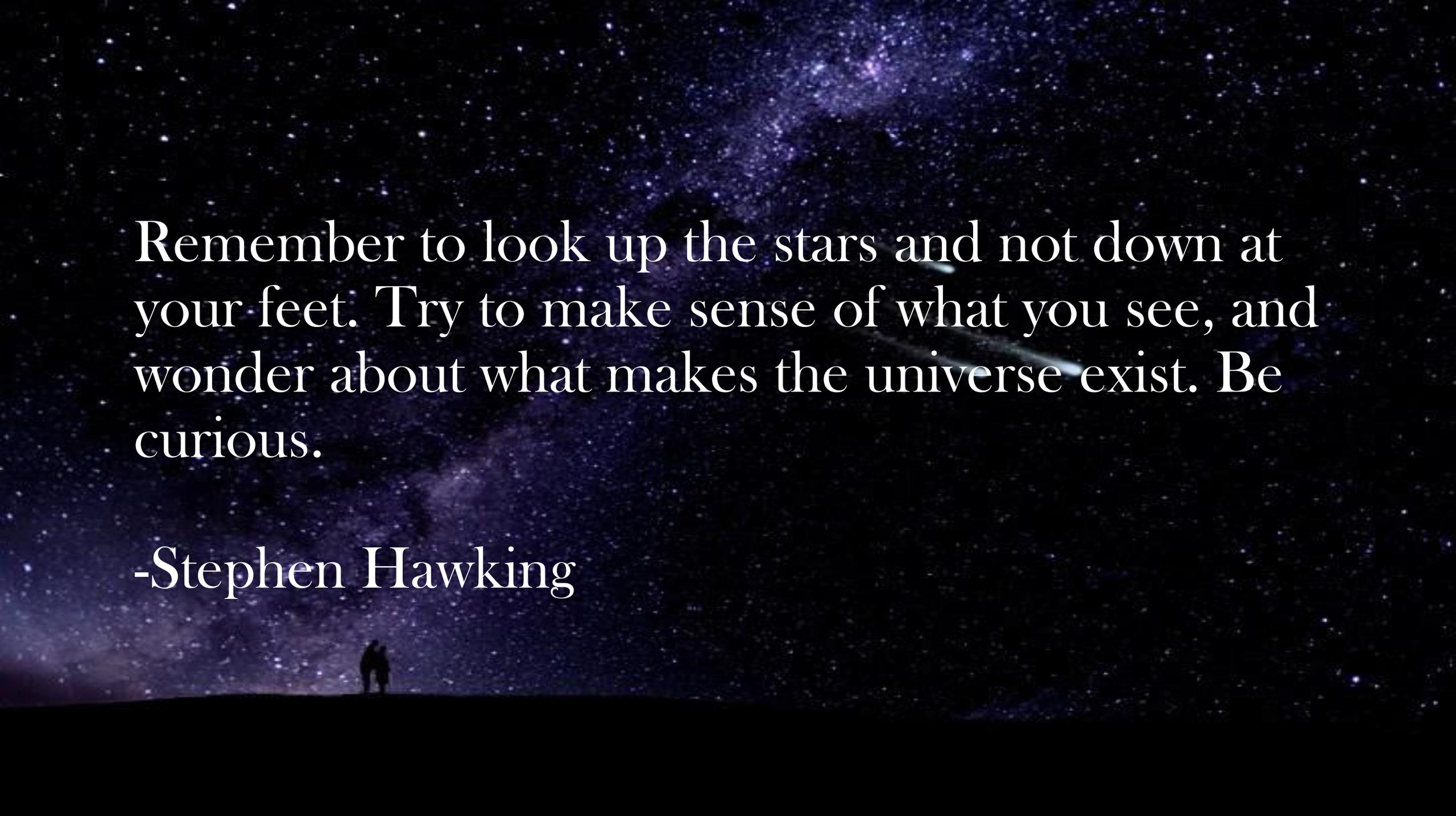


WHEN IT ALL BEGAN

*An interdisciplinary journey into
man's eternal desire for exploration.*

A night sky filled with stars and a faint, glowing band of light, likely the Milky Way. In the lower center, the dark silhouette of two people standing on a hill is visible against the starry background.

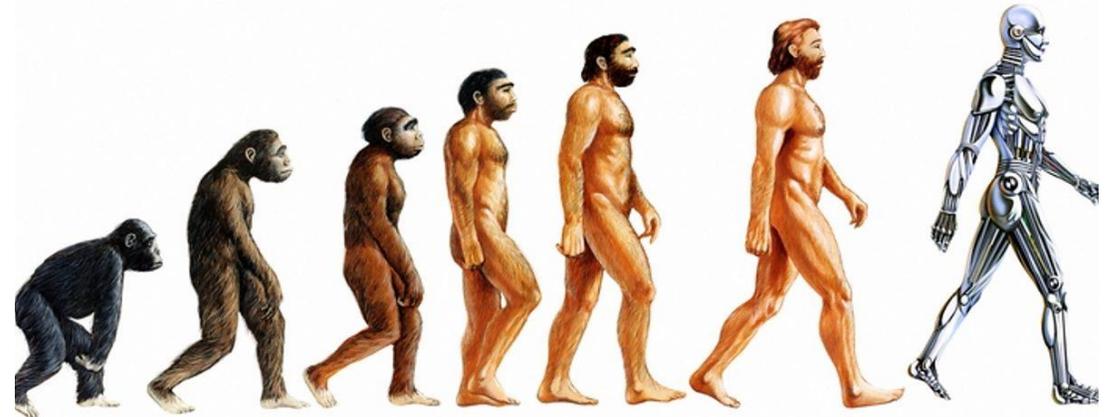
Remember to look up the stars and not down at your feet. Try to make sense of what you see, and wonder about what makes the universe exist. Be curious.

-Stephen Hawking

Humans and the Universe

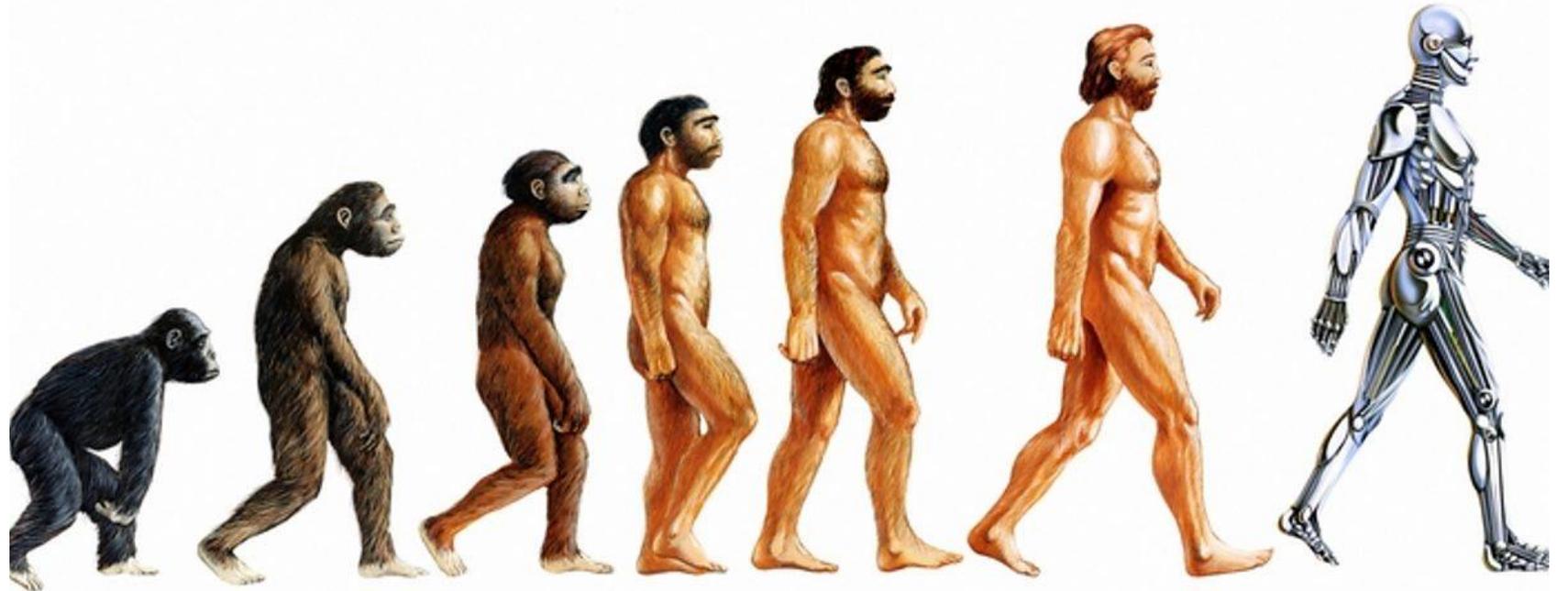
When the man paused to contemplate the sky, his inner world of fears, worries and anxieties for a harsh and precarious life was enriched with the awareness of his existence in the Center of something arcane and mysterious that he called **UNIVERSE**.

