

Aditya-L1 launch: ISRO pushes Aditya to a larger orbit

September 3, 2023

September 3, 2023: Sriharikota, Andhra Pradesh, India: **Indian Space Research Organisation (ISRO)** said the first Earth-bound firing to raise Aditya-L1's orbit has been successfully completed at 11:45 am on Sunday, moving it to an orbit of **245 km x 22459 km**.

Earlier on **2nd September**, the **Polar Satellite Launch Vehicle (PSLV-C57.1)** rocket carrying the orbiter had lifted off successfully from the **Satish Dhawan Space Centre (SDSC)** in **Andhra Pradesh (AP)**'s Sriharikota. Aditya-L1 satellite was put precisely into its first orbit (Please see the Figure on page #2.)

Aditya-L1 will stay in Earth-bound orbits for 16 days, during which it will undergo five manoeuvres to gain necessary velocity for its journey.



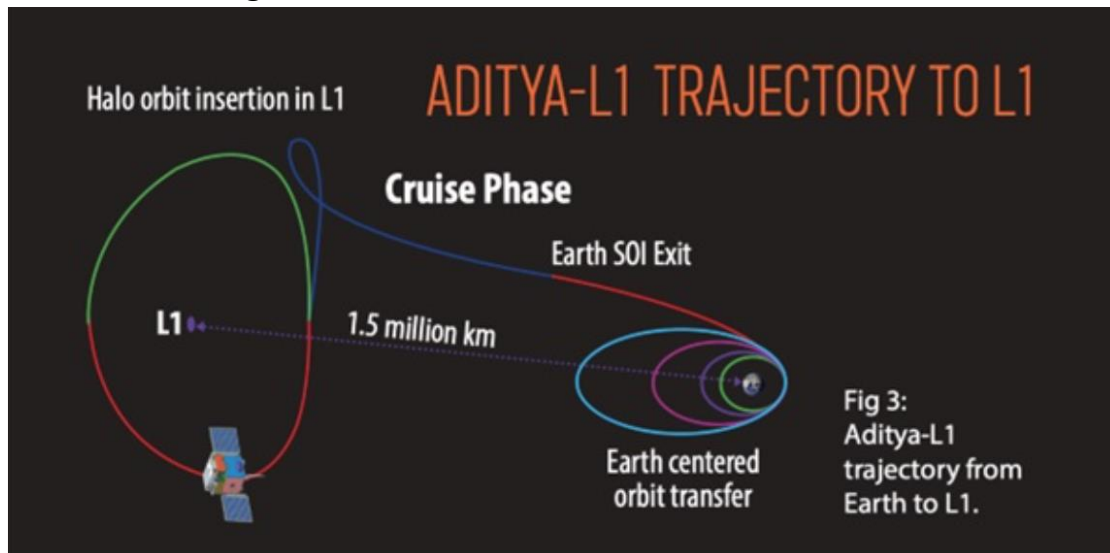
*September 2, 2023: SDSC, Sriharikota, AP, India:
Launch of India's first solar mission 'Aditya-L1'*

The successful launch of ISRO's first solar mission came a week after India's Chandrayaan-3's historic lunar landing.

Top updates on Aditya-L1 solar mission:

1. September 3, 11:45 hours: "Aditya-L1 started generating the power. The solar panels are deployed. The first Earth-Bound firing to raise the orbit to **245 km x 22459 km**.

2. The Earth-bound manoeuvres will involve firing of the rockets and some adjustments to angles, as required. It is similar to applying some force, when a person is on a swing, to make the swing go higher. This is done through application of pressure (by shifting body weight), when the swing is coming down towards the ground.



Reference: https://www.isro.gov.in/Aditya_L1-MissionDetails.html

(It shows step-by-step working. The distances are NOT according to scale.)

3. Aditya-L1 will stay in Earth-bound orbits for **16 days**, during which it will undergo five manoeuvres to gain the necessary velocity for its journey, the ISRO said.

4. Subsequently, Aditya-L1 will undergo a trans-Lagrangian1 insertion manoeuvre, marking the beginning of its **110-day** trajectory to the destination around the L1 Lagrange Point.

