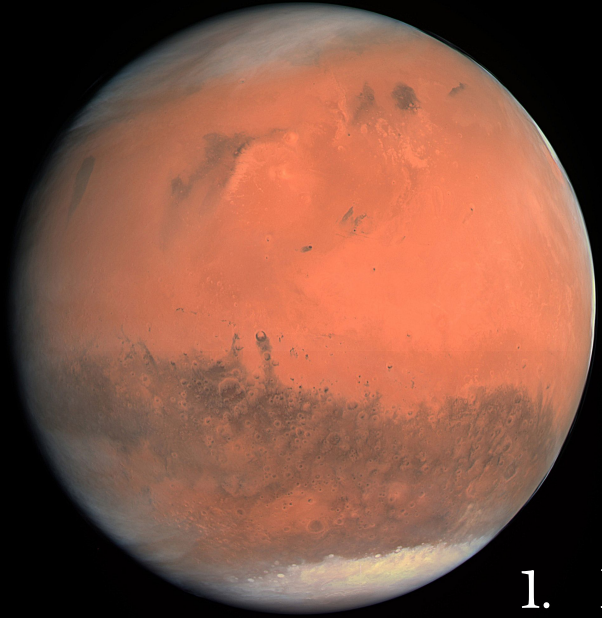


The background is a stylized illustration of the Martian surface. It features a large, bright orange sun in the upper left corner, casting a warm glow over the scene. The sky is a deep red-orange, dotted with small white stars. The foreground and middle ground consist of rolling, dark red and orange-brown hills and valleys, suggesting a barren, rocky landscape. The overall color palette is dominated by warm, earthy tones of red, orange, and yellow.

How And When Did Mars Lose Its Water?


Andre Beikircher & Sana Akhter



Why it's important to study about Mars

...

1. Helps us to understand planetary evolution
2. We can better understand our own world
3. Mars--our future home?

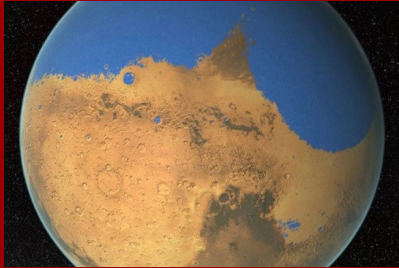


How did we find out? What did we need?

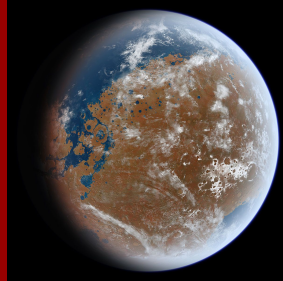
- Geological Change in Mars' Surface
- The Change in Mars' Atmosphere and its Magnetic Field
- Changes in Surface and Core Temperatures Over Time

What did Mars look like before?

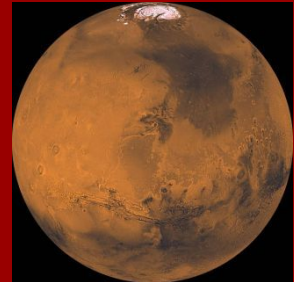
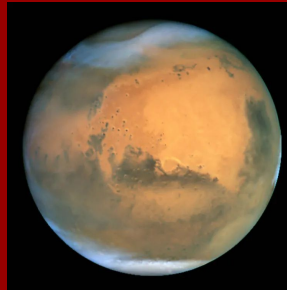
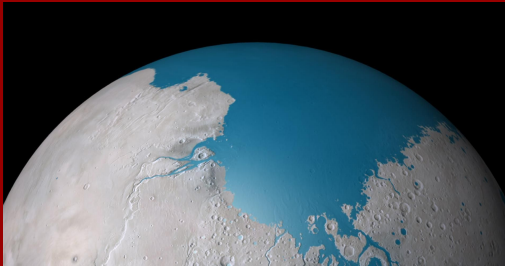
3.8 billion years ago