Since the most ancient times, man imagined the universe as a harmony of concentric spheres, tending to a greater degree of perfection.



The multiplicity and the apparent independence of the movements observed in the sky, led to the spread of rich mythologies of gods and demigods.

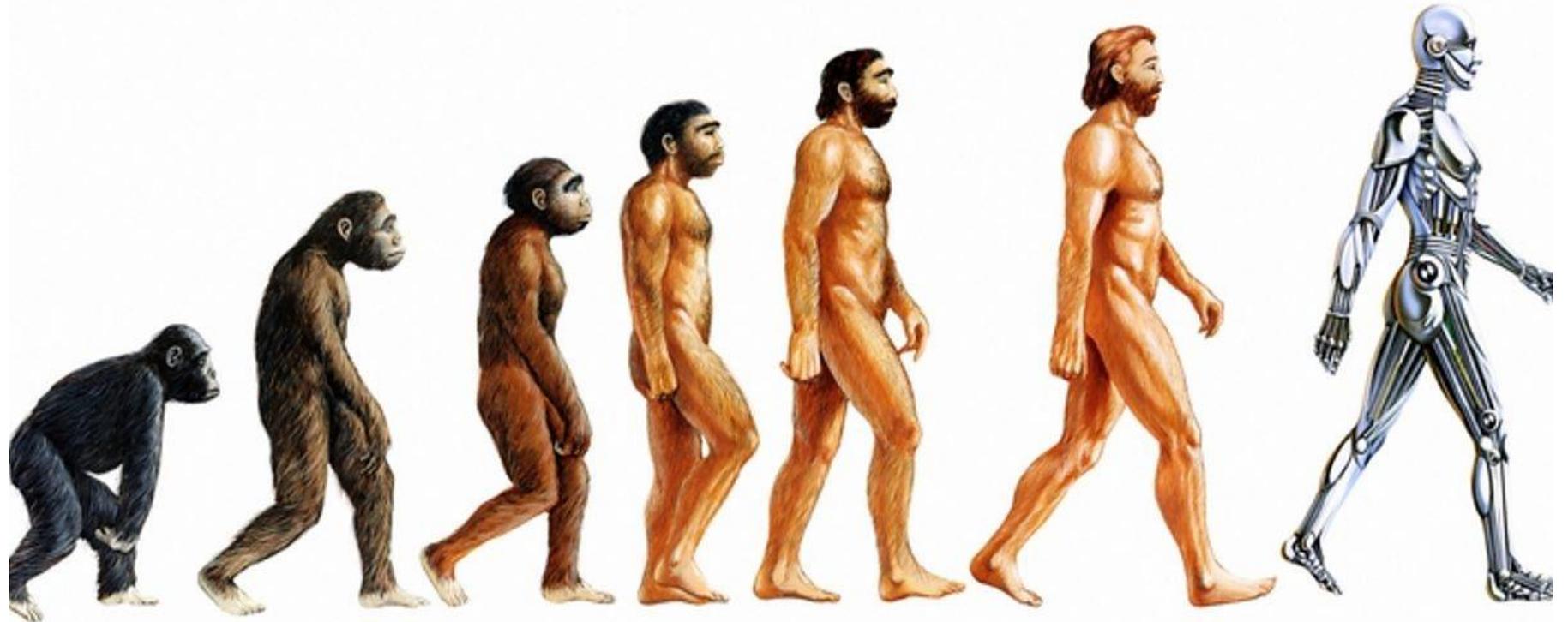
Polytheists are the Babylonians, the Egyptians, the Chinese, the Indians and even the Greeks, until the formation of a more advanced philosophical and religious consciousness.

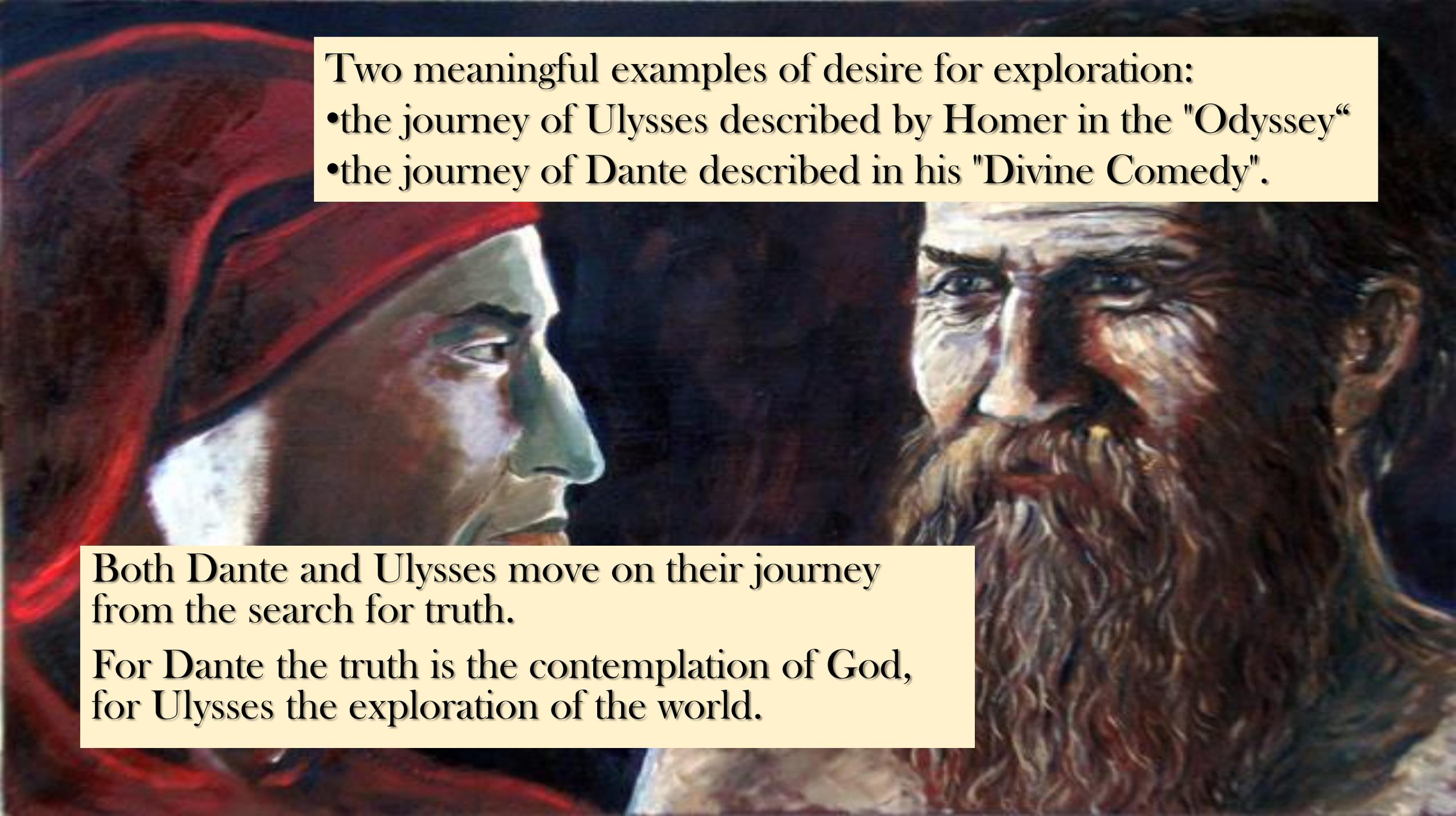


A characteristic common to all primitive astronomical systems was given by the clear distinction between Heaven and Earth.

