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India gears up for launch of maiden solar mission

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NEW DELHI: Days after attempting to successfully land Chandrayaan-3 — India's third lunar mission — on the moon's surface on August 23, the Indian Space Research Organisation (ISRO) will gear up for another big-ticket launch, its maiden solar mission Aditya-L1, in the end of August or early September, senior officials aware of the matter said.

The space agency on Monday confirmed that the Aditya-L1 satellite has reached the Satish Dhawan Space Centre (SDSC) in Sriharikota for the launch.

"PSLV-C57/Aditya-L1 Mission: Aditya-L1, the first space-based Indian observatory to study the Sun, is getting ready for the launch. The satellite realised at the UR Rao Satellite Centre (URSC), Bengaluru has arrived at SDSC-SHAR, Sriharikota," ISRO said in a statement on Monday.

Aditya-L1 is India's first dedicated scientific mission to study the Sun. Earlier, this mission was conceived as Aditya-1 with a 400kg-class satellite carrying one payload, the Visible Emission Line Coronagraph (VELC), and was planned to be launched in an 800km-low Earth orbit.

However, since a satellite placed in the halo orbit around the first Lagrangian Point (L1) of the Sun-Earth system has the advantage of continuously viewing the Sun without any occulta-



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tion or eclipses, the Aditya-1 mission was in 2020 renamed the Aditya-L1 mission. It will now be inserted in a halo orbit around the L1 — 15 million km — from the Earth towards the Sun.

ISRO scientists said that the instruments on Aditya-L1 will be tuned to observe the solar atmosphere, mainly the chromosphere and corona, and will also observe the local environment at L1. There are seven payloads on-board with four of them carrying out remote sensing of the Sun and three carrying out in-situ observation.

"The spacecraft carries seven payloads to observe the photo-

sphere, chromosphere and the outermost layers of the Sun (the corona) using electromagnetic and particle and magnetic field detectors. Using the special vantage point L1, four payloads directly view the Sun, and the remaining three payloads carry out in-situ studies of particles and fields at the Lagrange point L1, thus providing important scientific studies of the propagatory effect of solar dynamics in the interplanetary medium," the mission document read.

"The suits of Aditya-L1 payloads are expected to provide 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, propagation of particle and fields," it added.

Meanwhile, ISRO on Monday conducted another lunar manoeuvre in Chandrayaan-3, reducing the altitude of the spacecraft further and taking it closer to its 100km circular orbit. ISRO said the next operation is planned for August 16, and after that the propulsion module will be separated from the lander and rover.

"Chandrayaan-3 Mission: Orbit circularisation phase commences. Precise manoeuvre performed today has achieved a near-circular orbit of 150 km x 177 km. The next operation is planned for August 16, 2023, around 0830 hrs IST," ISRO said.

Chandrayaan-3, a follow-up mission to Chandrayaan-2, aims to demonstrate end-to-end capability in safe landing and roving on the lunar surface. The spacecraft comprises a lander and rover configuration, which will be carried by a propulsion module of 100 km lunar orbit. The second lunar mission came as a disappointment for ISRO after the lander failed to make a soft landing on the moon. ISRO officials said the mission was only a "part failure" because while the lander and rover did not complete its scientific objectives, the rover continues to provide key data and pictures from the moon.