



ExoMars 2022 Mission

For Prelims: ExoMars 2022 Mission, NASA's Perseverance Rover, UAE's Hope Mars Mission, Tianwen-1, China's Mars Mission.

For Mains: Achievements of Indians in Science & Technology.

Why in News?

The **European Space Agency's ExoMars 2022 mission** won't launch in September, 2022 as planned after the agency suspended all cooperation with Russia's space program Roscosmos.

- Earlier, the Russian space agency Roscosmos held that it will not cooperate with Germany on joint experiments in the Russian segment of the [International Space Station \(ISS\)](#).

What is the ExoMars 2022 Mission?

- **About:**

- **It is a two-stage mission:**

- **First Part:**

- Its first mission launched **atop a Proton-M rocket in 2016 and consisted of the European Trace Gas Orbiter** and test lander called Schiaparelli.
 - The orbiter was successful while the test lander failed during its descent to Mars.

- **Second Part:**

- It comprises **a rover and surface platform:**
 - This **second part of the mission** was originally planned for July 2020. But it was postponed until this September due to technical issues.

- **ESA and [National Aeronautics and Space Administration \(NASA\)](#)** were the original ExoMars collaborators, but NASA dropped out in 2012 due to budgeting problems.

- **Russia took NASA's place** in the project in 2013.

- **Objective:**

- The primary aim of the mission is to **check if there has ever been life on Mars** and also understand the history of water on the planet.
 - The European rover will **drill to the sub-surface of Mars** to collect samples from about 2 m of depth.
 - The main goal is to **land ESA's rover at a site** which has high-potential for finding well-preserved organic material, particularly from the history of the planet.

PYQ

Which one of the following planets has the largest number of natural satellites or moons? (2009)

(a) Jupiter

- (b) Mars
 - (c) Saturn
 - (d) Venus
- Ans: (a)

How is the Mission Dependent on Russia?

- The mission **uses a number of Russian-made components** — including the rockets.
 - The 2016 launch used a **Russian-made Proton-M rocket**, the same type planned for the launch in September, 2022.
- Many components of the mission’s rover are also Russian-made.
 - The components include **radioisotope heaters** that are used to keep the rover warm at night on the surface of Mars.

What about the Other Mars Missions?

- [NASA’s Perseverance Rover](#)
- [UAE’s Hope Mars Mission](#) (UAE’s first-ever interplanetary mission)
- India’s [Mars Orbiter Mission \(MOM\)](#) or Mangalyaan:
 - It was launched from the Satish Dhawan Space Centre in Andhra Pradesh by the [Indian Space Research Organisation](#) in November 2013.
 - It was launched on board a PSLV C25 rocket with the aim of studying Martian surface and mineral composition as well as scan its atmosphere for methane (an indicator of life on Mars).
- [Tianwen-1: China's Mars Mission](#)

What do we know about Mars?

- **Size and Distance:**
 - It is the **fourth planet from the Sun** and the second-smallest planet in the Solar System.
 - Mars is about **half the size of Earth**.
- **Similarity to the Earth (Orbit and Rotation):**
 - As Mars orbits the Sun, it **completes one rotation every 24.6 hours**, which is very similar to one day on Earth (23.9 hours).
 - Mars' axis of rotation is tilted 25 degrees with respect to the plane of its orbit around the Sun. This is similar to Earth, which has an axial tilt of 23.4 degrees.
 - Mars has distinct seasons like Earth, but they last longer than seasons on Earth.
 - Martian days are called sols—short for ‘solar day’.
- **Other Features:**
 - The reason Mars **looks reddish is due to oxidation or rusting of iron in the rocks**, and dust of Mars. Hence it is also called the Red Planet.
 - It has the **largest volcano in the solar system** i.e. Olympus Mons.
 - It has **two small moons, Phobos and Deimos**.

PYQ

Which of the following pairs is/are correctly matched? (2014)

	Spacecraft		Purpose
1.	Cassini-Huygens	:	Orbiting the Venus and transmitting data to the Earth
2.	Messenger	:	Mapping and investigating the Mercury
3.	Voyager 1 and 2	:	Exploring the outer solar system

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (b)

Source: IE

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