In these conceptions **knowledge** was assigned to the **sky**, **ignorance** was assigned to the **Earth**.

Humans have always tried to tear down the limits imposed by the space trying to reach the boundaries of knowledge.





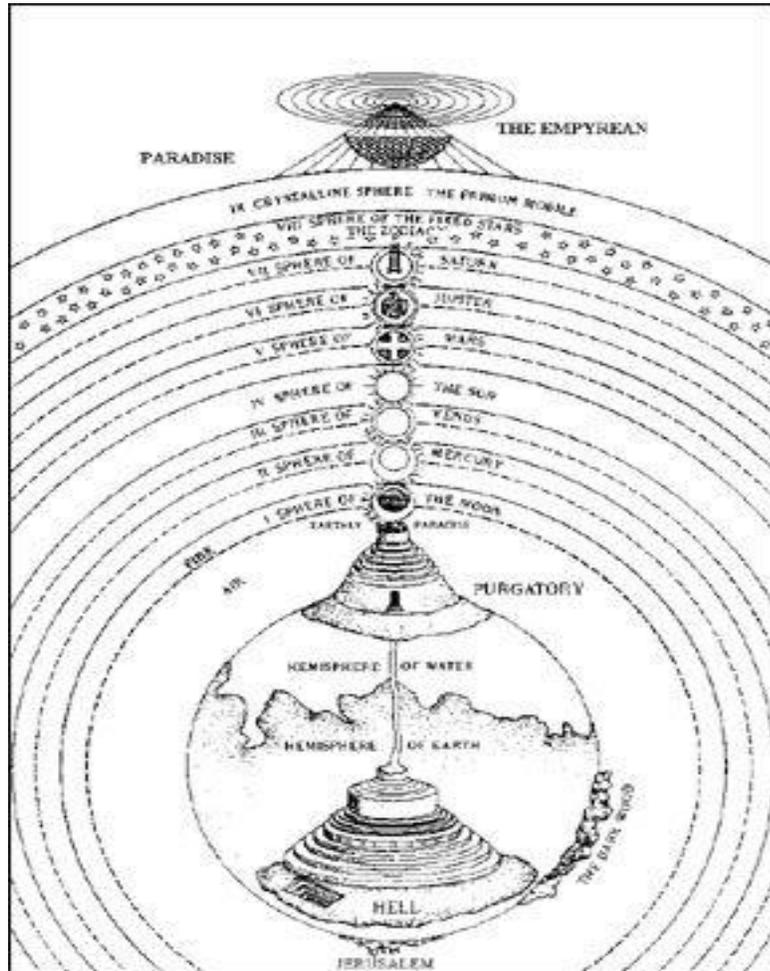
Two meaningful examples of desire for exploration:

- the journey of Ulysses described by Homer in the "Odyssey"
- the journey of Dante described in his "Divine Comedy".

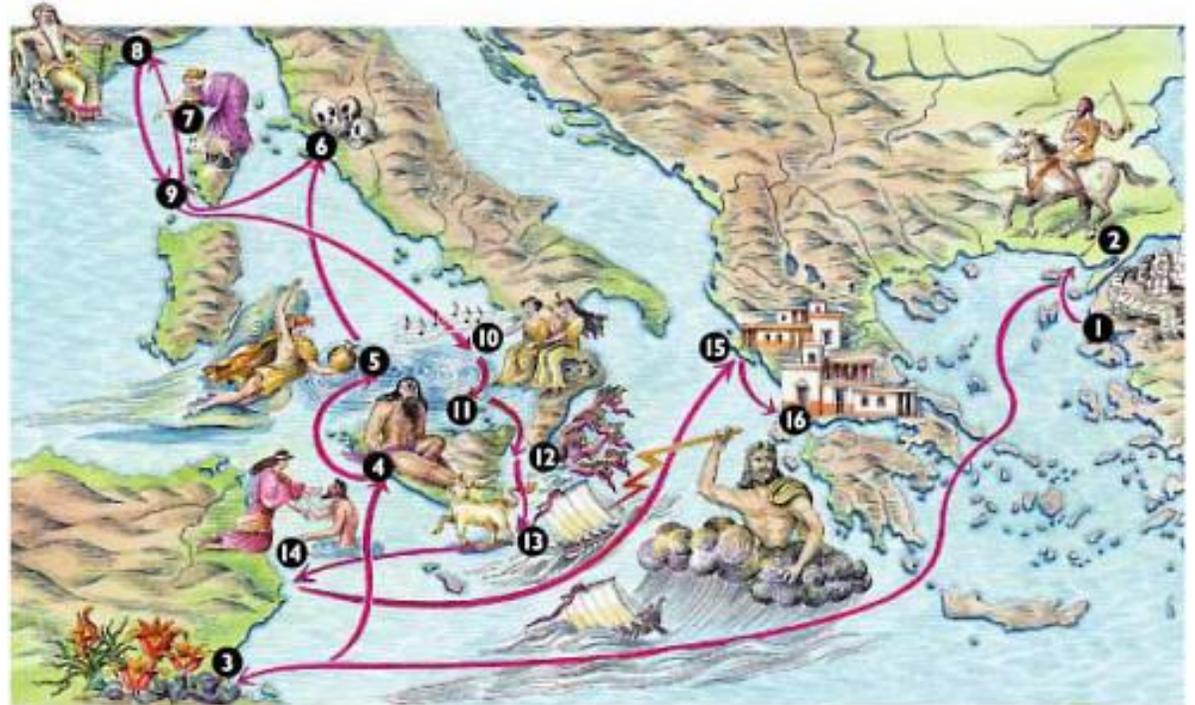
Both Dante and Ulysses move on their journey from the search for truth.

For Dante the truth is the contemplation of God, for Ulysses the exploration of the world.

