

ISRO TO PERFORM CRUCIAL MANOEUVRE ON JANUARY 6, 2024 TO BIND ADITYA-L1 INTO L1 ORBIT

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L1 is about 1.5 million km from the Earth and the distance of L1 from Earth is approximately 1% of the Earth-Sun distance. | Photo Credit: ANI

With the Aditya L1 spacecraft expected to reach the Lagrangian point (L1) on January 6 the Indian Space Research Organisation (ISRO) will attempt a crucial manoeuvre to bind the spacecraft to an orbit around L1.

Aditya-L1 the first Indian space based observatory to study the Sun was launched on September 2, 2023 from the Satish Dhawan Space Centre in Sriharikota.

Subsequently, ISRO Telemetry Tracking and Command Network (ISTRAC) in Bengaluru carried out four earth-bound manoeuvres between September 3 and September 15.

Aditya-L1 on September 19 underwent the Trans-Lagrangian1 insertion manoeuvre, marking the beginning of its 110-day trajectory to the destination around the L1 point.

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On January 6 at approximately around 4 pm ISRO Scientists and Engineers from the Mission Operations Complex of ISTRAC will perform the crucial manoeuvre which will bind Aditya-L1 to an orbit around L1.

The propulsion system of the spacecraft comprises the 440 Newton Liquid Apogee Motor (LAM) engine plus eight 22 Newton thrusters and four 10 Newton thrusters which will be intermittently fired to perform the manoeuvre.

According to ISRO a satellite placed in the halo orbit around the L1 point has the major advantage of continuously viewing the Sun without any occultation/eclipse. This will provide a greater advantage of observing the solar activities continuously.

Aditya-L1 carries seven payloads to observe the photosphere, chromosphere, and the

outermost layers of the Sun (the corona) using electromagnetic and particle detectors.

Using the special vantage point of L1, four payloads will directly view the Sun and the remaining three payloads will carry out in-situ studies of particles and fields at the L1.

Aditya-L1 has a mission life of five years during which its payloads are expected to provide the most crucial information to understand the problem of coronal heating; coronal mass ejection; pre-flare and flare activities and their characteristics; dynamics of space weather; and propagation of particles and fields.

There are currently four operational spacecraft at L1 which are WIND, Solar and Heliospheric Observatory (SOHO), Advanced Composition Explorer (ACE) and Deep Space Climate Observatory (DSCOVER).

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