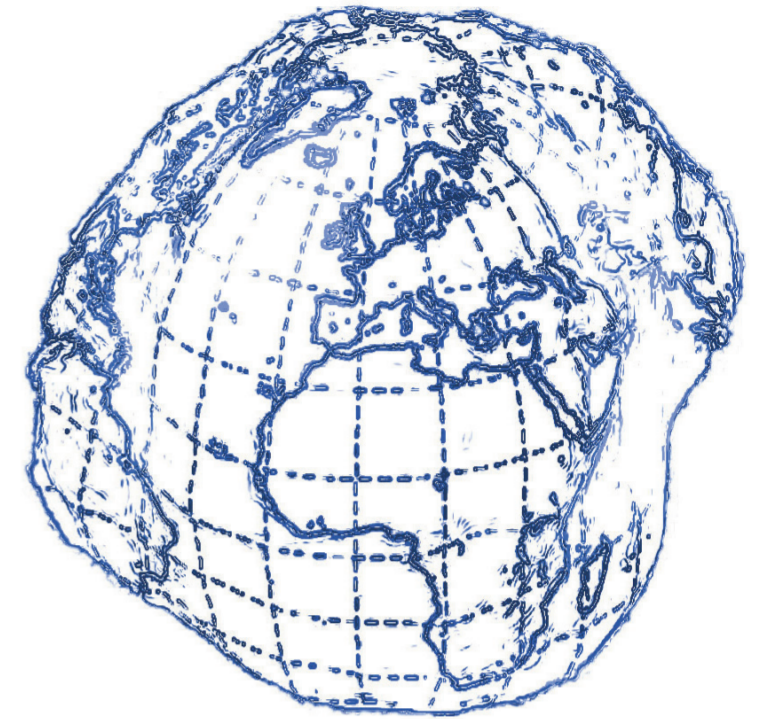
Scientists have many ways to represent the Earth, depending on what they are researching.



