

INDIA BEGINS ITS JOURNEY ON LUNAR DUST

Moon is the new limit for startups after Isro's win

Firms expect foreign collaborations, tech tie-ups after mission's success

SHINE JACOB
Bengaluru, 23 August

Moon is the new limit for startups. From supporting the country's lunar mission to setting up global technology partnerships, the Indian space startup ecosystem has set ambitious goals after the success of Chandrayaan-3. Space startups Skyroot Aerospace, Pixxel and AgniKul Cosmos and investors like growX Ventures are betting on the ecosystem, aiming to achieve new heights with their innovations.

Space Kidz India (SKI), a Chennai-based satellite design and launch company, is working on a project called Space Rickshaw to carry payloads to the Moon. The company in February launched AzaadiSAT-2.0, a satellite developed by 750 girl students living in rural India. "Our Moon mission will also be having participation from girl students," said Srimathy Kesan, SKI's founder and chief executive officer (CEO).

India has some 146 space startups: compared to 21 in 2020, according to data shared by INSPACE, an autonomous body acting as a bridge between the private sector and Indian Space Research Organisation (Isro).

Industry experts say that the cost-effectiveness of India's Moon mission will attract global majors to the country.

"This will bring in a lot of investments into the Indian space sector. A lot of interest will come for collaborations and partnerships with Indian companies. A robust lunar economy is expected to develop in India in the next 20 years," said Pawan Kumar Chandana, co-founder of Skyroot Aerospace, a startup that developed



Vikram-S, India's first privately developed rocket launched early this year.

Startups hope to benefit from an Isro initiative that has made technologies like Small Satellite Launch Vehicle (SSLV) available to the private sector. The technology transfer may boost foreign tie-ups in the space sector, they said.

"This (Chandrayaan-3) mission's triumph will be a testament to our capabili-

“THE CHANDRAYAAN-3 MISSION WILL BRING A LOT OF INVESTMENTS IN THE INDIAN SPACE SECTOR ... A ROBUST LUNAR ECONOMY WILL DEVELOP IN INDIA IN THE NEXT 20 YEARS”

Pawan Kumar Chandana
Co-founder, Skyroot Aerospace

ties in space exploration and further act as a catalyst for a dynamic ecosystem of startups dedicated to the pursuit of pioneering solutions in space technology, ranging from advanced propulsion systems to satellite constellations and more," said Awais Ahmed, founder and CEO of Bengaluru-based Pixxel.

After the sector was opened up to private companies in June 2020, it got funding of \$258 million.

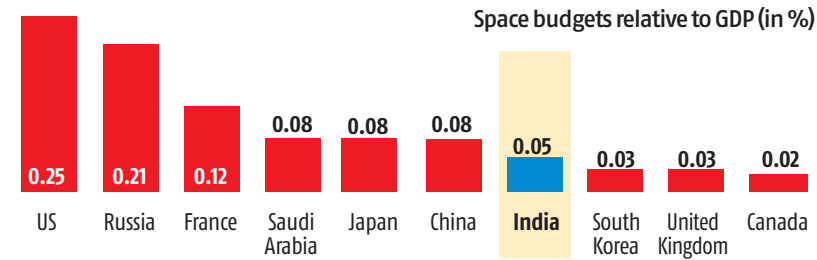
"Chandrayaan 3's success is indeed momentous, but it's also a confirmation of what we've long believed. As early as 2019, we invested in India's SpaceTech via our first fund, growX Ventures. In the startup realm, foresight and speed are essential," said Sheetal Bahl, partner at growX Ventures and Merak Ventures, a venture capital firm that has invested in Pixxel and Bellatrix.

Agnikul, Skyroot, Dhruva, and Pixxel are among space companies that have received foreign investment.

"Chandrayaan-3's success will greatly aid space startups, pushing space tech boundaries to become better and affordable," said Suyash Singh, co-founder and CEO of GalaxEye.

Space spend: India ahead of most G20 peers

INDIA'S SPENDING ON SPACE PROGRAMMES...



Note: Shows government spending relative to gross domestic product (GDP), data for 2020. Source: OECD calculations based on government budget sources and OECD databases

India spent more on its space program compared to its economic size, than many developed peers in the Group of 20 (G20) nations.

India's spending was the equivalent of 0.049 per cent of its gross domestic product (GDP), according to data compiled by the Paris-based Organisation for Economic Co-operation and Development in 2020. This is higher than the UK (0.03 per cent), Canada (0.018 per cent), and Australia (0.004 per cent). India's spending was higher than at least

ten of its peers in the G20 (chart 1).

Chandrayaan-3's successful soft landing on the lunar south pole on Wednesday has ensured India's place in the elite group of nations to have achieved this feat.

India has also launched more spacecraft than the European Space Agency, and developed nations like France. It has launched 103 spacecraft. Japan is ahead with 205. The UK has 448, China is 517 while the US leads with over 4,000 launches (chart 2).

India's space department had a budget

INDIAN SPACECRAFT OUTNUMBER FRANCE, ESA

Total number of spacecraft

| | |
|--------|-------|
| USA | 4,144 |
| CIS* | 1551 |
| China | 517 |
| UK | 448 |
| Japan | 205 |
| India | 103 |
| ESA** | 96 |
| France | 80 |
| Other | 1,027 |

*Commonwealth of Independent States; **European Space Agency; Note: Data as of 4 February 2022. Numbers includes active and defunct spacecrafts. An additional 1027 spacecraft belong to other countries. Source: NASA

allocation of ₹12,543.91 crore in 2023-24. The allocation had touched ₹13,700 crore in the previous year, though revised estimates suggest that the expenditure for the year was ₹10,530.04 crore. The 2019-20 budget figure was similar to the latest year, at ₹12,473.26 crore.

SAMREEN WANI

“

REACTION ORBIT

IT IS TRULY A MOMENTOUS OCCASION - A KIND OF EVENT THAT HAPPENS ONCE IN A LIFETIME

A LUNAR FLASHBACK

EARTH TO MOON

- July 14, 2023** Chandrayaan-3 successfully launched into orbit
- July 15** The first orbit-raising maneuver was successfully performed
- August 1** Lunar injection, the orbit achieved was 288 km x 369328 km
- August 5:** Chandrayaan was successfully inserted into the Lunar orbit
- August 17:** Lander module was successfully separated from the propulsion module
- August 23:** Chandrayaan-3 creates history by successfully soft landing on the Moon surface