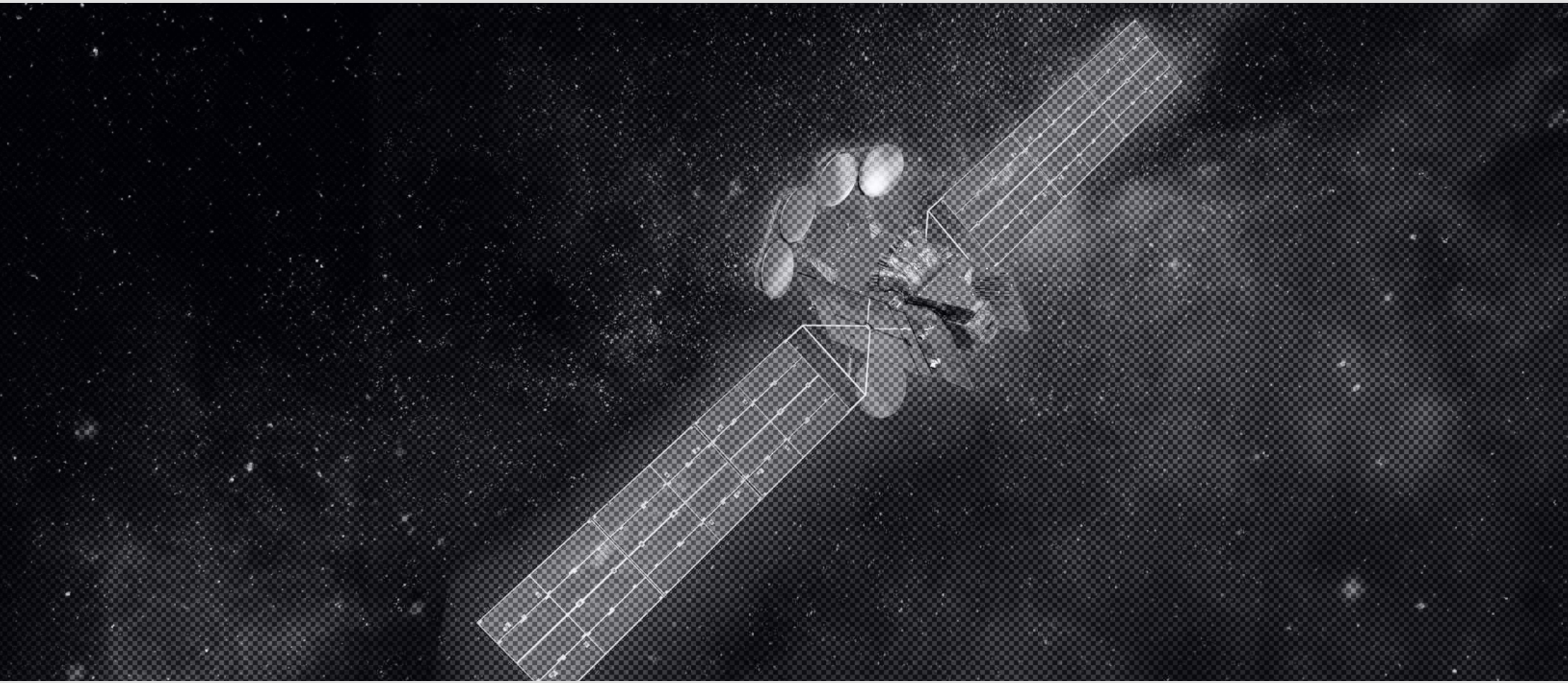
Unlocking India's Space Economy

Policy, Commercial Opportunities and Authorization for Private Enterprises

January 2025



This paper has been produced by Gateway Consulting, a public policy research firm dedicated to delivering insightful and impactful analyses on a wide range of policy issues, NewSky Plus, an advisory firm specializing in guiding space companies through compliance and go-to-market strategies and SIA-India, a not-for-profit space sector association focused on advancing the interests and growth of the space industry while promoting innovation through strategic engagements with governments, policymakers, regulatory bodies, and standardization entities.

Several reports authored by the organizations can be found on their website and LinkedIn page.