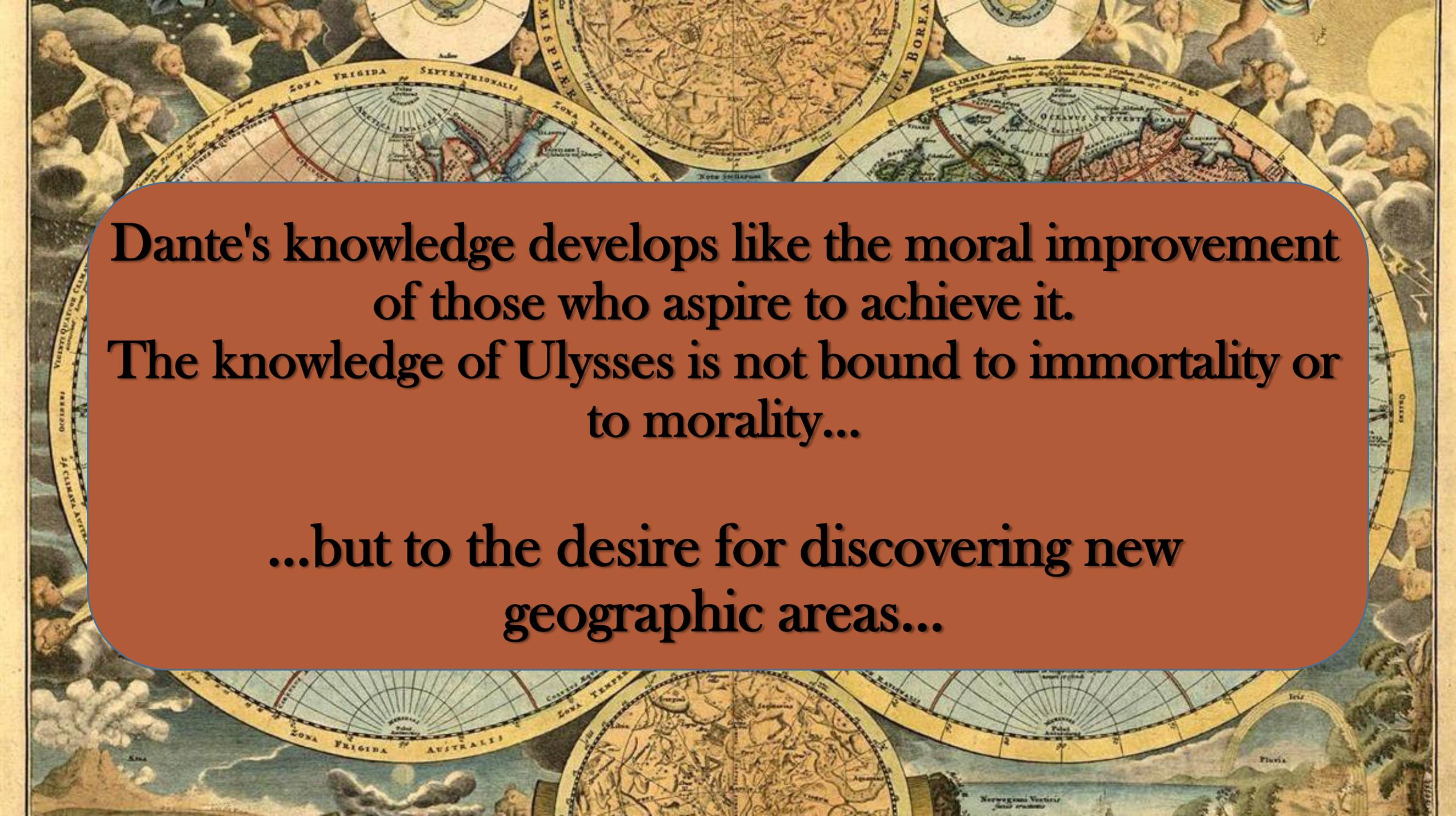
Dante's journey



Ulysses's journey



- | | | | |
|----------------|--------------------------------------|--------------|--------------|
| 1 Troy | 5 Island of Aeolia | 9 Circe | 13 Thrinakia |
| 2 Cicones | 6 Laestrygonians | 10 Sirens | 14 Calypso |
| 3 Lotus Eaters | 7 Circe | 11 Charybdis | 15 Phaeacia |
| 4 Cyclops | 8 Teiresias and the Land of the Dead | 12 Scylla | 16 Ithaca |



Dante's knowledge develops like the moral improvement
of those who aspire to achieve it.
The knowledge of Ulysses is not bound to immortality or
to morality...

...but to the desire for discovering new
geographic areas...

The discovery and the colonization of America



Everything began from the desire to reach the East. Actually the man wanted to broaden his horizons not only in space but also in his knowledge, and wanted to know something new and mysterious, something he only knew through the legends.

The discovery of America is attributed to Cristoforo Colombo in 1492, but in this period a lot of adventurers sailed the high waters of the Oceans...

SPANISH AND PORTUGUESE EXPLORATIONS, 1400-1600

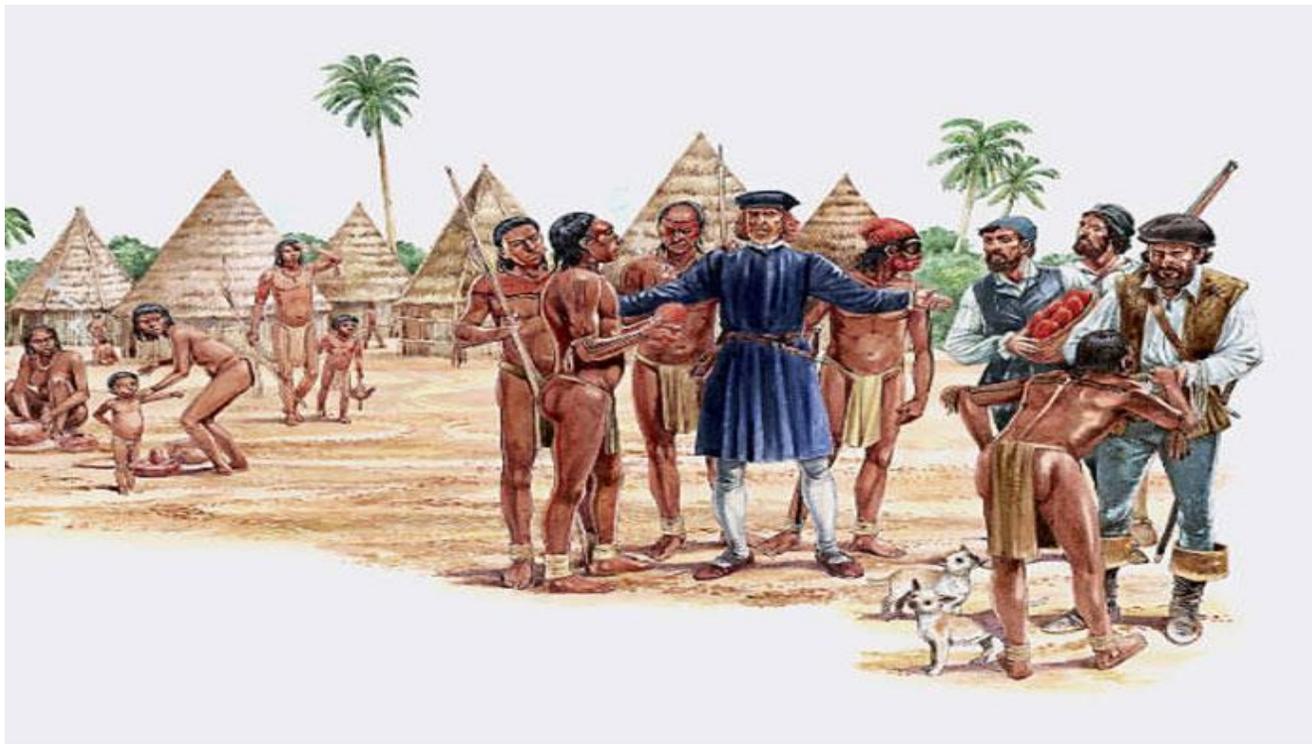
- Spanish claims, c. 1550
- Portuguese claims, c. 1550



