भारत गणराज्य

A REVIEW OF INDIA'S SPACE AFFAIRS & OPPORTUNITIES

LUCIAN SPACE

OCTOBER 2026



A TIMELINE OF INDIA'S SPACE ACTIVITIES.

106
LAUNCH MISSIONS BY ISRO SINCE 1979

434
FOREIGN SATELLITES LAUNCHED FOR 34 COUNTRIES

4TH
NATION TO SOFT-LAND ON THE MOON, 2023

$1.4B
DEPARTMENT OF SPACE BUDGET 2026-27: RS 13,706 CRORE

400+
SPACE STARTUPS, UP FROM ONE IN 2014

1963
India launches its first sounding rocket from Thumba, Kerala.

The rocket was imported. India chose Thumba because it lies near the magnetic equator.

1975
Aryabhata, India's first satellite, reaches orbit.

ISRO built it in India. A Soviet rocket launched it. It weighed 360 kg.

1980
ISRO's SLV-3 rocket puts the Rohini satellite in orbit.

The first time an Indian rocket launched an Indian satellite, from Sriharikota.

2008
Chandrayaan-1 enters orbit around the Moon.

A NASA instrument on board finds water on the Moon's surface in 2009.

2014
The Mars Orbiter Mission reaches Mars orbit on its first attempt.

India is the first Asian nation at Mars. The mission cost Rs 450 crore.

2023
Chandrayaan-3 lands near the Moon's south pole.

India is the fourth nation to soft-land on the Moon. No landing had been so far south.

2025
Two ISRO satellites dock in orbit. Shukla flies to the ISS.

India is the fourth country to dock two spacecraft. Shukla is the first Indian on the station.

2026
Skyroot's Vikram-1 reaches orbit from Sriharikota.

India's first orbital launch by a private company, on 18 July.

ISRO · DEPARTMENT OF SPACE · NASA · AXIOM · 2026

THE INDO-PACIFIC SPACE ECOSYSTEM



CHINA	China made 92 orbital launches in 2025, and its space station, Tiangong, has been crewed without a break since 2022. In 2024 its Chang'e-6 probe brought back the first samples from the far side of the Moon. A crewed landing is planned by 2030, although the next Moon probe, Chang'e-7, was postponed in August 2026 and will not fly this year.	**92** LAUNCHES IN 2025
JAPAN	Japan's SLIM lander touched down on the Moon in January 2024 with a navigation accuracy of about 10 metres, and two Hayabusa probes have already brought asteroid samples home. The H3 rocket failed in December 2025 but flew again in June 2026. Japan will now supply the rocket and the rover for Chandrayaan-5, a joint Moon lander with India, no earlier than 2028.	**1 TRILLION YEN** SPACE STRATEGY FUND
SOUTH KOREA	South Korea created its space agency, KASA, in May 2024. Its own rocket, Nuri, put 13 satellites in orbit in November 2025 and 14 more on 7 October 2026, with Hanwha Aerospace, a private company, at most of the launch consoles under state supervision. Danuri, the national lunar orbiter, reached the Moon in 2022, and a robotic landing is planned for 2030.	**1 TRILLION WON** 2026 SPACE BUDGET
AUSTRALIA	Australia has had a space agency since 2018. Eris, the first orbital rocket built in Australia, flew for 14 seconds in July 2025, with a second flight now targeted for early 2027. In July 2026 an Australian company set up a temporary tracking station on the Cocos Islands to keep ISRO in radio contact with Gaganyaan, India's crewed spacecraft, as it crosses the Indian Ocean.	**14 SECONDS** FIRST ORBITAL ATTEMPT
SINGAPORE	Singapore created a national space agency on 1 April 2026, by which time it already had 70 space companies, 2,000 professionals and more than 30 satellites launched over two decades. The government has put S$200 million into space research since 2022, and two Singaporean radar satellites, TeLEOS-2 and DS-SAR, flew on Indian PSLV rockets in 2023.	**70** SPACE COMPANIES
PAKISTAN	Pakistan's agency, SUPARCO, dates from 1961 and works with China: Chinese rockets have launched five Pakistani satellites since January 2025, Chang'e-6 carried a Pakistani satellite to lunar orbit in 2024, and a Pakistani rover is booked on Chang'e-8, a Chinese Moon lander planned for 2028. A Pakistani astronaut is due at Tiangong on Shenzhou-24 late in 2026.	**LATE 2026** FIRST ASTRONAUT, PLANNED

