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■VOL. XCIX NO. 205■PRICE ₹6.00/WITH HINDUSTAN ₹10.50 (₹9.50 IN FARIDABAD)/WITH MINT ₹15.50■24 PAGES + 6 PAGES OF HT CITY.
AREA SPECIFIC PAGES EXTRA.

NEW DELHI/METRO
Tuesday, August 29, 2023

Hindustan Times
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Aditya-L1 solar mission set for Saturday launch

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NEW DELHI: The Indian Space Research Organisation (Isro) announced on Monday that it will launch its first spacecraft to survey the Sun on September 2 at 11.50am, days after it created history by reaching close to the south pole of the Moon from where its Chandrayaan-3 has been sending the first readings about the atmosphere and the surface.

The solar mission will be carried out by the Aditya-L1, which will be launched from the Sriharikota spaceport on the Isro's workhorse rocket, the PSLV, or polar satellite launch vehicle. After travelling 125 days to reach a distance of 1.5 million km from the Earth, it will stay put for an as yet unannounced duration of time.

"Aditya-L1 is the first space-based observatory-class Indian solar mission to study the Sun. The spacecraft is planned to be placed in a halo orbit around the Lagrangian point 1 (L1) of the Sun-Earth system, which is

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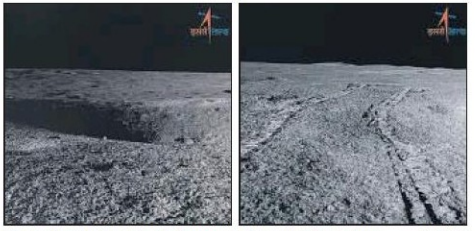

The rover Pragyan retraced its path after encountering a crater (left) on Sunday. ISRO TWITTER

Pragyan avoids crater, on track

NEW DELHI: The Pragyan rover on Sunday retraced its path to avoid a 4-metre-wide crater on the lunar surface in a delicate display of its maneuvering abilities.

The rover is not safely heading on a new path, the Indian Space Research Organisation said in a statement on Monday.

"On August 27, 2023, the Rover came across a 4-meter diameter crater positioned 3 meters ahead of its location. The Rover was commanded to retrace the path. It's now safely heading on a new path," it said.

The rover is designed to avoid obstacles in the path, a senior scientist from the Chandrayaan-3 mission team said.

"The rover relies on commands given to it for movement on the lunar surface. Through the navigation cameras, our teams monitor the rover's movement and give commands to it for movement. If there is an obstacle, such as the crater that we encountered yesterday, we retract the path," the scientist explained.

→P7

SOLAR MISSION

about 1.5 million km from the Earth," said a document released by Isro detailing the project.

"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. The spacecraft will carry seven payloads to observe," it added.

HT reported on Saturday that September 2 was the likely launch date for the mission, with a broader window set for the September 1-5 period.

The mission is ambitious for several reasons — first, is the challenge of stationing a craft at a Lagrange point, which India has not done before.

There are five Lagrange points in space where gravity of the two closest objects in the solar system interact in such a way that a spacecraft placed at any of these will remain stable there (usually in a small orbit). Aditya-L1, as its name implies, will be stationed at the L1 point, the closest of the five Lagrange points, and also one from which an unhindered view of the Sun is possible.

Second, the nature of new insights that the spacecraft can bring. It will carry seven payloads, including four to observe the Sun's outermost layers — known as the photosphere and chromosphere — by using electromagnetic and particle field detectors.

Among several objectives, it will study the drivers for space weather, including to better understand the dynamics of solar wind.

"The suit of Aditya-L1 payloads are expected to provide most crucial information to understand the problems of coronal heating, coronal mass ejection, pre-flare and flare activities, and their characteristics, dynamics of space weather, study of the propagation of particles, fields in the interplanetary medium, etc," the agency's document explained.

Studying these insights will help because the Sun affects many aspects on Earth, outside of just the sunlight. Flares, for instance, can cause radiomagnetic disturbances, and how these travel through the expanse of space too requires deeper understanding.

Speaking to news agencies on Monday, former Isro scientist Nambi Narayanan said: "This mission aimed at studying the Sun in close contact. Sun is the nearest star to Earth, and is a hot mix of helium and hydrogen about 150 million kms away from you. The findings of this mission will be significant."

The United States' agency Nasa and the European Space Agency (ESA) have previously placed orbiters to study the Sun, but India's projects — like its others — will likely be significantly cheaper.

Among the way this will be done is by using the extremely reliable PSLV, in the XL configuration of the rocket — which is a more powerful version than the type typically used for satellite launches.

"Initially, the spacecraft will be placed in a Low Earth Orbit. Subsequently, the orbit will be made more elliptical and later the spacecraft will be launched towards L1 by using on-board propulsion. As the spacecraft travels towards L1, it will exit the Earths' gravitational Sphere of Influence (SOI). After exit from SOI, the cruise phase will start and subsequently the spacecraft will be injected into a large halo orbit around L1. The total travel time from launch to L1 would take about four months for Aditya-L1," said the agency in its mission document.