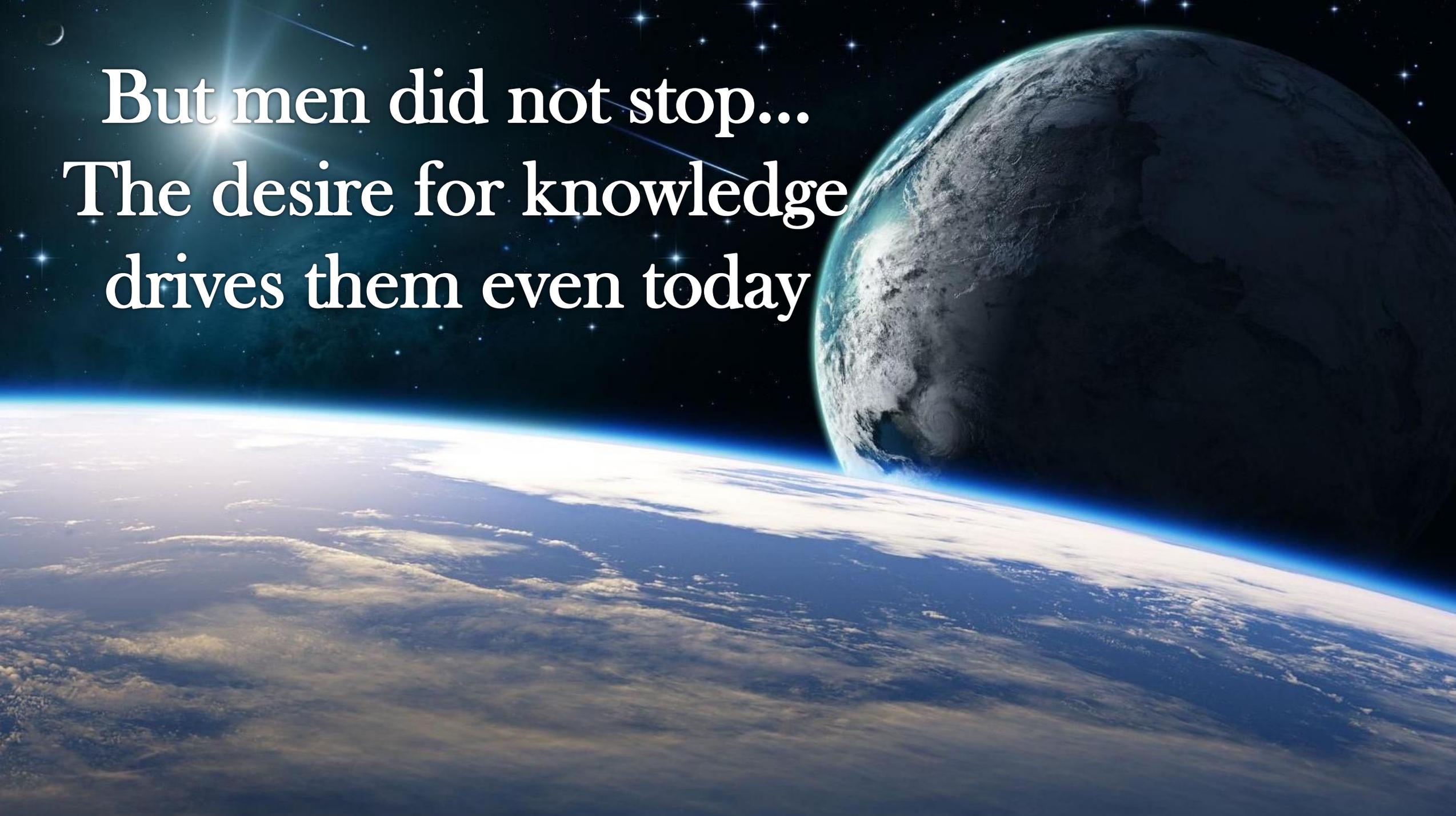
Conquistadores' mentality

The first shipments to America were caused by the need of finding a new way to reach the East and trade with the populations.

Since in the Bible there was no information about the natives, the Conquistadores did not consider them as humans, so they justified the use of violence.



But men did not stop...
The desire for knowledge
drives them even today





Man on the Moon

Humans arrived on the Moon on July 20 1969 at the peak of a space race between URSS and the USA. The first spaceman who arrived on the Moon was **Neil Armstrong**.

He was an American astronaut, aerospace engineer, naval aviator, test pilot, and university professor. He made two trips in space, but what made him famous was the 2nd trip.

The last man arrived on the Moon was Eugene Cernan. Captain Eugene Andrew "Gene" Cernan was an American astronaut, naval aviator, electrical and aeronautical engineer and fighter pilot. He was the protagonist of three missions.

The crew of Apollo 11 left an inscription on a plate in which there is this phrase: "Here men from the Planet Earth first set foot upon the moon, July 1969 A.D. We came in peace for all mankind."





But space exploration has just started...

Space colonization

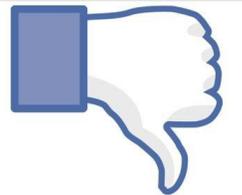
Space colonization is permanent human habitation off the planet Earth.

Many arguments have been made for and against space colonization.

On the one hand it would lead to the survival of human civilization and of the biosphere in case of a planetary-scale disaster (natural or man-made).



On the other hand it could likely enhance the interests of the major economic and military institutions, and increase pre-existing problems such as wars, economic inequality, and environmental degradation.



Mars

Mars is the second-smallest planet in the Solar System, after Mercury. Named after the Roman god of war, it is often referred to as the "Red Planet" because the iron oxide prevailing in its surface gives it a reddish appearance.



ID of Mars

- Aphelion 1.6660 AU
- Perihelion 1.3814 AU
- Semi-major axis 1.523679 AU
- Eccentricity 0.0934
- Satellites 2
- Inclination 1.850° to ecliptic
5.65° to Sun's equator
1.67° to invariable plane
- Orbital period 1.8808 Julian years
686.971 d
668.5991 sols
- Surface pressure 0.636 (0.4–0.87) kPa
0.00628 atm



composition by volume

95.97% carbon dioxide

1.93% argon

1.89% nitrogen

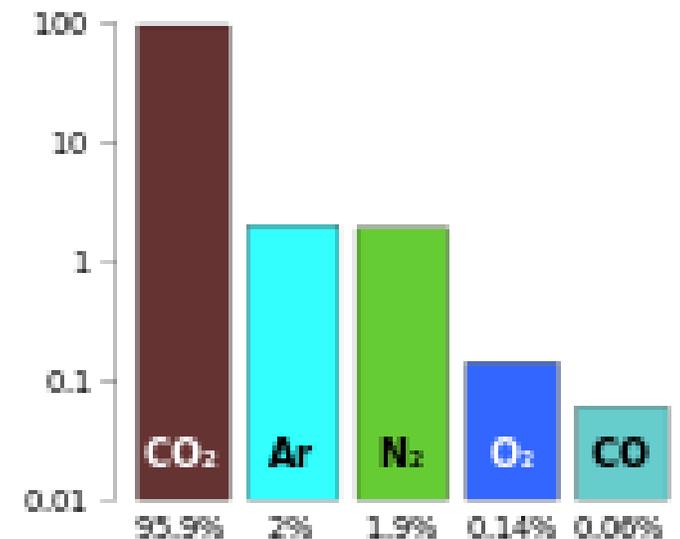
0.146% oxygen

0.0557% carbon monoxide

The Martian surface cannot support life because the atmosphere is too cold and thin.

Currently on Mars we see different structures that look like riverbeds, and we found minerals that are formed only with the presence of water. The Martian climate changed drastically, and in the past Mars was surrounded by a thicker atmosphere that could allow higher temperatures.