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COMPARISON

	NATION	AGENCY & LAW	SATELLITES	HUMANS FLOWN	BEYOND EARTH	COMMERCIAL LAUNCH	LAUNCH FROM SOIL	VERDICT
1	CHINA	●	●	●	●	●	●	The superpower
2	JAPAN	●	●	◐	●	◑	●	The precision engineer
3	INDIA	◐	●	◐	●	●	●	The full stack
4	SOUTH KOREA	●	●	◑	◑	◐	◐	The fast follower
5	AUSTRALIA	●	◐	◑	◑	◑	◑	The ground station
6	PAKISTAN	◐	◑	○	◑	○	○	Flies with China

● ESTABLISHED ◑ OPERATIONAL ◑ NASCENT ○ NONE

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THE GLOBAL SPACE ECOSYSTEM



US | SPACEX	SpaceX did roughly half of all global orbital launches in 2025, and booster reuse is now routine. SPCX IPO'd reaching $2.1T market cap on close. This was the largest IPO in history.	**$2.1T** DAY-ONE MARKET CAP
US | NASA	FY2026 discretionary funding of $24.4B; Artemis II flew 4 astronauts around the Moon in April 2026. NASA's current plan has Artemis III rehearse docking in 2027 and a landing attempt on Artemis IV in 2028.	**$24.4B** FY2026 BUDGET
US | OTHER	Blue Origin took its first outside capital in July 2026 at $130B; Rocket Lab, Vast, Firefly and Sierra sit inside a New Space ecosystem of 950+ US space companies - more than any other country.	**$37B+** RAISED BY US SPACE FIRMS
CHINA	92 orbital launch attempts in 2025; Tiangong is permanently crewed; Chang'e-6 returned far-side samples in 2024; a crewed landing is targeted before 2030.	**92** LAUNCHES IN 2025
RUSSIA	Soyuz still ferries crews and cargo as it has for nearly six decades, but 17 launches in 2025, the loss of Luna-25 and a thin commercial sector point to a programme in retreat.	**17** LAUNCHES IN 2025
UAE	Reached Mars orbit on its first attempt in 2021, has flown two astronauts, and launched the pan-Arab 813 satellite in December 2025. Rashid 2 and an asteroid mission are slated for 2027 and 2028.	**~AED 44B** INVESTED
EUROPE	Ariane 6 has returned Europe to the launch market, and JUICE and BepiColombo continue deep-space science - but Europe still buys crew seats abroad.	**NO CREW SHIP** OF ITS OWN
JAPAN	SLIM achieved a precise lunar landing in 2024 and Hayabusa brought asteroid samples home; H3 is operational, but cadence stays deliberately low.	**1** LUNAR LANDING
UK	Home to SSTL, Eutelsat OneWeb's London operations and a deep space-finance ecosystem - but after Virgin Orbit's failure at Cornwall, Britain still awaits its first successful orbital launch from home soil.	**NO ORBITAL LAUNCH** FROM SOIL

JONATHAN'S SPACE REPORT · TRACXN · NATIONAL AGENCIES · 2026

THE CASE FOR SPACE



1 MASSIVE INFRASTRUCTURE BUILD-OUT

Space creates vast amounts of job opportunities on Earth, because the infrastructure required to support space is massive.

2 UNIQUE R&D OF VALUE TO EARTH

Some types of R&D can only be done in the zero-gravity conditions of space, but they have immense value to applications and uses back on Earth.

3 BUILD A LOCAL STARTUP ECOSYSTEM

Space draws in vast amounts of private and public money, which can support an entirely new startup ecosystem from scratch.

4 THE HOME MARKET

India already uses satellites for crop insurance, flood alerts, 200 education channels and storm warnings to fishing boats. Every new satellite has customers waiting at home.

5 THE VALUE ENGINEER

India reached Mars orbit for Rs 450 crore and landed on the Moon for about Rs 615 crore. Frugal but elite engineering is India's clear advantage.

6 SOFT POWER

A functional and efficient space programme is a display of a nation's might.

7 RESOURCES AND GAME THEORY

Other countries are going to space whether you like it or not. You can either wait and watch and be left behind when they inevitably start extracting mineral resources from space. Or you can go now.

8 THE NEW FRONTIER

Space is an open canvas waiting to be developed, like America was in the golden age of discovery.

And then look what happened to America.

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HOW HAVE SPACE TECHNOLOGIES TRANSFORMED EARTH?