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Foreword

India's space sector is entering a decisive phase marked by significant potential, strategic direction, private participation and government support. From space transportation systems and remote sensing to lunar exploration, earth observation, reusable vehicle launches and low-cost spacecraft development, India has certainly become a key player on the global stage. This was further exemplified by the success of India's Chandrayaan-3 mission, which made India the fourth country to land on the moon and the first to land on its South Polar region.

Having contributed to developing the country's space programs during my tenure as ISRO Chairman and Secretary, Department of Space, I have witnessed the sector's evolution and recognize its significant potential for growth. The current space policy framework reflects a positive effort to align regulatory structures with technological advancements and commercial opportunities. Initiatives such as the Indian Space Policy 2023, the establishment of the Indian National Space Promotion and Authorization Centre (IN-SPACe), and the liberalization of Foreign Direct Investment (FDI) norms exemplify the government's commitment to fostering private sector participation and attracting foreign investment. These measures provide much-needed regulatory clarity and facilitate smoother market entry for domestic and international stakeholders.

This paper, 'Unlocking India's Space Economy: India's Space Regulatory Handbook,' offers a structured overview of the policies and processes shaping the space sector. It serves as a practical guide for global companies seeking to engage with the Indian space market, providing detailed insights into authorization processes, investment frameworks, and compliance requirements.

With India targeting a five-fold increase in its share of the global space economy by 2030, this handbook will be instrumental in supporting effective collaboration between public and private entities. It offers a valuable reference for policymakers, entrepreneurs, and industry stakeholders to equip them to navigate the opportunities and challenges within India's evolving space landscape.

Dr. K Sivan
Former Chairman,
Indian Space Research Organisation and
Former Secretary,
Department of Space

Abbreviations

- CII - Confederation of Indian Industry
- DoT - Department of Telecommunications
- DPIIT – Department for Promotion of Industry and Internal Trade
- DST – Department of Science and Technology
- FDI - Foreign Direct Investment
- FSS – Fixed Satellite Services
- GMPCS - Global Mobile Personal Communication by Satellite services
- GSD - Ground Sample Distance
- INSAT - Indian National Satellite System
- ISpA - Indian Space Association
- IN-SPACe - Indian National Space Promotion and Authorization Centre
- ISRO - Indian Space Research Organisation
- LEO – Low Earth Orbit
- MCC - Mission Control Center
- MOM - Mars Orbiter Mission
- NASA - National Aeronautics and Space Administration
- NGE- Non-Government Entity
- POEM - PSLV Orbital Experimental Module
- SCC - Satellite Control Center
- SIA-India - SatCom Industry Association
- SSA - Space Situational Awareness
- TT&C - Telemetry Tracking and Command
- WPC - Wireless Planning and Coordination Wing