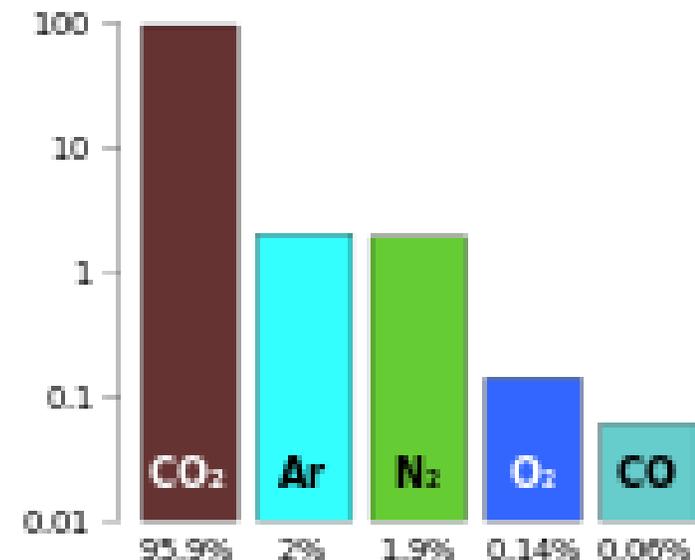
But how did the Martian atmosphere disappear?



Scientists are thinking about two possibilities:

- 1) the gas could have been absorbed by Martian rocks through particular chemical reactions;
- 2) the atmosphere could have been removed by the solar wind, an intense flow of charged particles from the Sun.

It is possible that in a distant past the Martian surface might have hosted elementary forms of lives, like bacteria . But in the meantime the atmosphere became thinner and the planet got colder and desert , deleting life or pushing it down the soil.



Missions to Mars

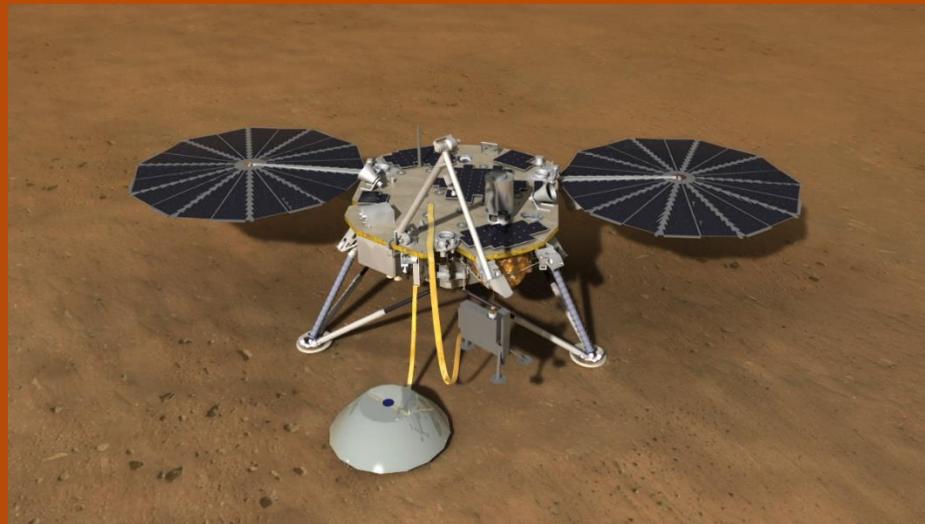
The Martian calendar is full of important events, and many countries all over the world are planning new missions:

- [Insight](#) (Nasa)
- [Red Dragon](#) (SpaceX)
- [Exomars](#) (ESA)
- [Mars 2020](#) (Nasa)
- [China](#)
- [Emirates](#)
- [India](#)



INSIGHT

The Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (Insight) is a robotized probe made by Nasa in 2010, that should have left for Mars this year. But because of a damage at the instrumentation, the launch was postponed to 2018. The mission provides to make land a stationary lander, supplied with different tools, like a seismometer and a thermal sensor, that will allow to examine in details deeper the study of martian geology. The purpose is to study the internal structure of Mars and the processes that contributed to its formation.



RED DRAGON

In 2018 SpaceX will launch their spaceship on the red planet. The first private mission directed to Mars will be needed to test the technologies that Musk's society wants to use to accomplish an even more ambitious goal: a human mission on the planet.



EXOMARS

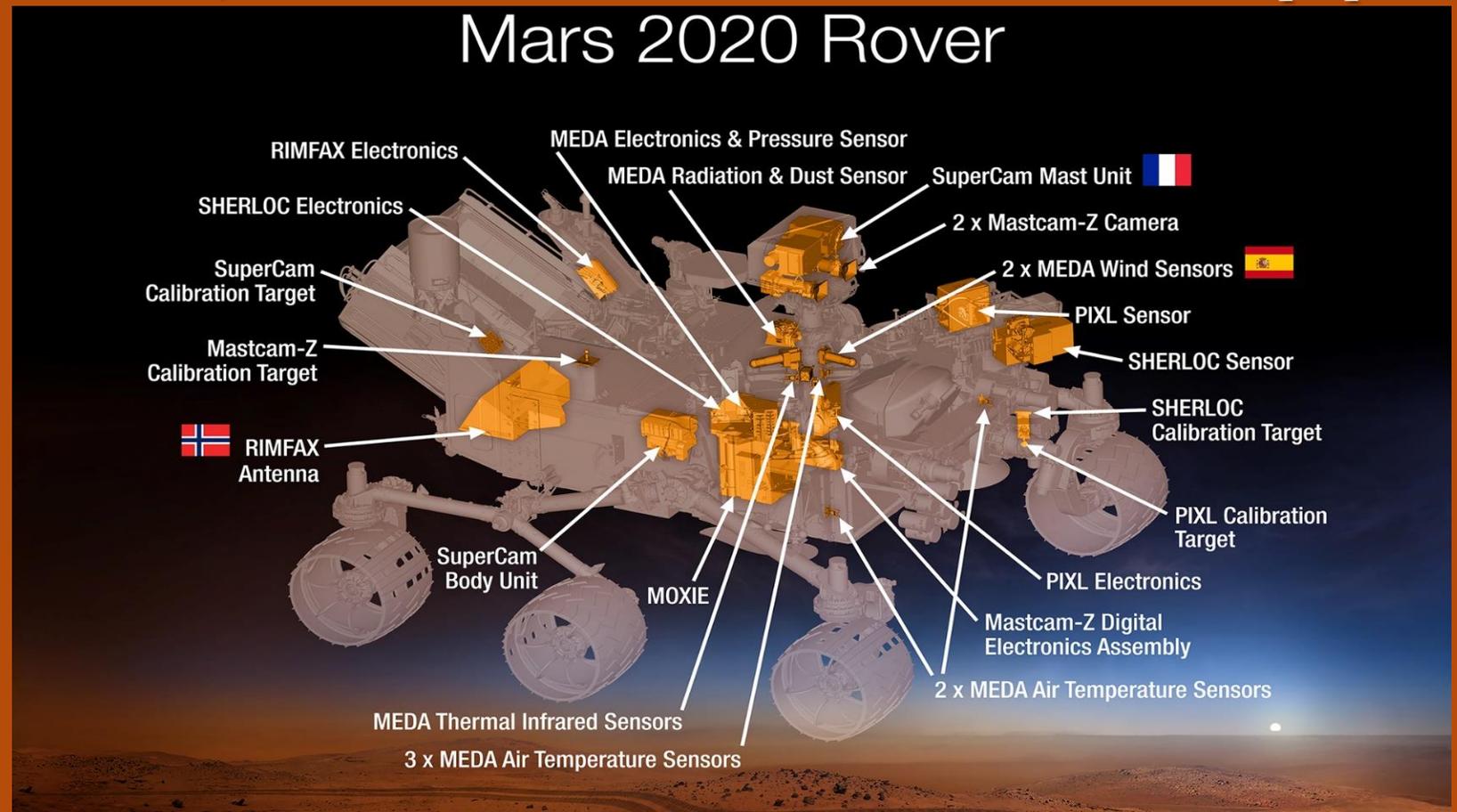
The collaboration between Esa and the Russian agency Roskosmos considers the launch of a space capsule, in which there will be hosted a lander that should land on the planet on 2021. If the lander has much more fortune than its predecessor, it will release a supplied rover with a lab of exobiology that will search the presence of organic molecules and molecular signs of life on the planet.