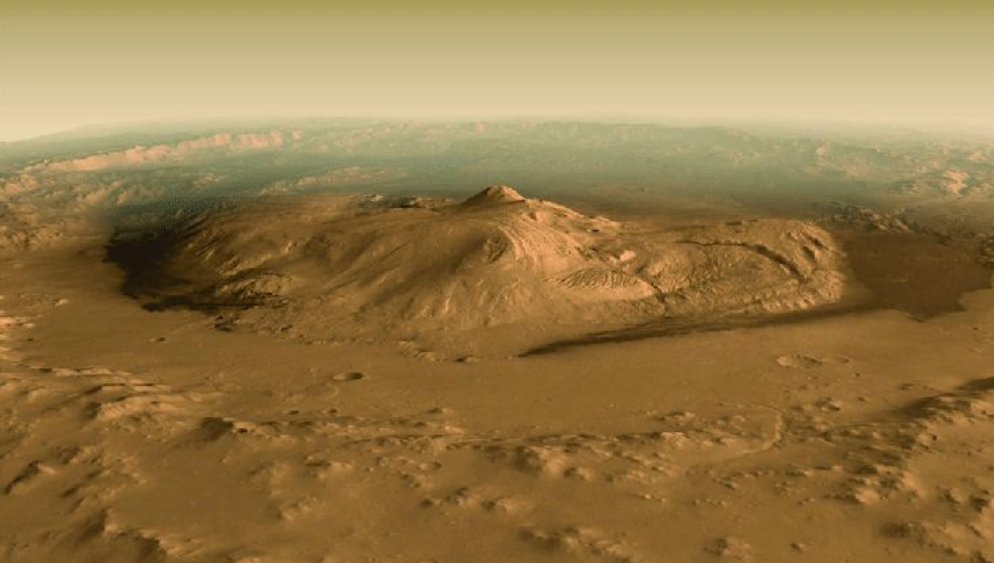
3.5 billion years ago