5. Once Aditya-L1 arrives at the L1 point, another manoeuvre will bind Aditya-L1 to an orbit around L1, a balanced gravitational location between the Earth and the Sun. **The satellite will spend its whole mission life orbiting around L1 in an irregularly shaped orbit in a plane roughly perpendicular to the line joining the Earth and the Sun.** L1 is 1.5 million km away from the Earth in the direction of the Sun.

6. MEASUREMENTS: Aditya-L1 is carrying seven different payloads, which will conduct a detailed study of the Sun. While four of the payload instruments will observe the light from the Sun, the remaining three will measure in-situ parameters of the plasma and magnetic fields.

7. This strategic location will enable Aditya-L1 to continuously observe the Sun without being hindered by eclipses or occultation, allowing scientists to study solar activities and their impact on space weather in real-time.

8. The spacecraft's data will help identify the sequence of processes that lead to solar eruptive events and contribute to a deeper understanding of space weather drivers.
By-- Dr K N Mistry

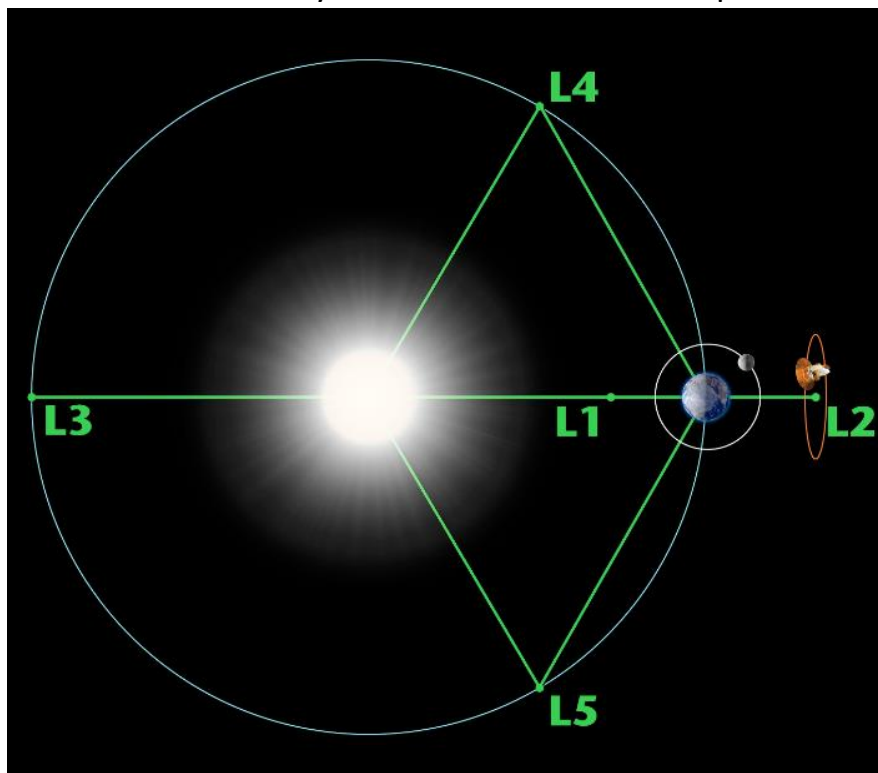
----BACKGROUND on LAGRANGE POINTS----

Lagrange Points (1772) are positions in space where the gravitational forces of a two-body system like the Sun and Earth produce enhanced regions of attraction and repulsion. These can be used by spacecraft as "parking spots" in space to remain in a fixed position with minimal fuel consumption.

There are five such points in the earth-sun system. Three of them lie on a straight line, joining the earth and the sun.

The other two lie on the vertices of two equilateral triangles, as shown in the Figure. (**Reference:** NASA: <https://tinyurl.com/42yd2fcn>)

The L1 point of the Earth-Sun system affords an uninterrupted view of the sun.



*LAGRANGE POINTS, discovered by
Italian-French mathematician Joseph-Louis Lagrange in 1772*

Note: Please read "A NASA Spacecraft catches the solar wind, ISRO to follow" of June 11, 2023 at <https://diginews360.com/a-nasa-spacecraft-catches-the-solar-wind-isro-to-follow/> . On page 3, www.DiGiNews360.com had given brief information about the forthcoming Solar Probe of ISRO.