MARS 2020 ROVER

Next big mission of Nasa, will launch a new rover on Mars surface.

The new rover of NASA will continue on the successes of Curiosity: it will explore the surface of Mars searching for the presence of life alien signs, and it will be the beginning of a series of mission, in which Nasa wants to take a human equipment on the planet.



The Mars 2020 rover has several science objectives all related to the potential of Mars as a place for life:

Looking for Habitability:	Identify past environments capable of supporting microbial life
Seeking Biosignatures:	Seek signs of possible past microbial life in those habitable environments, particularly in special rocks known to preserve signs of life over time
Caching Samples:	Collect core rock and "soil" samples and store them on the Martian surface
Preparing for Humans:	Test oxygen production from the Martian atmosphere



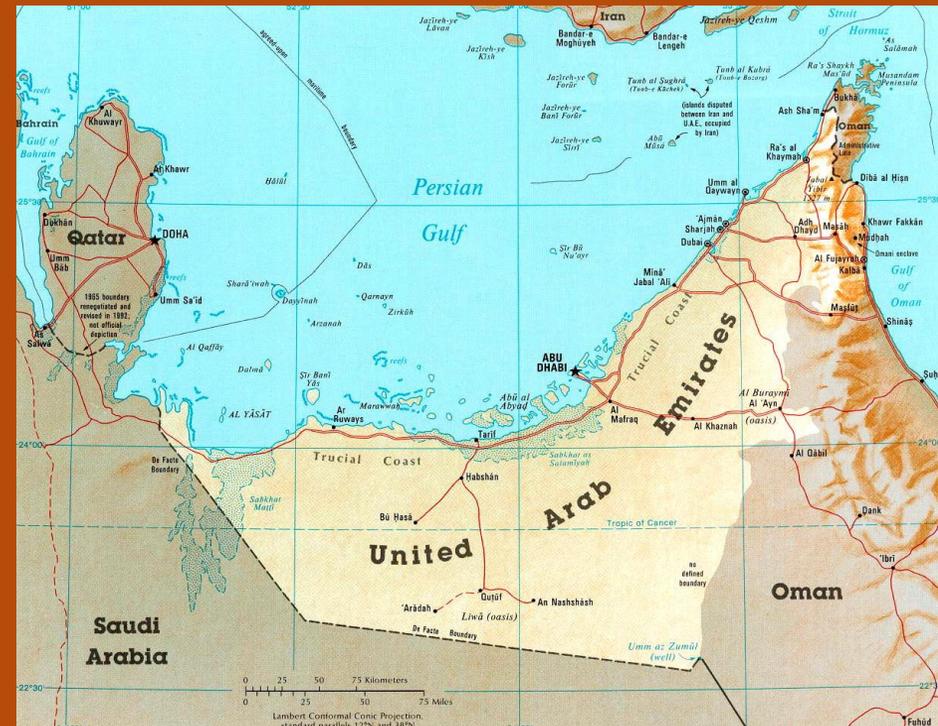
CHINA

The Chinese mission on the red planet will take place between July and August of that same year (2020). A rocket long march 5 will land on the surface of MARS. The probes will take with them some scientific tools, but the mission should be mostly a test in the offing of a more ambitious goal: a shipment estimated for 2030, in which the spacial agency hopes to pick up samples of the Martian soil.



EMIRATES

Even the Arabic Emirates have decided to join the run on Mars. The funds are not a problem and their spatial program, launched on 2014 should produce its first results in 2020: the Hope Probe that should enter the martian orbit in 2021. The scientific purpose will be the study of the planet's atmosphere.



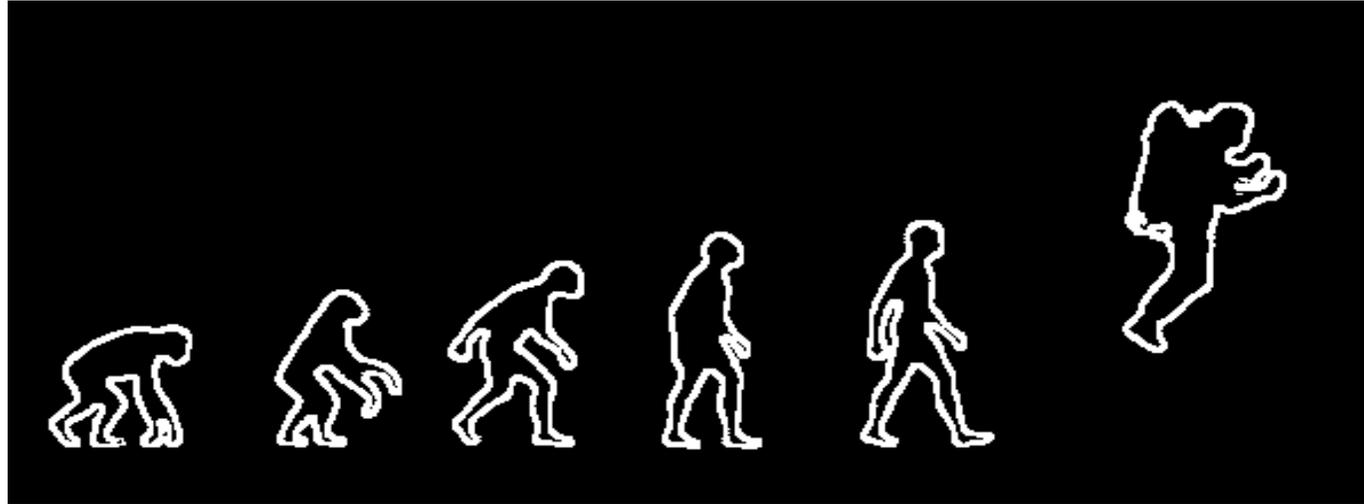
INDIA

The Indian space agency has already put a probe on the martian orbit. This happened in 2014. In 2020 the departure is programmed of the mission Mangalyaan 2, that provides an orbiter and a lander. There are no other details about it.



इसरो ISRO

When will we really go to Mars? We don't know. Yet the 15th September 2035 is a date that fascinates scientists: on that day in fact Mars will be in a position of maximum nearness to our planet.