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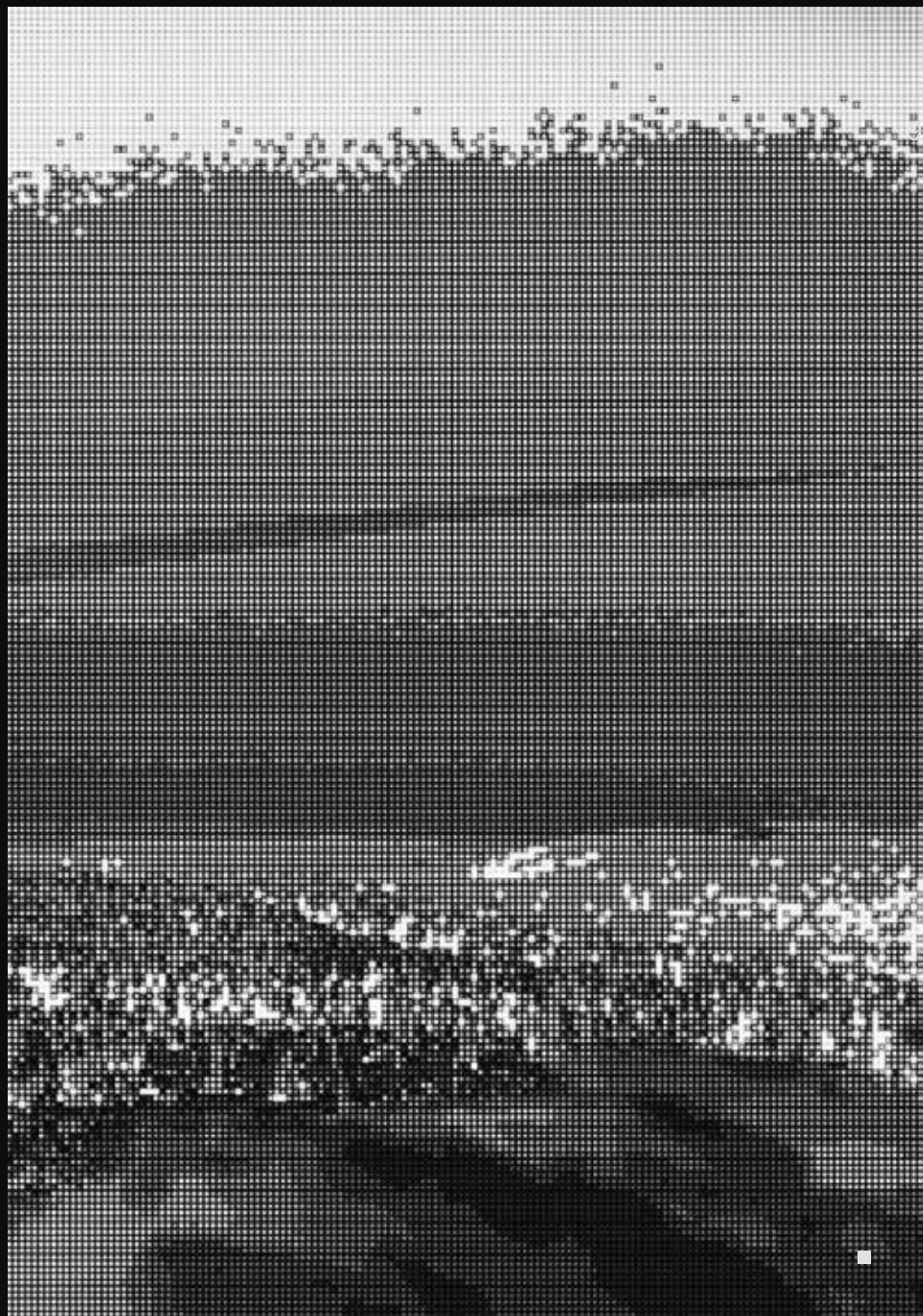


Introduction

India's space sector has emerged as a key driver in the country's technological advancement and global influence. With cost-effective missions and groundbreaking achievements, India's space program has not only propelled scientific exploration but also provided essential services for its citizens. From satellite-based communication and remote sensing to weather forecasting and navigation, space technology has become an integral part of India's socioeconomic development and national security.

The government's decision to open the space sector to private participation has created opportunities for accelerated innovation and development. This move is expected to foster collaboration between public and private entities, attract foreign investments, and advance satellite technology, launch vehicles, and geospatial applications. Beyond economic gains, space technologies are becoming essential to India's national development, contributing to sectors such as agriculture, disaster management, and environmental monitoring.

Increased investment in space technologies offers numerous benefits across various sectors, with substantial public advantages. Satellite broadband can bring high-speed internet access to remote and rural areas, bridging the digital divide and enabling access to essential services like education, healthcare, and e-governance. In agriculture, satellite-based weather forecasting and earth observation data can help farmers make informed decisions on crop selection, planting schedules, and resource management, potentially increasing yields and reducing weather-related risks. These technologies also play a critical role in disaster management by providing real-time environmental monitoring, supporting early warning systems for natural disasters, and facilitating rapid emergency responses. By developing and utilizing these space-based technologies, India can improve quality of life for its citizens, enhance economic productivity, and strengthen resilience to environmental challenges.

India's space program has made significant progress over the past few decades, positioning the nation as a leading force in the development of space technology. From space transportation systems and remote sensing to lunar exploration, earth observation, reusable vehicle launches and low-cost spacecraft development, India has certainly become a key player on the global stage[1].

