



KAMARAJ IAS ACADEMY
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Mars Helicopter – Ingenuity

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Why is in news? NASA re-established contact with intrepid Ingenuity Mars Helicopter after more than 2 months of radio silence

American Space Agency, NASA, on 30 June 2023, said that it has **re-established contact with the intrepid Ingenuity Mars Helicopter** after more than two months of radio silence.

Data so far indicate that the helicopter is in good condition.

Meanwhile, the loss of communications was expected, because a hill stood between Ingenuity and Perseverance, which acts as a relay between the drone and Earth. The **mini rotorcraft**, which hitched a ride to the Red Planet with the **Perseverance rover** in early 2021, has survived well beyond its initial 30-day mission.

Since then, it has been deployed dozens of times, acting as an aerial scout to assist its wheeled companion in **searching for signs of ancient microbial life from billions of years ago**, when Mars was much wetter and warmer than today.

NASA's Ingenuity Mars Helicopter has completed 51 flights since first taking to the skies above the Red Planet on **April 19, 2021**, far exceeding its originally planned technology demonstration of up to five flights.

Highlights of Ingenuity's historic and successful activities on Mars include:

The first aircraft to **achieve powered, controlled flight on another planet**, a feat that's been called a "**Wright Brothers moment**"

Completing 91.4 flying minutes, covering 7.3 miles (11.7 km), and reaching altitudes as high as 59.1 ft (18.0 m)

Successfully flying in the **extremely thin Martian atmosphere**

Previewing areas of Mars of possible interest for the Perseverance rover to explore

Paving the **way for future aerial explorers** at Mars and, potentially, other space destinations

India's mission to mars:

Mars Orbiter Mission (MOM), India's first interplanetary mission to planet Mars was launched onboard PSLV-C25 on November 05, 2013.

ISRO has become the fourth space agency to successfully send a spacecraft to Mars orbit. Though the designed mission life is 6 months, MOM completed 7 years in its orbit on Sept 24, 2021.

The objectives of this mission are primarily technological and include design, realisation and launch of a Mars Orbiter spacecraft capable of operating with sufficient autonomy during the journey phase; Mars orbit insertion / capture and in-orbit phase around Mars.

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MOM carries five scientific payloads to study the Martian surface features, morphology, mineralogy and Martian atmosphere.

Mars continues to be an object of keen interest to scientists in the context of planetary evolution and extra-terrestrial life.

Based on our understanding of Mars, which was thought to be probably a warm and wet planet earlier, is now seen to be dry with a thin atmosphere. How this evolution has taken place is still a topic of research.

Achievements:

The Mars Colour Camera, one of the scientific payloads onboard MOM, has **produced 1100+ images so far and published a Mars Atlas.**

India's ability to **successfully realize the complex mission to Mars in its first attempt, in a cost-effective** (Rupees 450 Cr) has captured the world attention and has propelled India's image as a credible space fairing nation to greater heights.

This capability could **pave the way for greater opportunities for Space Commerce** including launch services and marketing of Satellite Imageries.

Mars Orbiter Mission is a mission of national pride which has attracted the attention of students, general public, media and international science/ technical community.

Importantly, Mars Orbiter Mission has created enthusiasm among the younger generation in the country, provoked their curiosity to understand and discuss space related techniques and is maintaining the tempo throughout the mission.

Various Mars Missions:

ExoMars rover (2021) (European Space Agency)

Tianwen-1: China's Mars Mission (2021)

UAE's Hope Mars Mission (UAE's first-ever interplanetary mission) (2021)

Mars 2 and Mars 3 (1971) (Soviet Union)

NASA's Perseverance Rover