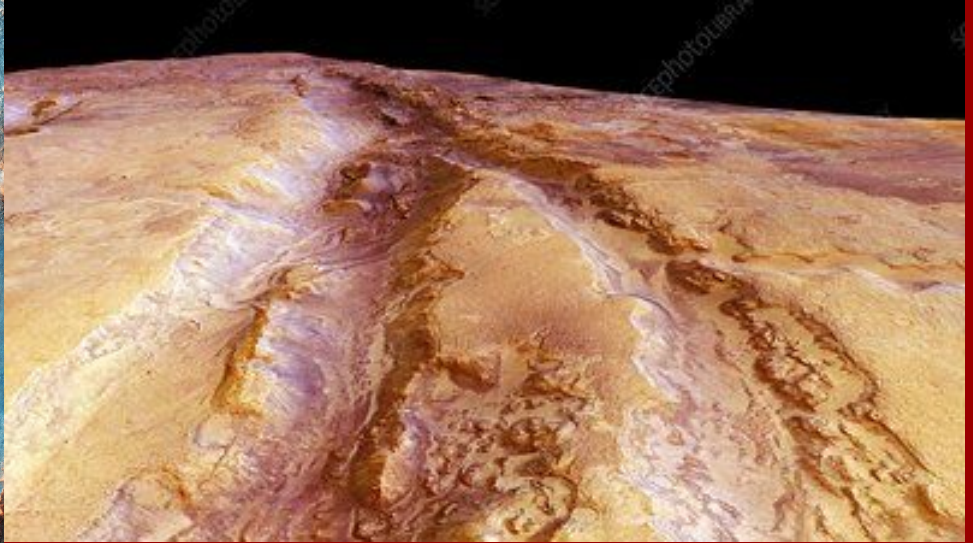
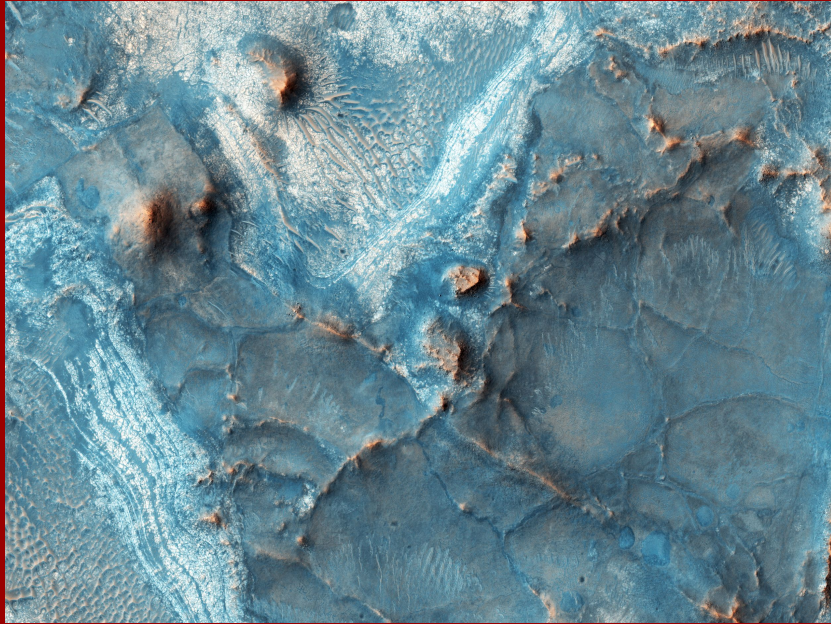
- Today