India's commitment to regional and global cooperation is evident through its strategic initiatives in space technology, which contribute to both the development of SAARC nations and the broader international community. The following points highlight key efforts made by India through ISRO and other space-related programs:

- **NAVIC (Navigation with Indian Constellation):** A regional satellite navigation system developed by ISRO, provides accurate positioning and timing information over India and surrounding regions. There are plans to expand its coverage to 3,000 kilometers which will directly benefit SAARC nations—Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka—by improving connectivity, transportation, disaster management, and telecommunications[2].

International Stations Supported by ISRO: ISRO supports global space operations through stations in Brunei, Indonesia, and Mauritius, which play a vital role in satellite tracking and space technology cooperation[3].

COSPAS-SARSAT Program: India also participates in this international satellite-aided search and rescue program, providing critical services to countries like Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka, and Seychelles, supporting disaster response and humanitarian efforts[4] .

ISRO's Expanding Global Participation: As of 2023, ISRO has launched 432 foreign satellites out of which 397 have been launched in the period from 2013-2023[5].

1 https://www.isro.gov.in/media_isro/pdf/Publications/Innovation_Space_Tech.pdf
2 https://economictimes.indiatimes.com/news/india/how-isro-plans-to-boost-indias-gps-alternative-navics-reach--beyond-indias-borders/articleshow/103991068.cms
3 https://www.isro.gov.in/ISTRAC.html

4 https://www.isro.gov.in/SatelliteAidedSearchAndRescue.html
5 https://www.wionews.com/india-news/isro-has-launched-397-foreign-satellites-in-10-years-earning-usd-157-million-670042
6 https://www.isro.gov.in/Mission.html
7 https://pib.gov.in/PressReleasePage.aspx?PRID=1951137

The Indian Space Research Organization (ISRO), one of the world's largest space agencies, has spearheaded this progress, launching 124 spacecraft missions . The organisation's flagship initiatives, such as the Chandrayaan lunar exploration program, have achieved significant milestones:

2008

Chandrayaan-1
Successfully conducted chemical, mineralogical, and photo-geologic mapping of the Moon.

2013

Mars Orbiter Mission (MOM) India's first interplanetary mission, launched to study the Martian surface, morphology, mineralogy, and atmosphere.

2019

Chandrayaan-2
Aimed to map and study variations in the lunar surface composition and the presence of water on the Moon.

2023

Chandrayaan-3
Achieved a historic soft landing in the Moon's south polar region, making India the fourth country to do so[7].

2024

Gaganyaan
India's first independent human spaceflight program with a budget of Rs. 10,000 crore (USD 1.2 billion), set to launch its first mission in October 2024.

- **NISAR (NASA-ISRO Synthetic Aperture Radar):** This is a joint satellite mission between NASA and India's Space Research Organisation (ISRO). The satellite will use radar technology to map and monitor changes in Earth's surface. The launch of this mission is planned for early 2025 .

- **Aditya L1 Mission:** Scheduled for launch in early 2025, this mission aims to study solar activities, space weather, and their impact on Earth's climate .

- **Chandrayaan- 4:** Chandrayaan-4 mission aims to bring lunar samples back to Earth. This will be the fourth mission in India's Chandrayaan moon exploration program. While still in early planning stages, the mission has received government funding of Rs 2,104 crore (USD 250 million) and is tentatively scheduled to launch in 2028 or later .

- **Bharatiya Antariskh Station (BAS):** The BAS is India's first planned modular space station, being developed by ISRO to enhance India's capabilities in space exploration and research. The first module of the station, BAS-1, is scheduled for launch by 2028, with the full space station expected to become operational by 2035 .

