



## UAE's Hope Mars Mission

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### Why in News

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Recently, the **United Arab Emirates' (UAE's) first-ever interplanetary Hope Probe mission** has successfully **entered orbit around Mars**.

### Key Points

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- **Hope Probe Mission:**

- **About:**

- The UAE's Mars Mission called 'Hope' was announced in 2015 with the aim of creating mankind's first integrated model of the Red planet's (Mars) atmosphere.
    - 'Hope' was developed by UAE scientists in the USA and was launched in July 2020 from the Tanegashima Space Centre in Japan.

- **Specification:**

- The Mars Hope Probe **weights just 1.5 tonnes**, about the same size as an SUV. It is **expected to complete one orbit around the planet every 55 hours**.
    - The **overall life of UAE's Mars mission is around one Martian year**, which is about 687 days on Earth.

- **Scientific Instruments:** The Probe carries three scientific instruments:

- **Emirates eXploration Imager (EXI):** A high-resolution camera.
    - **Emirates Mars Ultraviolet Spectrometer (EMUS):** A far-UV imaging spectrograph.
    - **Emirates Mars InfraRed Spectrometer (EMIRS):** It will examine temperature profiles, ice, water vapor and dust in the atmosphere of Mars.

- **Expected Benefits:**

- UAE's mission will collect data on Martian climate dynamics and help scientists understand why Mars' atmosphere is decaying into space.
    - The instruments will collect different data points on the atmosphere to also gauge seasonal and daily changes.
    - Together, this will shed light on how energy and particles, like oxygen and hydrogen, move through the atmosphere of Mars.

- **Significance:**

- With the successful Mars orbit insertion, the **UAE becomes the fifth entity to reach the Red Planet, joining NASA**, the Soviet Union, the European Space Agency and India.

- Success of this mission will help UAE in building a knowledge-based economy, leading to **more investment in Science, Technology, Engineering and Mathematics (STEM)** for young Emiratis.

The probe reached Mars in the year the **UAE celebrates its 50<sup>th</sup> anniversary**.

- 'Hope' mission is not only important for UAE, but also for the whole of Arab world, as it is the **Arab world's first interplanetary mission**.

- **Other Missions to Mars:**

Apart from the UAE's 'Hope Probe', two more unmanned spacecrafts from the USA and China are set to arrive at Mars over the next several days.

- All three missions **were launched in July to take advantage of the close alignment of Earth and Mars.**
- A **combination orbiter and lander from China** is scheduled to reach Mars, which will circle Mars until the rover separates and attempts to land in order to look for signs of ancient life.
- A **rover from the USA named 'Perseverance'** is also set to reach Mars soon. It will be the **first leg in a decade-long USA-European project** to bring Mars rocks back to Earth to be examined for evidence the planet once harbored microscopic life.

- **Objectives Behind Mars Exploration:**

- Scientists and researchers around the world are pretty much curious about Mars because of the possibility that the planet was once warm enough to allow water to flow through it, which means life could have existed there too.
- Despite being starkly different in many ways, the Red Planet has several **Earth-like features**— such as clouds, polar ice caps, volcanoes, and seasonal weather patterns.

However, no human has set foot on Mars yet because the atmosphere on Mars is very thin, consisting of mostly carbon dioxide with no breathable oxygen, making it difficult for astronauts to survive there.

### **India's Mars Orbiter Mission**

- Also known as Mangalyaan, it was launched from the Satish Dhawan Space Centre in Andhra Pradesh by **Indian Space Research Organisation** (ISRO) in November 2013.
- It was launched on board a PSLV C25 rocket with aim of studying Martian surface and mineral composition as well as scan its atmosphere for methane (an indicator of life on Mars).

**Source: IE**