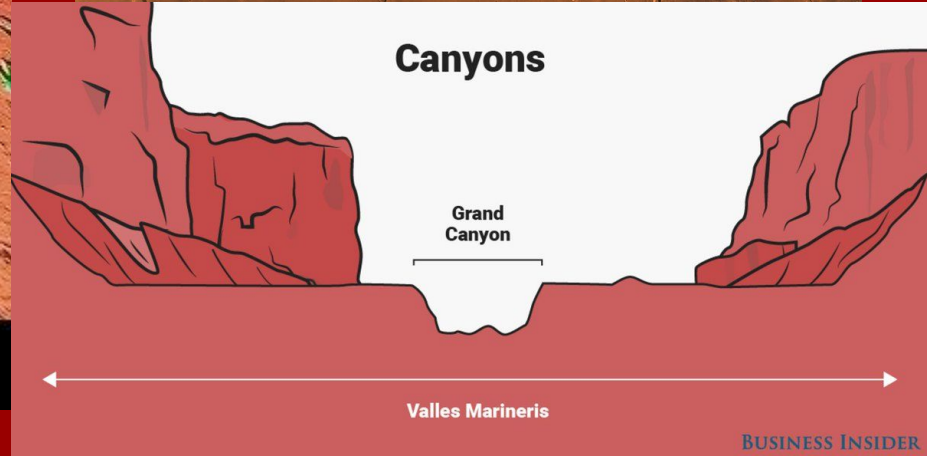
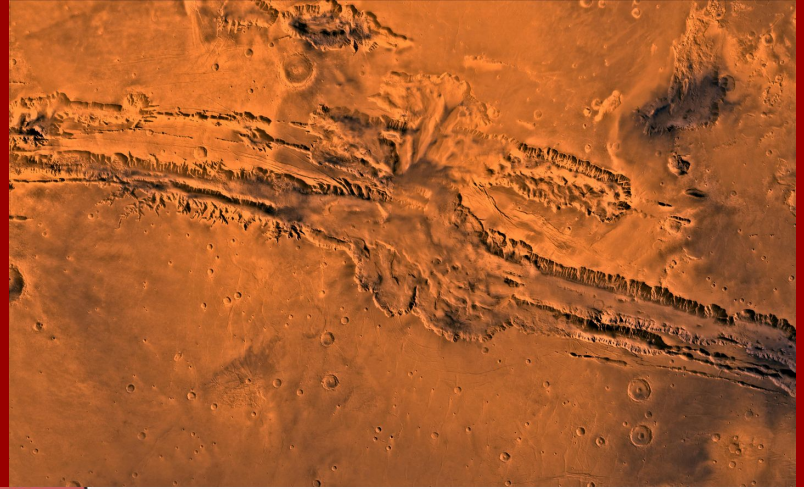
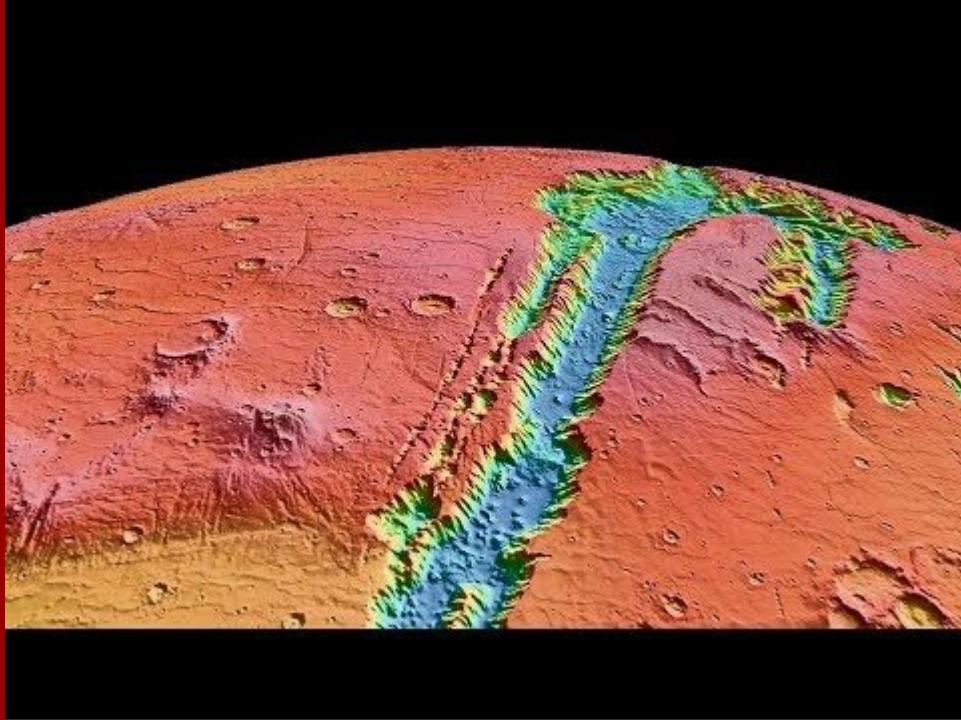
Landmark #1: Gale Crater



