



INNOVATION IN SPACE EXPLORATION - PRIVATE PLAYERS ON THE MOON



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Missions to the moon have been the most challenging space exploration endeavours ever to be undertaken by mankind. Manned missions to the moon have been even more challenging due to the many intricacies involved. So far, the US has been the only country to successfully undertake a manned moon landing on July 16, 1969 in the Apollo 11 mission. While the erstwhile USSR was also attempting the same feat simultaneously, they could only achieve a manned moon orbiter mission. China was the latest entrant in landing a rover on the moon in 2013 and the third country to orbit a man around the moon. India's Chandrayaan-1 launched in 2008 was also successful as a moon orbiter, joining the select group of nations having orbited the moon along with USA, Russia, China, Japan and EU.

Moon being the nearest celestial object to the Earth with adequate resources to be exploited has still not been fully explored even after almost half a century since the first moon landing. Yet, NASA had suspended the moon missions after the last Apollo mission on December 11, 1972. The reasons cited were many, like an economic slowdown due to oil crisis in 1973, the Vietnam war and cold war being at its peak, all of which changed the budgetary priorities for USA. Having wound down a functional moon exploration programme, the US found it difficult to get back to the moon with other space programmes taking precedence.

Exploration missions to the Moon, Mars, interplanetary space and deep space are still considered as 'work in progress' with the established space powers making some headway. India has also contributed with the Mangalyan mission to Mars launched in November, 2013. Interplanetary and deep space exploration needs resources and budget allocations and is time consuming. Diversification of efforts is the need of the hour and countries other than the US have to take the lead

as space exploration benefits entire mankind. The Moon being our nearest neighbour in space, is our gateway to the rest of the universe. Making it to the Moon is an essential stepping-stone. China and India have been partially successful in this objective and have to take it further, step by step. China's Chang'e-4 mission, scheduled to launch in 2018, is designed to soft-land on the far side of the Moon and deliver a surface rover (probably a copy of the rover that landed on the near side during the Chang'e-3 mission in 2013)¹. India's Chandrayaan-2, scheduled for launch in March 2018, will be an advanced version of the previous Chandrayaan-1 mission and will be equipped with an Orbiter Craft module and a Lander Craft module carrying a Rover developed by Indian Space Research Organisation (ISRO) ².

But, can any developing country afford independent space exploration missions when space exploitation and research is still at its nascent stages for many countries. Even the developed countries and leading space powers need dedicated resources and funding for such projects. Space and moon exploration may be important issues for development of mankind, but need to be progressed in a graded manner with greater participation of the scientific community and entrepreneurs as private ventures with the whole hearted support of the Government. This serves the dual purpose of achieving scientific goals in space exploration without committing the existing space infrastructure and resources alongside pursuing the primary goals of a nation's space policy.

A unique opportunity has been offered by Google Lunar XPRIZE. The \$30M Google Lunar XPRIZE is an unprecedented competition to challenge and inspire engineers, entrepreneurs and innovators from around the world to develop low-cost methods of robotic space exploration. To win the Google Lunar XPRIZE, a privately funded team must be the first to land its spacecraft on the surface of the Moon, move its craft a distance of at least five hundred metres and transmit High Definition images and videos back to the earth. Five teams, SpaceIL (Israel), Moon Express (US), Synergy Moon (Multinational), TeamIndus (India), and HAKUTO (Japan), have each secured a contract to launch their spacecraft.³

TeamIndus, India's first private space startup is the official Indian competitor and it has signed a commercial launch contract with ISRO for launching the spacecraft on a Polar Satellite Launch Vehicle. The launch is tentatively planned for December 28, 2017. The mission appears quite similar to that of Chandrayaan-2 and gives an opportunity for ISRO to implement critical lessons from the experience of Team Indus.

This competition should not only be seen as a way to kick-start Indian private industry into space exploration, but also as a first step towards exploiting all the domains of space, like satellites, scientific research, tourism, alternative habitats, defence applications, mineral exploitation and so on, which probably requires a more diverse resource and talent pool than what ISRO alone can manage.

Note:- International 'Observe the Moon Night' is on October 28, 2017 and World Space Week was celebrated from October 04-10, 2017, across the world.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

Keywords: Private players in space, TeamIndus, Google Lunar XPRIZE, Moon Mission

Notes

¹ Paul D. Spudis, "China's Moon Missions Are Anything But Pointless", Airspacemag.com January 3, 2017, at www.airspacemag.com/daily-planet/chinas-moon-missions-are-anything-pointless-180961633/, accessed on October,25, 2017.

² Space Science & Exploration, at <https://www.isro.gov.in/spacecraft/space-science-exploration>, accessed on October 25,2017.

³ At <https://lunar.xprize.org/>, accessed on October 26, 2017.