DELIVERED

MAPS	**Real-time maps in your pocket.** Live routes help you navigate faster, cut fuel use and delays.	**6.5B+** DEVICES IN USE
TRANSPORT	**Planes and boats permanently run on satellites.** Fuel-optimal ocean and aircraft routes, with always-on tracking where radar could not reach. Every large vessel is tracked from orbit.	**EVERY** LARGE SHIP TRACKED
APPS	**Uber, Ola, DoorDash and Swiggy could not exist without satellites in Space.** The on-demand economy connects customers to moving drivers. Impossible without space.	**1978** FIRST GPS SATELLITE
WEATHER	**Accurate 5-day forecasts, where the 1970s only had 1-day forecasts.** Hurricane/cyclone deaths have fallen, despite coastal populations growing. Airlines, farmers and energy traders totally rely on this data.	**5 DAYS** VS 1 DAY IN 1975
DISASTERS	**Floods, wildfires and damage maps while they happen.** Drought early warning gives governments months, not weeks, to protect food supply. These save lives.	**HOURS** TO A DAMAGE MAP
CLIMATE	**Satellites tracked the ozone hole and made the Montreal Protocol enforceable.** Sea level, ice mass, forest loss and methane leaks can ONLY be measured from orbit.	**1987** MONTREAL PROTOCOL
OSINT	**Journalists, NGOs and analysts can verify events anywhere on Earth.** Arms-control treaties became verifiable.	**30CM** COMMERCIAL RESOLUTION
HEALTH	**The camera in every smartphone came from a NASA sensor.** Medical imaging, infrared thermometers, insulin pumps and water purification all came from space technologies.	**CMOS** SENSOR · NASA 1990S

NEXT

1 **LAUNCH EFFICIENCY**

Reusable rockets make orbit 10-100× cheaper. Cheaper access multiplies everything on the left dramatically.

2 **ONLY-IN-SPACE MANUFACTURING**

Optical fibre, semiconductor crystals, purer drug crystals and 3D-printed vascularised tissue: these are materials that CANNOT form under gravity.

3 **BIOMEDICAL R&D**

Microgravity accelerates critical research on ageing, bone loss and muscle atrophy, as this decay happens in months in space - saving more lives on Earth.

4 **SOLAR SYSTEM RESOURCES**

Resources including propellant from lunar ice, metals and water from asteroids. Exploring and extracting advances health, science and quality of life on Earth.

5 **EARTH AS AN OASIS**

Heavy industry, mining and power generation can happen off-planet, alleviating climate change.

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INDIA'S ASTRONOMICAL HERITAGE

सम्राट् यन्त्र

1. **The Moon's 27 mansions:** Vedic skywatchers divided the Moon's path into 27 nakshatras, or lunar mansions, one for each night of its 27.3-day circuit of the stars, and mission planners still time Moon flights by that same circuit.
2. **Aryabhata's spinning Earth:** In 499 CE Aryabhata wrote that the stars only seem to move because the Earth turns, and his figures give a day of 23h 56m 4s. When India built its first satellite in 1975, it carried his name.
3. **Zero becomes a number:** In 628 CE Brahmagupta set down the first known rules for arithmetic with zero and negative numbers inside an astronomy treatise, and every orbit is still computed with that arithmetic.
4. **The digits every spacecraft uses:** The digits 0 to 9 are an Indian invention that reached Baghdad in the 770s, where al-Khwarizmi's book spread them west and gave us the word "algorithm". Every spacecraft is navigated in those digits.
5. **Infinite series before Newton:** Around 1400 Madhava of Kerala found infinite series for the sine, cosine and arctangent, and pi to 11 decimals, two centuries before Europe did. Flight computers still compute those functions by series of that kind.
6. **Planets around the Sun, 1500:** Around 1500 Nilakantha of Kerala worked out that the five known planets go round the Sun, while the Sun itself goes round the Earth, a scheme Europe only reached with Tycho Brahe nearly ninety years later.
7. **The Jantar Mantar:** Jai Singh II's observatory at Jaipur, early 18th century, holds probably the largest sundial ever built, the 22.6 m Samrat Yantra, with a scale cut to 2-second marks.
8. **The names:** Chandrayaan is Sanskrit for Moon craft and Mangalyaan is Hindi for Mars craft, while NASA's Chandra X-ray telescope honours Chandrasekhar, who won the 1983 Nobel Prize for his work on the structure and evolution of stars.



UNESCO · ICOMOS-IAU · MACTUTOR · BRITANNICA · NASA · ISRO

INDIA'S MAJOR ADVANTAGES

FRUGALITY

India reached Mars orbit for Rs 450 crore and landed near the Moon's south pole for about Rs 615 crore, roughly $75 million. The Department of Space runs on Rs 13,706 crore in 2026-27, about $1.4 billion or one seventeenth of NASA's budget, and that has bought a Moon landing, a Mars orbiter, a solar observatory and a docking in orbit.

THE RULEBOOK

Since 2020 the government has rewritten the rules: IN-SPACe, a single regulator, now licenses private space companies, and since 2024 foreign investors may own 100 percent of a components company, 74 percent of a satellite company and 49 percent of a rocket company. The result is about 440 startups, $618.5 million of private investment and, in July 2026, a private rocket in orbit.