Landmark #2: Nili Fossae



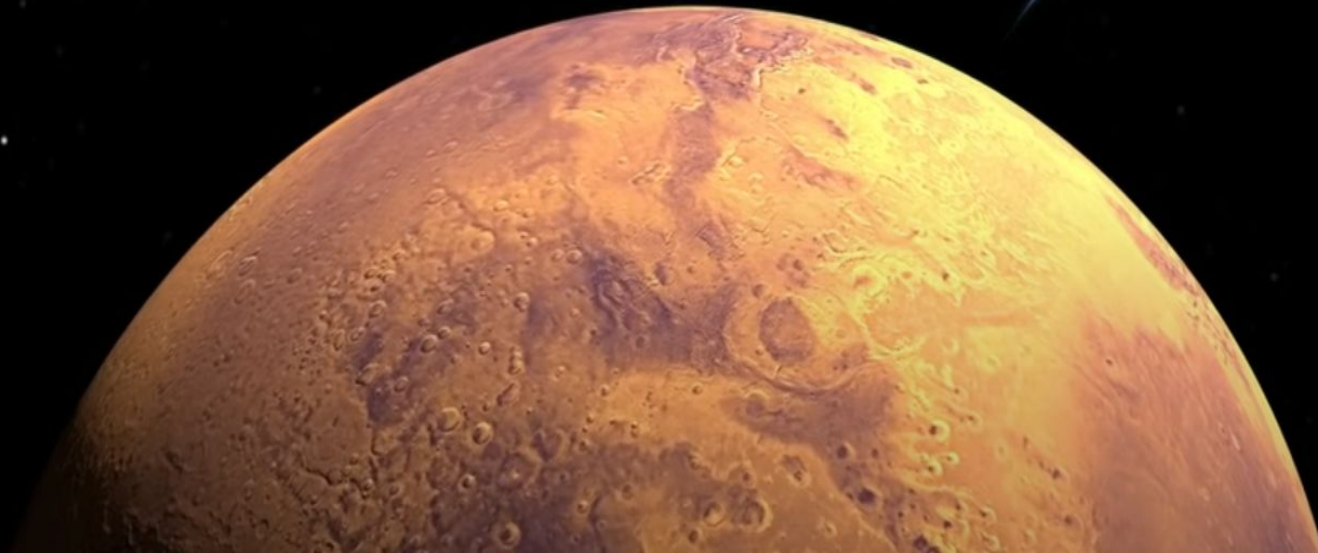
Landmark #3: Valles Marineris





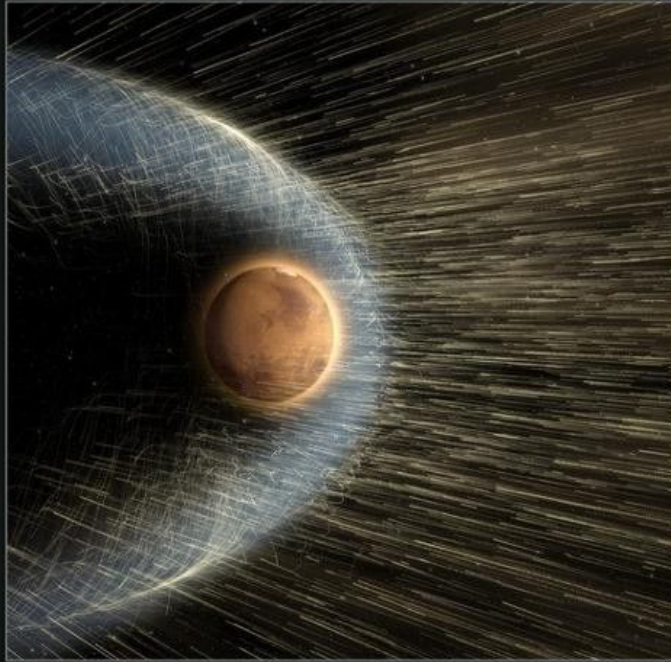
Atoms are knocked from
atmosphere bc of these energetic
particles from sun

