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Vikram sends back first moon readings

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NEW DELHI: Chandrayaan-3's Vikram lander module has recorded temperatures at various layers of the lunar surface, the Indian Space Research Organisation (Isro) said on Sunday, in the first such experiment that is set to offer new insights into Moon's thermal behaviour and characteristics of lunar soil, especially close to its south pole.

The temperature graphs, released by the space agency on Sunday, revealed that the temperature dropped significantly as the probe dug deeper into the lunar surface, which, while not unexpected, is the first time it has been quantified minutely.

"Chandrayaan-3 Mission: Here are the first observations from the ChaSTE payload on-board Vikram Lander. ChaSTE (Chandra's Surface Thermophysical Experiment) measures the temperature profile of the lunar topsoil around the pole, to understand the thermal behaviour of the moon's surface," Isro said in a statement on Sunday.

The ChaSTE payload, one of the four on board Vikram, was designed to measure how the lunar surface absorbs heat, which it did so by measuring the temperature a little above the surface, and then at various intervals as the probe dug up till about 8cm into the ground.

"ChaSTE has a temperature probe equipped with a con-

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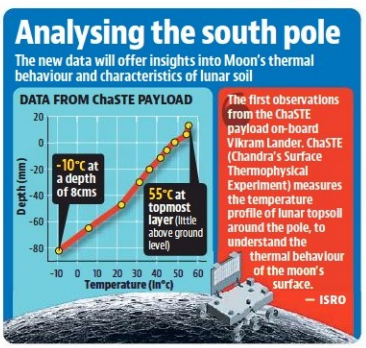

MOON LANDING SYMBOL, SPIRIT OF NEW INDIA: MODI

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NEW DELHI: The Chandrayaan-3 mission has become a "symbol and spirit of a New India" which wants to emerge victorious, Prime Minister Narendra Modi said on Sunday. Addressing the 104th edition of his monthly radio broadcast Mann ki Baat, Modi said that the mission is a "classic illustration of women power" as several women scientists were directly linked to it.

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INDIA CAPABLE OF MISSIONS TO MARS, VENUS: ISRO CHIEF

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NEW DELHI: India has the capability of travelling to the Moon, Mars and Venus, but the sector needs more investment, the Indian Space Research Oganisation chief S Somanath said on Sunday, days after Chandrayaan-3's lander made a successful soft landing near the lunar south pole on August 23.

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MOON READINGS

trolled penetration mechanism capable of reaching a depth of 10 cm beneath the surface. The probe is fitted with 10 individual temperature sensors," Isro said.

According to the findings relayed to Isro by Vikram, a temperature of around 55°C was recorded at the topmost level of the reading, which was a little above the ground level. At a depth of about 8cm, the temperature fell to around -10° Celsius, the data showed.

"The presented graph illustrates the temperature variations of the lunar surface/near-surface at various depths, as recorded during the probe's penetration. This is the first such profile for the lunar south pole. Detailed observations are underway," the agency said.

The payload was designed by scientists at Isro's Space Physics Laboratory in the Vikram Sarabhai Space Centre and the Physical Research Laboratory.

Apart from measuring heat flows on the lunar surface, and the temperature of the regolith (loose soil and rock debris that blankets the bedrock), ChaSTE will also provide data on the characteristics of lunar soil.

Isro activated the payload on August 24, a day after the lander made a successful soft landing near the south pole of the Moon, making India the first country in the world to achieve the feat.

The experiments are scheduled to go on for 10 more days, till the lunar sunset, Isro chief S Somanath said.

"We have around 10 more days of experiments to go and during the course we will be receiving some very critical data. The lander and the rover are also sending a lot of pictures from the lunar surface, some unique ones that have never been taken so far. Our data network teams are processing those," Somanath said.

Apart from ChaSTE, the lander is carrying the Instrument for Lunar Seismic Activity (ILSA) for measuring the seismicity around the landing site and the Langmuir Probe (LP) to estimate the plasma density and its variations. A passive Laser Retroreflector Array from the National Aeronautics and Space Administration (NASA) has also been accommodated for lunar laser ranging studies.

The rover, on the other hand, has the payload of the Alpha Particle X-ray Spectrometer (APXS) and Laser Induced Breakdown Spectroscope (LIBS) for deriving the elemental composition in the vicinity of landing site.

India capable of launching more planetary missions: Somanath

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NEW DELHI: India has the capability of travelling to planets such as Mars and Venus, but the sector needs more investment, the Indian Space Research Oganisation (Isro) chief S Somanath said on Sunday, days after Chandrayaan-3's lander made a successful soft landing near the lunar south pole on August 23.

The space agency will dedicatedly work towards fulfilling the vision that Prime Minister Narendra Modi put forth in his interaction with scientists on Saturday, he added.