Pragyan rover avoids crater, data collection key objective now: Isro

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NEW DELHI: The Pragyan rover on Sunday retraced its path to avoid a 4-metre-wide crater on the lunar surface in a delicate display of its manoeuvring abilities. The rover is now safely heading on a new path, the Indian Space Research Organisation (Isro) said in a statement on Monday.

"Chandrayaan-3 Mission: On August 27, 2023, the rover came across a 4-meter diameter crater positioned 3 meters ahead of its location. The rover was commanded to retrace the path. It's now safely heading on a new path," the statement said.

The rover is designed to avoid obstacles in the path, a senior scientist from the Chandrayaan-3 mission team said, adding that a dedicated team is monitoring its movement to steer it clear of any such obstacles.

Chandrayaan-3's Pragyan rover moves around the 'Shiv Shakti Point', the touchdown spot of the Vikram lander on Saturday. PTI

"The rover relies on commands given to it for movement on the lunar surface. Through the navigation cameras, our teams monitor the rover's movement and give commands to it for movement. If there is an obstacle, such as the crater that we encountered yesterday, we retract the path," the scientist explained.

With nine more days to go for the lunar sunset, when the mission life will end, the focus of the agency is to maximise findings from the lander, Vikram, and rover, and optimise their operations, scientists said.

All equipment in the mission is solar-powered, and the mission is scheduled to end with the next lunar sunset on September 6.

"The focus currently is on observations more than analysis. All the payloads are functional and are providing us very good data," said Anil Bhardwaj, director, Physical Research Laboratory, one of Isro's labs that is closely involved in the Chandrayaan-3 mission.

The agency is waiting for "ample lighting facing the lander" to get photos of the lander on the lunar surface clicked by cameras on board the rover, he said.

"A big factor on the lunar surface is lighting and the inclination, which ensures visibility. As soon as we get ample lighting facing the lander, we will be in a position to release those pictures," Bhardwaj said.

The mission has three objectives — to demonstrate a safe and soft landing on the moon surface, to demonstrate roving abilities on the surface of moon, and to conduct in-situ scientific experiments.

Chandrayaan-3's Vikram lander made a successful landing near the south pole of the moon on August 23.

On Friday, the Pragyan rover rolled out of the lander's belly over a two-segment ramp. On Sunday, agency released temperature variation data observed on the lunar surface by the lander module.

Over the next nine days, the lander and the rover will conduct a series of experiments on the lunar surface, where it will analyse the chemical and mineral composition of materials — dust and rock — on the surface.

{ DEMOLITION NEAR KRISHNA JANMABHOOMI }

SC asks petitioner to approach civil court

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NEW DELHI: The Supreme Court on Monday disposed of a plea related to the demolition drive to clear alleged illegal constructions near Krishna Janmabhoomi in Mathura in Uttar Pradesh, and granted liberty to the petitioner to seek relief before the civil court.

Closing the petition filed by Yakub Shah, seeking possession of land and protection from eviction till a civil suit filed by residents is decided by a Mathura civil court, a bench headed by justice Aniruddha Bose said, "... You are seeking ownership by adverse possession. You have to prove it before the civil court."

The bench, also comprising justices Sanjay Kumar and SVN Bhatti, asked the petitioner's counsel what relief can be given in a petition filed under Article 32 of the Constitution when suits are pending before the civil court. Article 32 empowers citizens to approach the apex court directly for enforcement of their fundamental rights.

The petitioner's counsel argued that the authorities conducted the demolition exercise on a day when the courts in UP were closed and 100 houses were already demolished. "You have full remedy before the suit court," the bench said, adding it cannot run parallel proceedings.

World is praising Isro after success of Chandrayaan-3: Shah in Gujarat

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AHMEDABAD: After the success of India's Chandrayaan-3 mission, the whole world is praising the Indian Space Research Organisation, Union home minister Amit Shah said on Monday, adding that Prime Minister Narendra Modi has set the country on a trajectory to become a global leader in space by 2030.

"In the last nine years, with his foresight, Prime Minister Narendra Modi has not only given a new direction to India's space sector but has made a time-bound programme and framework to take India to the forefront of the world in the field of space by the year 2030," said Shah, chairing the 26th Western Zonal Council meeting in Gandhinagar. The meeting was attended by the chief ministers of Gujarat, Maharashtra and Goa and the administrator of Dadra & Nagar Haveli and Daman & Diu, deputy chief minister of Maharashtra and other ministers, chief secretaries from the states in the western zone.

Amit Shah

During the meeting, the Union minister hailed the Centre's proposal to introduce three new draft legislations — the Bhartiya Nyaya Sanhita Bill, 2023, Bharatiya Nagarik Suraksha Sanhita Bill, 2023, and Bharatiya Sakshya Bill, 2023 — to replace the colonial-era Indian Penal Code, Code of Criminal Procedure and Evidence Act.

"After the passage of the three new bills... no case can continue for more than two years, which will result in elimination of 70% negative energy," he said.

Some of the crucial issues discussed at the meeting included those related to transfer of land, water supply, operationalisation of auctioned mines, cash deposit facility at Common Service Centre, coverage of villages by bank branches/postal banking facilities and speedy investigation of cases of sexual offence/rape against women and children, people familiar with the matter said.