Sputtering effect

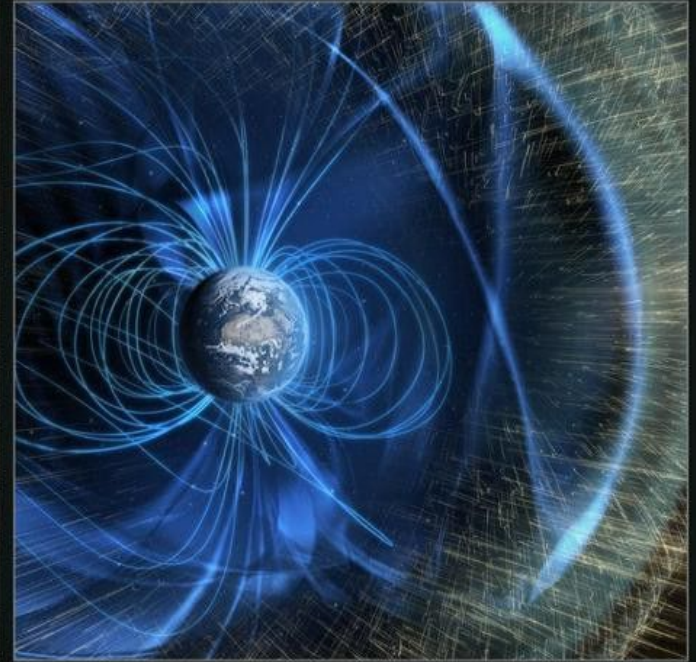


Magnetic Field

1. Protects planet
2. Maintains climate

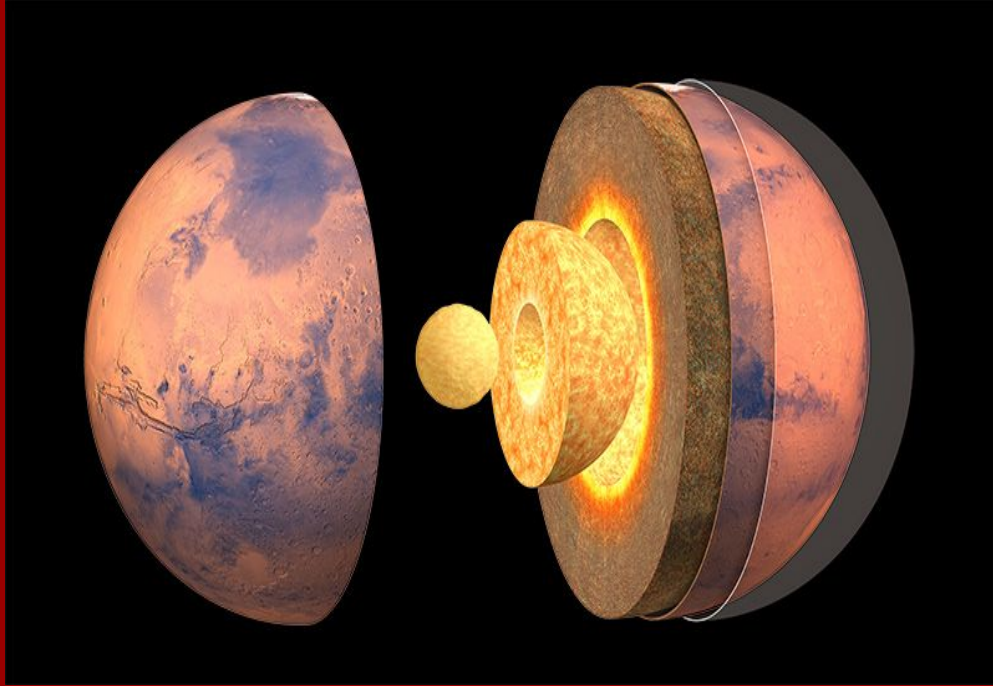


Mars



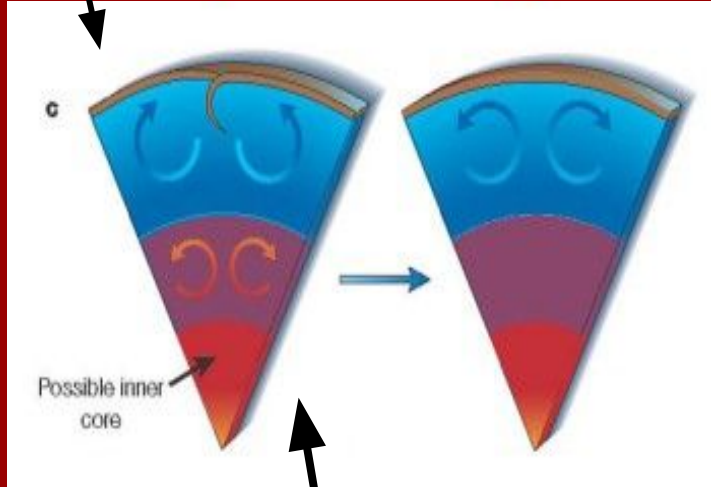
Earth

Mars' interior ?