In July 2024, the Indian government announced the establishment of a Rs. 1,000 crore (USD 120 million) venture capital fund to further expand the country's space economy.IN-SPACe is currently working on formulating a process outlining the disbursal of capital from this fund. Additionally, In the Union budget for 2024-25, the government allocated Rs. 13,042.75 crore (approximately USD 1.56 billion) for the Department of Space, marking an increase of 4.4 percent from Rs. 12,543.91 crore (around USD 1.51 billion) in the previous year, 2023-24 . Further, funding for the Indian

9 https://www.isro.gov.in/Aditya_L1.html
10 https://www.financialexpress.com/life/science/chandrayaan-4-mission-union-cabinet-approves-new-moon-mission-details-inside/3614615/
11 https://www.business-standard.com/india-news/isro-s-bharatiya-antariksha-station-5-module-design-to-take-flight-by-2035-124100900420_1.html

National Space Promotion and Authorization Center (IN-SPACe) also grew significantly by over 300 percent from Rs. 20.91 crore (about USD 2.5 million) in 2022-23 to Rs. 96 crore (approximately USD 11.5 million) in 2024-25, reflecting a strong push to support the expansion of the private sector in India's space economy .

Recognizing the immense potential for growth and innovation, the Department of Space drafted the Space Activities Bill in 2017 to promote and regulate India's space activities, particularly emphasis by encouraging private and non-governmental participation. Although the bill lapsed in 2019, it set the stage for future developments in the sector.

In 2023, ISRO unveiled its Vision 2047, outlining ambitious goals to advance India's space capabilities, including enhancing satellite communication, improving imaging technology, expanding space science missions, developing advanced launch vehicles, and establishing a human spaceflight program.

Consistent with these aspirations, the Government of India introduced a forward-looking Indian Space Policy in 2023. This comprehensive policy overhaul is designed to unlock the full potential of private and non-governmental entities (NGEs) in India's space sector. Governed by the newly established Indian National Space Promotion and Authorization Centre (IN-SPACe), the policy provides a regulatory framework to facilitate, promote, and supervise commercial space activities.

This paper aims to provide a comprehensive guide to understanding the regulation of India's space sector regulations. We will explore the Indian Space Policy 2023, the procedures for securing authorizations, FDI norms, guidelines on communication services, orbital resource utilisation, remote sensing data dissemination, space transportation systems, ground infrastructure establishment, and liability considerations.

8 https://www.isro.gov.in/Aditya_L1.html
9 https://www.financialexpress.com/life/science/chandrayaan-4-mission-union-cabinet-approves-new-moon-mission-details-inside/3614615/
10 https://www.business-standard.com/india-news/isro-s-bharatiya-antariksha-station-5-module-design-to-take-flight-by-2035-124100900420_1.html

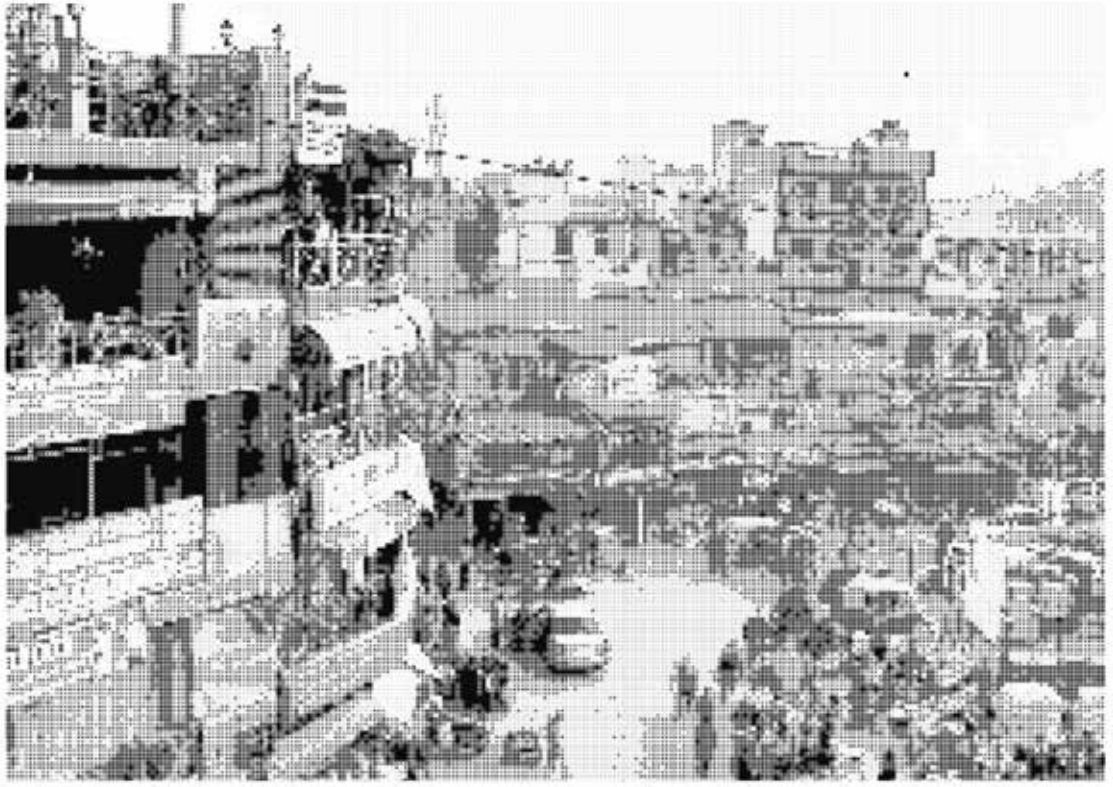
Market Size of the Indian Space Industry