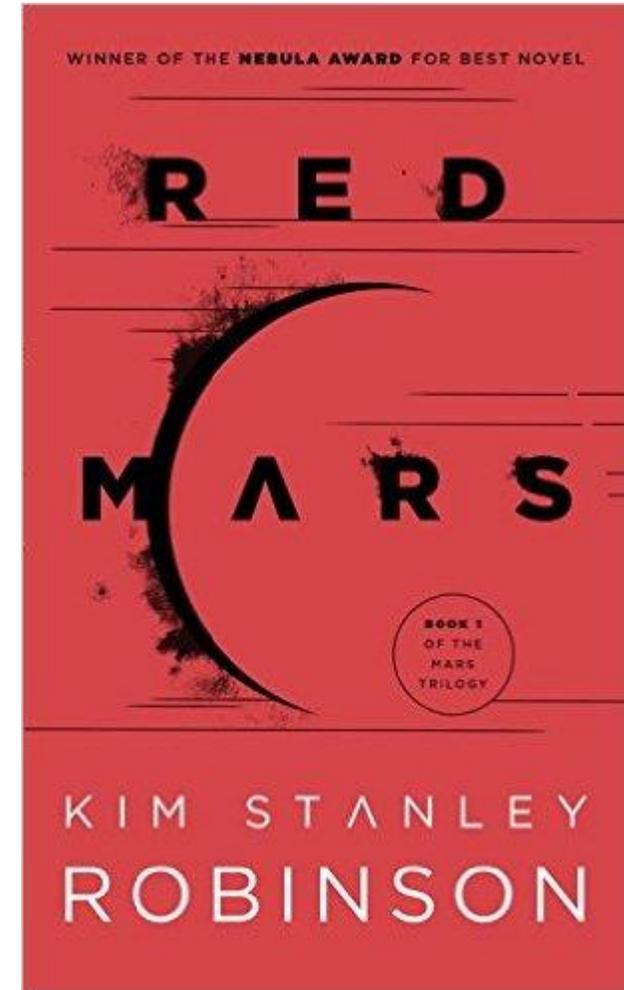
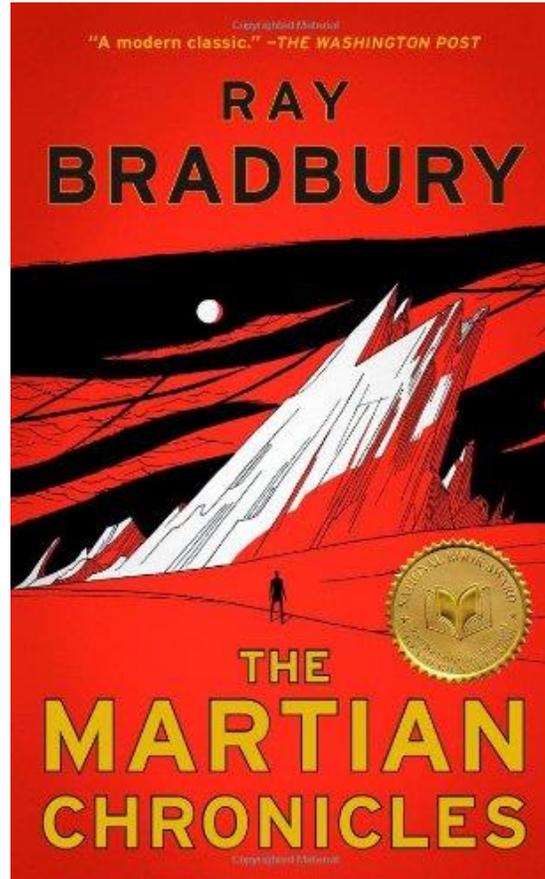
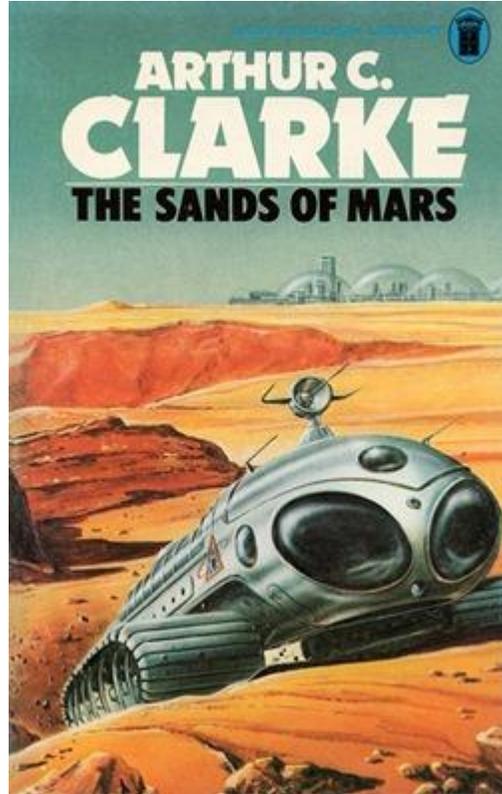


But the fantasy of writers and movie directors has already brought us there...

Movies



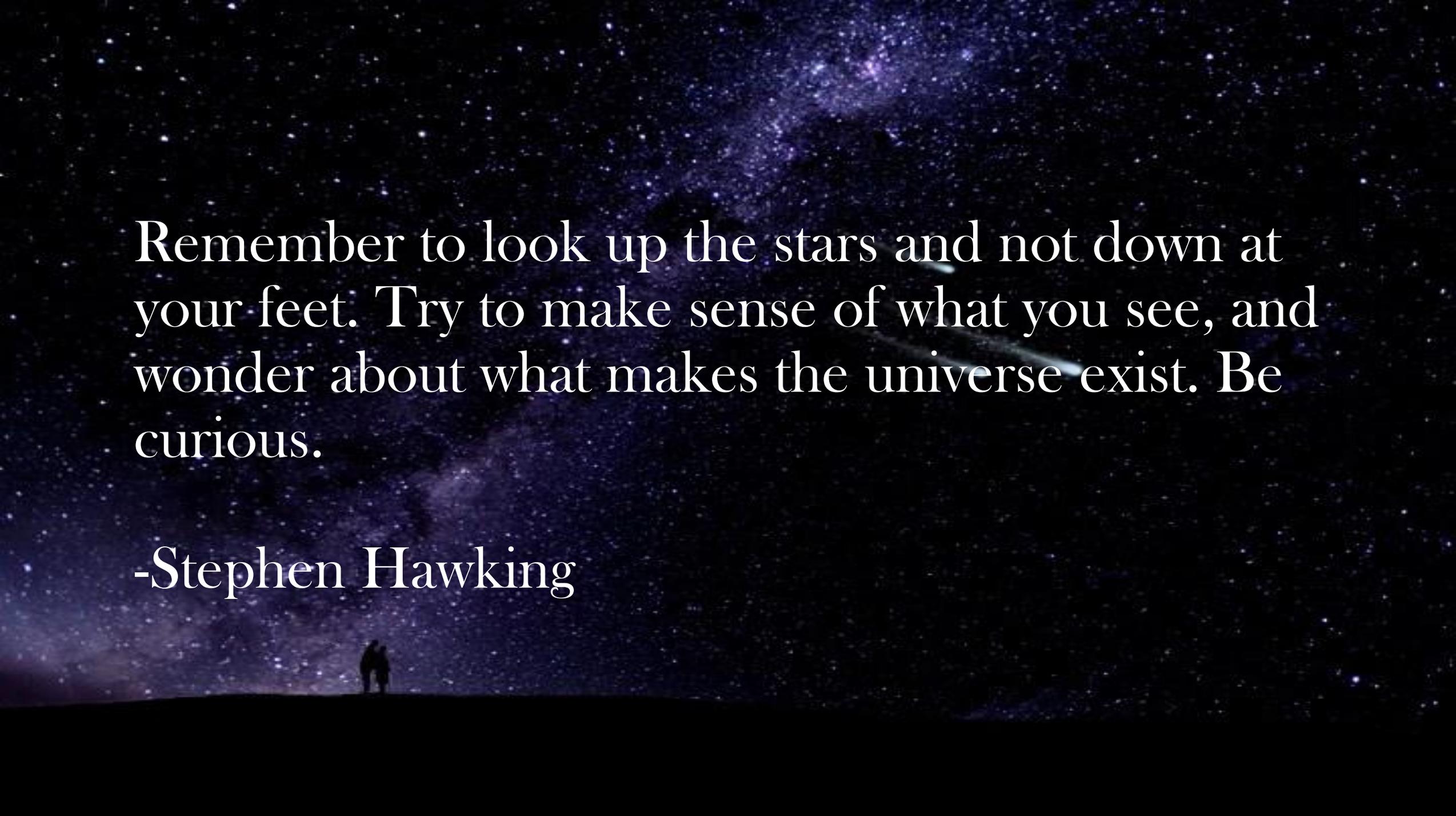
Books





Dealing with space exploration, we decided to read a fantasy book titled “The Martian Chronicles” that is a collection of tales by Ray Bradbury.

[The results of our cooperative work.](#)

A night sky filled with stars and a faint, glowing band of light, likely the Milky Way. In the lower-left foreground, the dark silhouette of two people standing on a hill is visible against the starry background.

Remember to look up the stars and not down at your feet. Try to make sense of what you see, and wonder about what makes the universe exist. Be curious.

-Stephen Hawking



THE END

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