1. Thin, rocky crust
2. Mantle
3. Metal core
(liquid/solid?)

mantle



core

Two models of the core's development

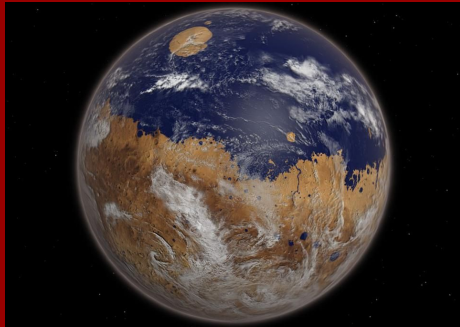
1. Liquid core cooled and became solid and wiped out magnetic field
2. Mantle stopped generating heat

Atmospheric composition of Mars vs Earth

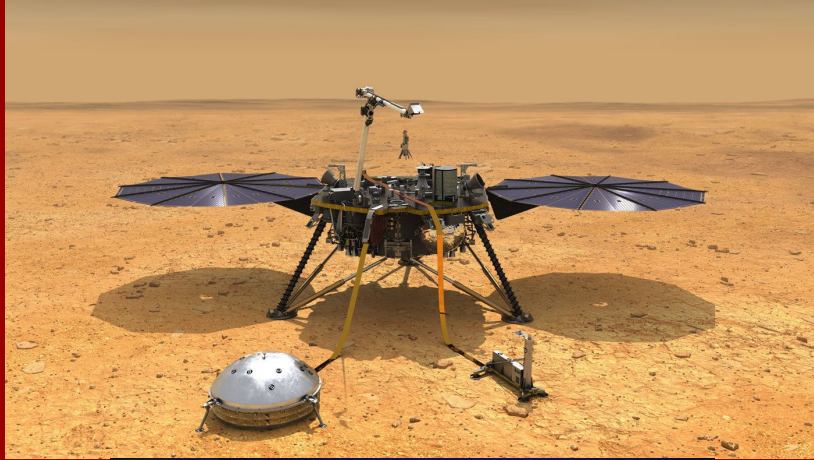
Dominant Gases	Mars	Earth
Carbon dioxide (CO ₂)	96%	0.0391%
Nitrogen	1.9%	78.1%
Oxygen	0.174%	20.9%
Argon	1.9%	0.93%

How long ago did Mars lose its liquid water?

- Approx. 2 - 4.5 billion years ago. (Estimation) How do we know?
 - According to data from SOFIA, Mars once had an ocean 3.6 m deep and lost 94% of its water 4.5 billion years ago..
 - The Valles Marineris stopped increasing in size, because of heavy flooding around 2 billion years ago.
 - Mars lost most of its once dense atmosphere 3 billion years ago.



Insight Mission: What's going on right now

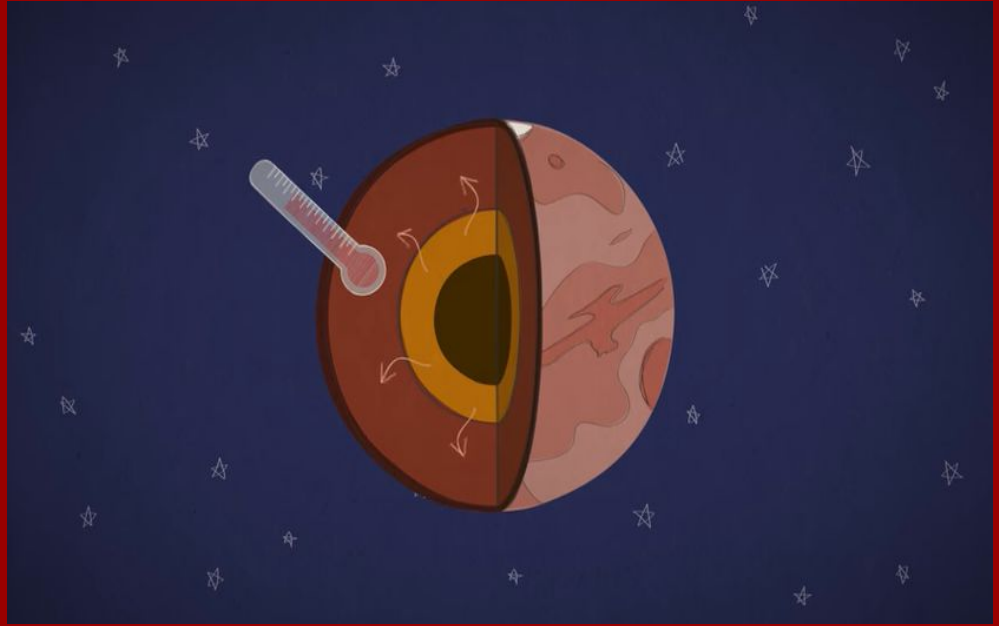


Objective: to study the interior structure of Mars as well as the present geological activity on Mars.