As of 2024, the Indian space industry is estimated to be valued at around USD 8.4 billion, accounting for around 2-3 percent of the global space economy.

The Indian government has set an ambitious target to increase its share of the global space economy five-fold by 2030, aiming to grow from the current 2 percent to 10 percent.

According to projections by IN-SPACe, India's space industry could reach a market size of USD 44 billion by the year 2033

The Department for Promotion of Industry and Internal Trade (DPIIT) reported that the number of space start-ups in India grew to 189 in 2023, a significant increase from just one start-up in 2014. Further, these startups attracted investments totalling USD 135 million in the financial year 2023-24, up from USD 115 million in FY 2022-23 and USD 80 million in FY 2021-22 .



12 https://www.thehindu.com/sci-tech/science/18-hike-for-department-of-space-in-union-budget-lions-share-for-development-of-space-technologies/article68436318.ece
13 https://www.cnbctv18.com/india/science/budget-2024-space-sector-allocation-nirmala-sitharaman-isro-19446952.htm
14 https://www.investindia.gov.in/sector/space
15 https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf
16 https://www.business-standard.com/industry/news/india-targets-5-fold-increase-in-share-of-global-space-economy-by-2030-124030501028_1.html

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The table below shows market size estimates and projections for various domains within India's space sector from 2022 to 2033. The data is organized into three main groups:

- Space-for-Earth: This group, which includes Earth Observation, Communication, and Navigation, shows the largest market size. In 2022, this segment was estimated at 7 billion USD, with projections indicating significant growth to 32.1 billion USD by 2033.

- Access-to-Space: Encompassing satellite manufacturing, launch services, and ground segment activities, this sector's market size was estimated at 1.3 billion USD in 2022, with expectations of substantial growth to 10.6 billion USD by 2033.

- Space-for-Space: Covering space situational awareness, in-orbit economy, and space exploration, this represents the smallest but potentially fastest-growing segment. From a modest 0.1 billion USD in 2022, it's projected to reach 1.3 billion USD by 2033.

Market Size Estimates for the Space Sector in India[18]

