Chandrayaan-2
Eyes on the Lunar South Pole

SOMETIMES the unexpected happens. India’s highly commendable space programme and extremely successful space launches always inspire confidence. And so it is that the flavour of this editorial had to be changed at the last moment when it became known in the early hours of 15 July that the much expected launch of Chandrayaan-2 had been put off.

India’s most ambitious space mission till date is being seen as a stepping stone for the country’s next mega space programme – the manned mission in 2022. The Chandrayaan-2 programme envisaged a soft landing of its lander Vikram – a feat that would propel the country into an elite club of three other countries – the US, Russia and China – who have successfully soft-landed a lander on the moon’s surface.

The Chandrayaan-1 mission in 2008 had confirmed the presence of water on the moon. Chandrayaan-2, to be launched on-board India’s most powerful indigenously designed rocket – GSLV Mk-III – is slated to study the lunar South Pole that remains in shadow and is much larger than the North Pole. Apart from the possibility of the presence of water, the South Pole region has craters that are cold traps containing a fossil record of the early Solar System. Studying them could give us a better understanding of the origin and evolution of the Moon.

When it finally takes off, perhaps later this month, Chandrayaan-2’s orbiter is supposed to orbit the Moon at an altitude of 100 km. Its Orbiter High Resolution Camera (OHRC) will conduct high-resolution observations of the landing site before the lander separates from the orbiter.

The six-wheeled, AI-powered robotic rover functioning on solar energy will communicate with the lander Vikram, which is named after Dr Vikram Sarabhai, the Father of the Indian space programme, and is designed to land softly on the lunar surface. It has the capability to communicate with IDSN at Byalalu near Bangalore, as well as with the Orbiter and Rover. The IDSN or Indian Deep Space Network is a network of large antennas and communication facilities operated by the Indian Space Research Organisation to support the interplanetary spacecraft missions of India.

The science payloads of Chandrayaan-2 will study among other things topography, seismography, mineral identification and distribution, surface chemical composition, thermo-physical characteristics of top soil and composition of the lunar atmosphere.

The night-long vigil on 15th July had an anti-climax when ISRO officials called off the launch an hour before the scheduled launch. The officials informed that the problem was with the critical cryogenic stage. However, unfazed and displaying “abundant precaution”, ISRO officials ensured that the rocket and satellite were safe. With the world space community watching India’s foray to the Moon with interest, and with $120 million invested in the project, ISRO officials have avoided undue haste and displayed professionalism. And they are quite optimistic that Chandrayaan-2 will fly into space later in the month.

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