THE ENGINEERS

India graduates about 785,000 engineers a year with 4.3 million more enrolled, and its technology industry earns $315 billion a year while employing about six million people. ISRO itself has only 14,637 staff and works through about 450 industrial suppliers, so its cost advantage is really a talent advantage, and private companies hire from the same pool.

GEOMETRY

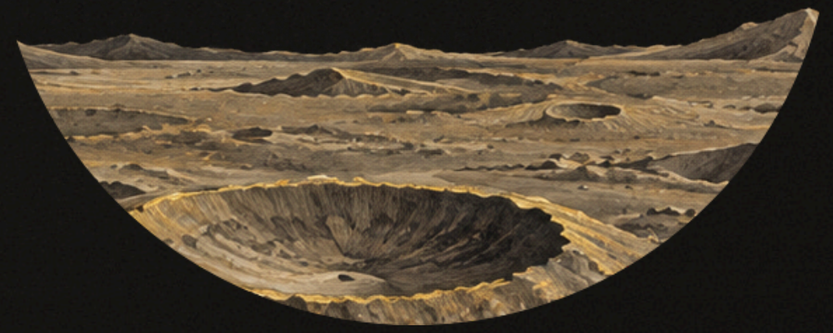
Sriharikota lies at 13.7 degrees north, so Earth's spin gives a rocket launched eastward over the Bay of Bengal 43 metres per second more than at Cape Canaveral. A rocket launched south must turn to miss Sri Lanka, which is why ISRO is building a second site at Kulasekarapattinam, 8.4 degrees north with open ocean due south, for small rockets from 2027-28.

THE HOME MARKET

Satellites guide crop insurance and flood alerts, carry 200 education channels and 179 telemedicine links, and report train positions 20 million times a day, while the government is fitting 100,000 fishing boats with satellite terminals for storm warnings, more than 40,000 so far. Bhuvan, India's geoportal, had 21.7 million users in 2025, and every new satellite has customers at home.







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INDIA IS THE VALUE ENGINEER FOR SPACE



Rs 450 cr

TO REACH MARS ORBIT ON THE FIRST ATTEMPT, 2014 ($73 MILLION)

1/17th

OF NASA'S BUDGET: RS 13,706 CRORE ($1.4 BILLION) AGAINST $24.4 BILLION

Rs 20,193 cr

BUDGET OF GAGANYAAN, THE CREWED PROGRAMME, WITH THE FIRST STATION MODULE ($2.1 BILLION)

THE PROOF

The Mars Orbiter Mission reached Mars orbit in September 2014 for **Rs 450 crore** ($73 million), ISRO's own figure, which made ISRO the fourth space agency at Mars, and Chandrayaan-3 landed near the Moon's south pole in August 2023 for about Rs 615 crore ($75 million). In January 2025 ISRO went on to dock two satellites in orbit.

THE BUDGET

The Department of Space has **Rs 13,706 crore** for 2026-27, about $1.4 billion, which is 0.26 percent of the Union Budget and 0.03 percent of GDP on the 2025-26 figures, against NASA's $24.4 billion for 2026. In rupees the allocation has been flat for five years.

THE METHOD

ISRO employs **14,637 people** at 20 centres and works through about 450 industrial suppliers and 130 academic institutions while keeping design in-house, and one rocket, the PSLV, carried India's first Moon, Mars and Sun missions. The cost advantage is a talent advantage, because India graduates about **785,000 engineers** a year with 4.3 million more enrolled.

THE OPEN MARKET

The government rewrote the rules from 2020, with IN-SPACe licensing private companies, and since 2024 foreign investors may own **100 percent of a components company**, 74 percent of a satellite company and 49 percent of a rocket company. The result is about 440 startups, $618.5 million of private investment and, in July 2026, Skyroot's Vikram-1, **India's first private rocket in orbit**.

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STORY = TALENT + CAPITAL + CLIENTS

ARTWORK Illustrations made for this briefing in September 2026, image-generation assisted, after a Jaipur miniature of about 1760 and a Mughal album folio (The Met, CC0) and Sudipta Maulik's photograph of the Jantar Mantar arches (CC BY-SA 4.0), via Wikimedia Commons; the observatory plate is shared under the same licence.

TALENT

Media creates excitement about the potential for India's space activities. **More STEM graduates at home, more talented space engineers looking to India** to build their career and the future of space.

INVESTMENT

Media attracts private investment from **VCs and angels**. It also lays the groundwork among retail investors for **public stocks, or tokenized funding projects**.

CLIENTS

Media reaches far more clients than door-to-door sales ever will - **not merely governments, but commercial enterprises, startups and research teams**. Reaching the world's space operators efficiently, at scale, takes a powerful, reputable brand - **built from day one**.