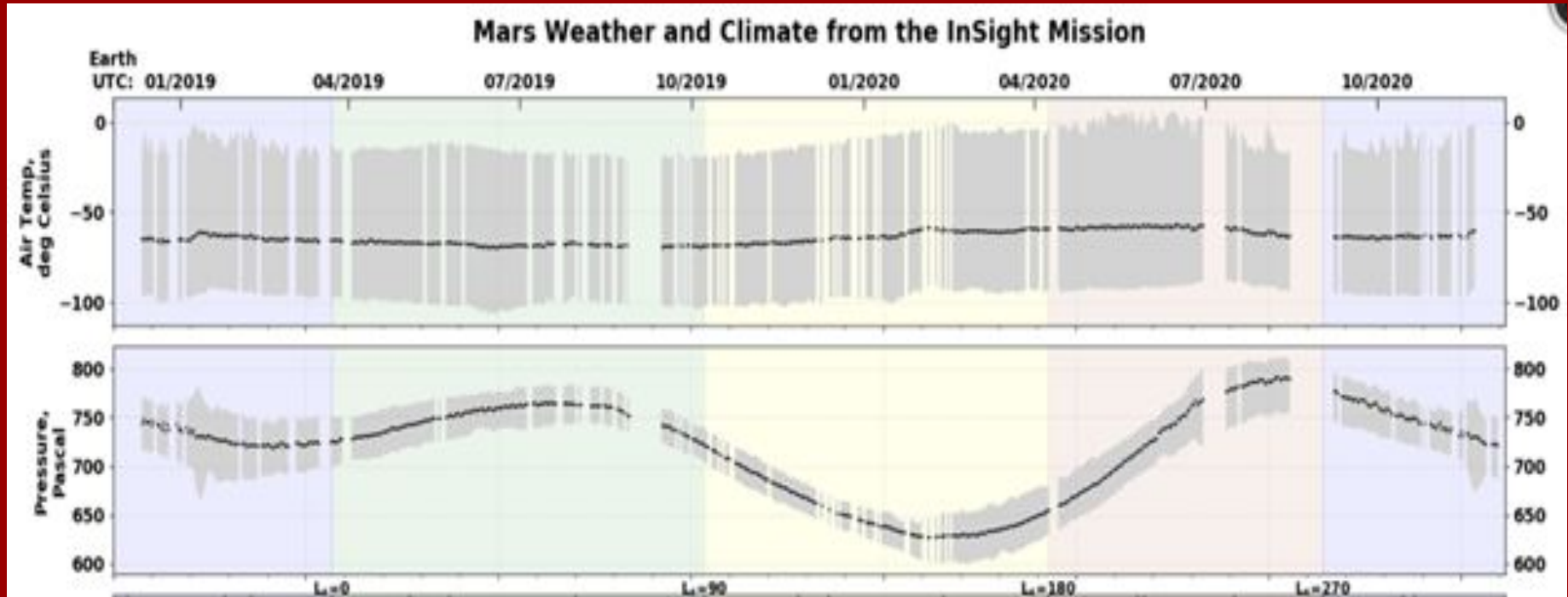


1. Taking its temperature-
to see how much heat is flowing
2. Listening to its pulse-
are there marsquakes?
3. Check its reflexes-
See how much the planet
wobbles

Insight plans to give Mars its first formal checkup



Insight tracks Mars Current Climate



Conclusion - Results

- No concrete answer behind when Mars lost its water.
- The atmospheric pressure and temperature are not suitable for water to flow.
- The necessary data about the core's temperature and how it changed over time to see when the water left the surface is not yet available.

Questions