"India has the capability to travel to the Moon, Mars and Venus but we need to increase our confidence. We need more investment, and the space sector must develop and by this, the whole nation should develop, that is our mission. We are ready to fulfil the vision that was given to us by PM Modi," Somanath said in an interaction with mediapersons in Thiruvananthapuram.

On Saturday, the PM met scientists at the Bengaluru command centre of Isro, and congratulated them on the success of the Chandrayaan-3 mission. During his address, the Prime Minister also named the landing spot of the Vikram module Shiv Shakti, while the spot where Chandrayaan-2 crash landed in 2019 will be known as Tiranga point.

Modi announced that August 23 will be celebrated as National Space Day to mark Chandrayaan-3's landing on the Moon.

On the choice of the name, the Isro chief said that Shiv Shakti symbolises the synergy between men and women, who have contributed to the success of the mission.

"The explanation that the honourable Prime Minister gave on 'Shiv Shakti', he represented it as a combination of man and woman, the contribution of women in Isro and the need to create that kind of synergy in the organisation. So, he narrated the meaning of the word in a manner that suits all of us. There is nothing wrong with that. He also gave the next name to 'Tiranga' (the spot where Chandrayaan-2 crash landed in 2019). Both are Indian-sounding names. He has a prerogative of naming it being the prime minister of the country," Somanath said.

He further said that both the rover and the lander of the Chandrayaan-3 have taken pictures on landing.

The chairman said the Isro team was waiting for more high-quality images in the coming days and, as of now, they were concentrating more on scientific studies and research about Moon.

Isro has already started work on its missions for Mars and Venus. Shukrayaan-1, a tentative name for its Venus mission, is expected to launch sometime around 2025 with an objective to study the atmosphere of Venus.

Similarly, the Mars Orbiter Mission-2, India's second Mars mission, is also expected around 2024 or 2025, Isro officials said.

Separately, the agency is preparing for the launch of Aditya L1 in the first week of September. "Aditya L1 satellite is ready. It has reached Sriharikota and is connected to PSLV. The next aim of ISRO and the country is its launch. The launch will be in the first week of September," Somanath said, adding that the final date will be announced in two days.

"After the launch, it will go to an elliptical orbit and from that it will travel to the L1 point which will almost take 120 days," he added. Aditya-L1 will be the first space-based Indian observatory to study the Sun.

Aditya-L1, named after the Sun's core, aims to provide unprecedented insights into the Sun's behaviour by placing itself in a halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system, approximately 1.5 million kilometres from Earth.

Isro chief S Somanath with his team after successful soft-landing of Chandrayaan-3 lander on the surface of Moon on August 23. ANI

'A symbol and spirit of new India': Modi hails Chandrayaan-3

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NEW DELHI: The Chandrayaan-3 mission, the country's third lunar project that was successfully launched by the Indian Space Research Organisation (Isro) recently, has become a "symbol and spirit of a New India", which wants to emerge victorious under any circumstances, Prime Minister Narendra Modi said on Sunday.

Modi also said that the mission is a "classic illustration of women power" as several women scientists and engineers were directly linked to it, and that India's daughters are not only shattering glass ceilings but also challenging Space, which is considered "infinite".

The Prime Minister was addressing the 104th edition of his monthly radio broadcast, "Mann ki Baat", when he made the remarks.

"On August 23, our Chandrayaan-3 mission proved to the world that the dawn of revolution and resolve can also light up the dark side of the moon. Mission Chandrayaan has become a symbol and the spirit of a new India. This is an India, which wants to emerge victorious at all costs," he said.

"The success of Chandrayaan-3 has seen the entire country immerse itself in unbridled celebrations. It has been more than three days since our lunar lander, 'Vikram', touched down on the moon's surface. Such is the enormity of the mission's success that any discussion on it seems futile," he added.

Narendra Modi

On August 23, India scripted history as Isro's ambitious third Moon mission Chandrayaan-3's Lander Module touched down on the lunar surface, making it only the fourth country to accomplish the feat, and first to reach the uncharted south pole of Earth's only natural satellite.

Modi said the mission will be a "source of inspiration for every effort that goes into taking this country forward in the coming days". "It will remind us that failure isn't the end of the world," he said, referring to the Chandrayaan-2 mission's unsuccessful bid to soft land on the Moon.

Speaking on the role of the women scientists, Modi said: "India's Chandrayaan-3 mission is a classic illustration of our women power...They handled vital responsibilities such as those of a project director and project manager."

Referring to his Independence Day speech, the PM said: "I told in Red Fort that women-led development should be established as a characteristic of the nation and Chandrayaan too is a prime example of that."

(With agency inputs)