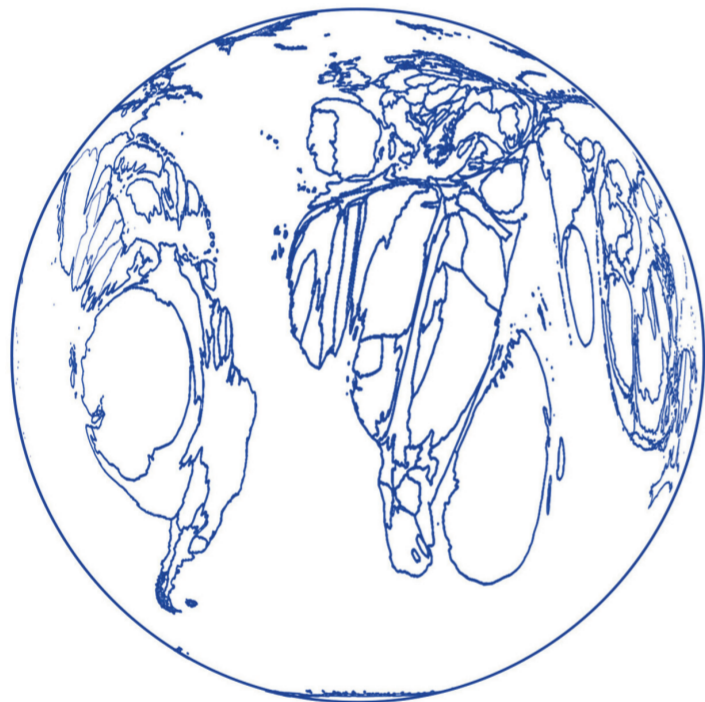
Earth's magnetic field



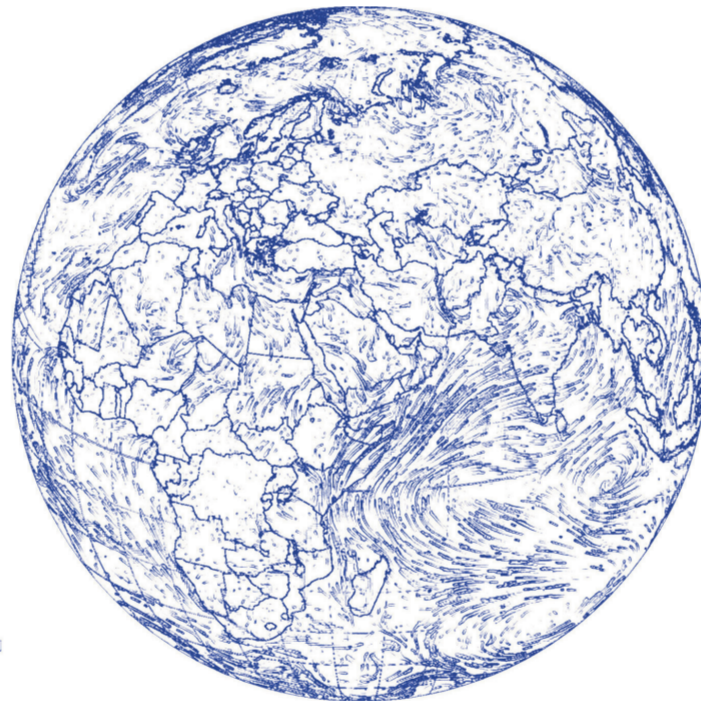
Rising temperatures since 1979



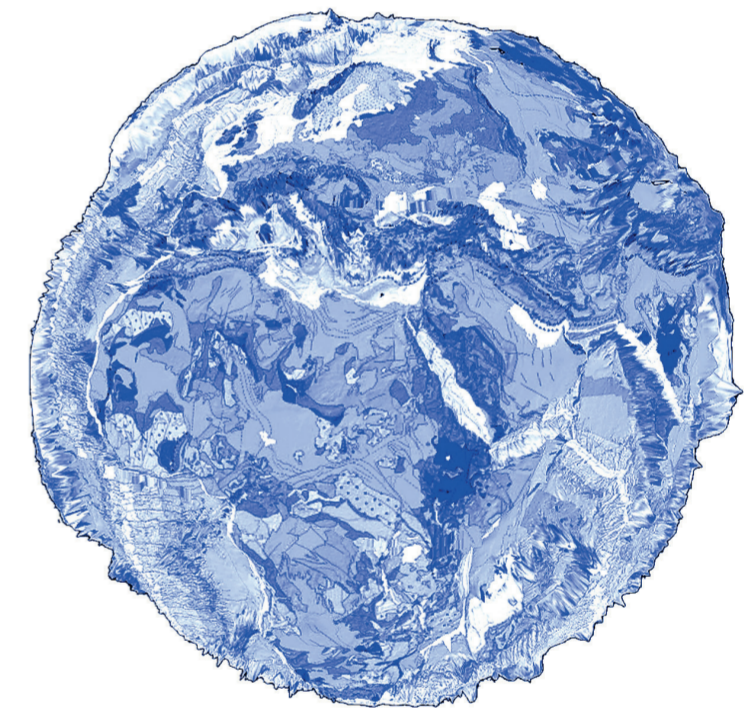
Gravity anomalies



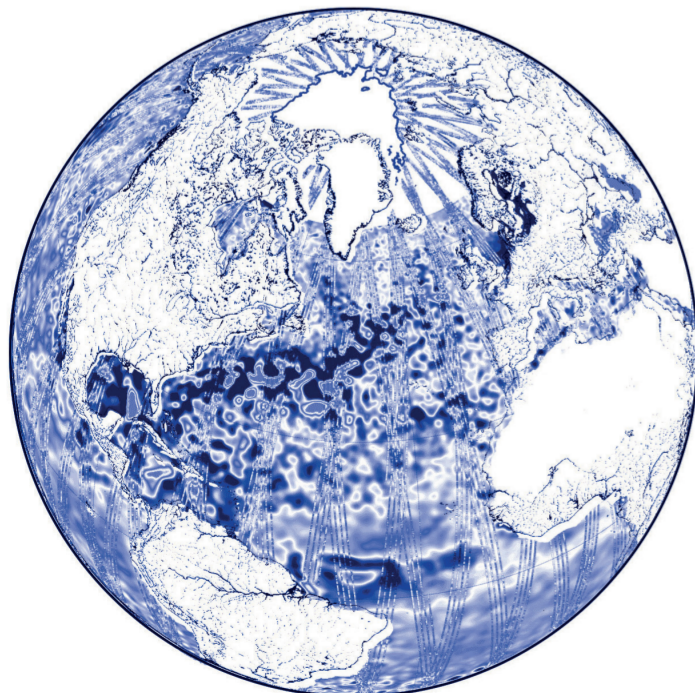
Proportion of endangered plants



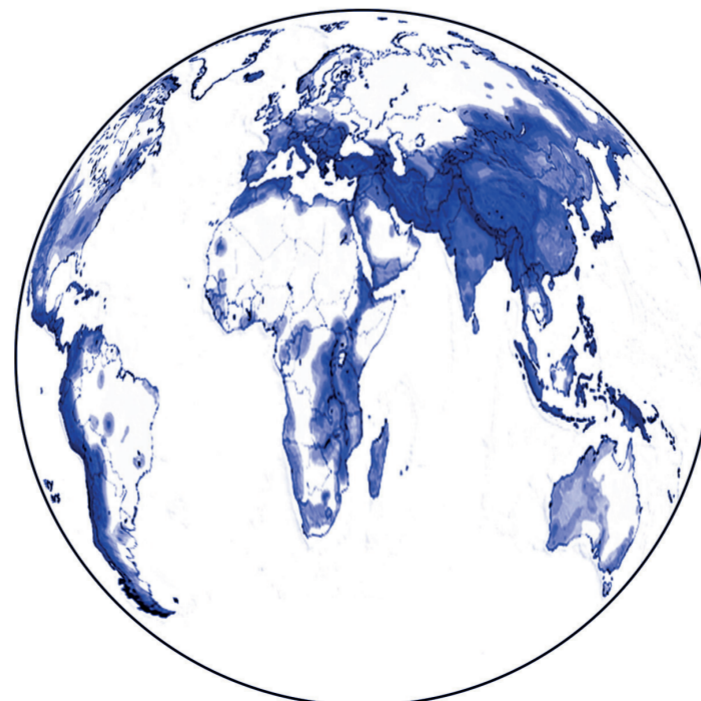
Pollution and air movements



Nature of geological zones

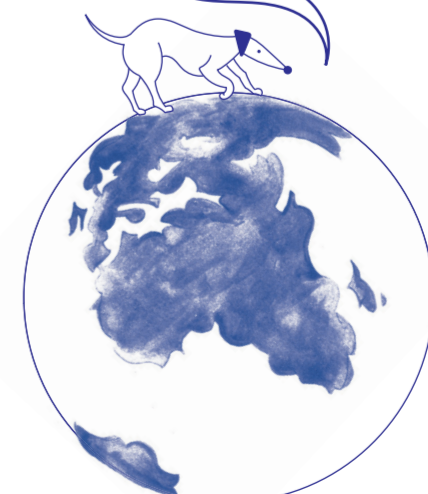


Water levels



Seismic risks

What about you,
how do you see
the Earth?



Pale blue dot

Captured by the Voyager 1 satellite on February 14th, 1990, the «Pale Blue Dot» photograph remains the most distant image of Earth ever taken, nearly 6 billion kilometers away. Seen through the cameras of the time, it is reduced to a few pixels only.

