

The atmosphere

Mars

Polar ice caps:
Water ice and
carbon dioxide ice
(called "dry ice")

95 %

carbon dioxide (CO_2),
with a little nitrogen
and argon. Oxygen
represents only 0.13%
and water vapor 0.03%.

- Impossible to breathe.
- Liquid water cannot stay on the surface.

The atmosphere is
much thinner than
Earth's: the pressure is

**150 to
200 x**
lower

Water exists as **ice** or very
thin vapor.

Like Earth, Mars has **seasons due to the tilt of its axis**. Temperatures go from $-14^{\circ}C$ in summer to $-120^{\circ}C$ in winter, with an average of about $-60^{\circ}C$. Ice caps are therefore **naturally found at the poles**.

Sublimation



No atmosphere
=
No protective blanket
to keep water



And just like that,
ice turns **directly**
into water vapor:
this is
sublimation

Robots searching
for ice

2008

Phoenix Mission

Main goal: Study the Arctic region of Mars, near the polar ice cap.

Major discovery: Phoenix confirmed **the presence of water ice** in Martian soil by photographing it over several days and watching **it sublimate**.

Other results: the probe observed Martian snowfall and showed that water can move between the atmosphere and the ground.

Importance: this mission proved that Mars still contains water in the form of ice, which is essential for understanding its climate and potential habitability.

Since 2021

Perseverance Mission

Exploration site: Jezero Crater, which once contained a lake and a delta formed by water.

Main goal: search for signs of past water activity and collect rock samples.

Recent discoveries:

Perseverance identified minerals such as kaolinite (clay), which formed in the presence of liquid water in the past.

Importance: by studying these rocks, scientists want to understand whether Mars could once have been habitable and if it preserved traces of ancient life.