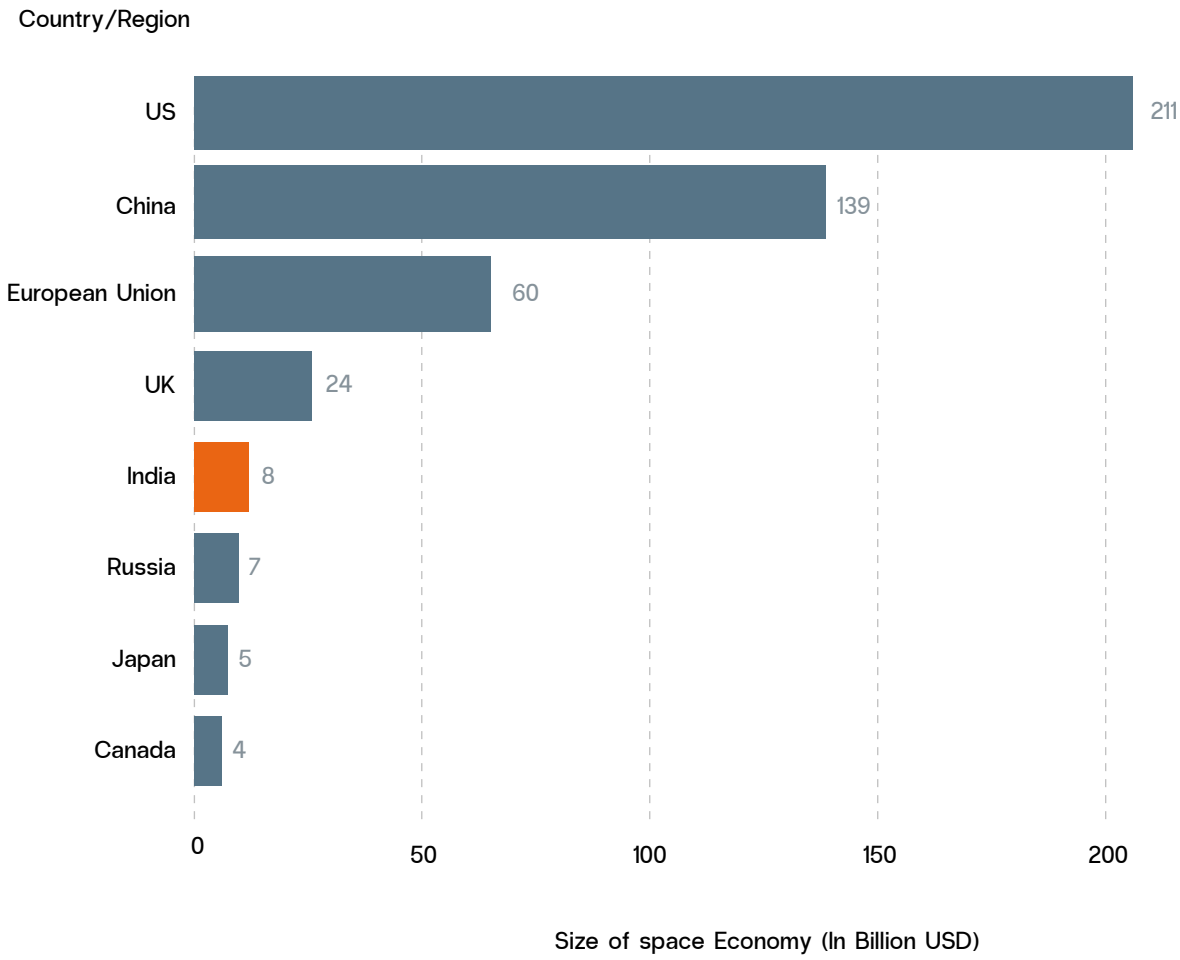
Groups	Space domains	Market size estimate, 2022 (USD Billion)	Market size projections, 2033 (USD Billion)
Space-for-Earth	Earth Observation (EO)	7	32.1
	Communication		
	Navigation		
Access-to-Space	Satellite manufacturing	1.3	10.6
	Launch Service		
	Ground segment		
Space-for-Space	Space situational awareness	0.1	1.3
	In-orbit economy and Space Exploration		
Total		8.4	44

17 https://government.economictimes.indiatimes.com/news/governance/number-of-space-startups-have-gone-up-from-1-in-2014-to-189-in-2023-jitendra-singh/106007959

18 https://www.inspace.gov.in/sys_attachment.do?sys_id=f461d9698775f1104efb31d60cbb35df

The chart shows the size of the space economy across various countries and regions, measured in billion USD. India, ranked as the fifth-largest space economy globally, has a valuation of 8 billion USD, following the:

- United States (211 billion USD),
- China (139 billion USD),
- European Union (60 billion USD),
- United Kingdom (24 billion USD),
- Vand Russia (7 billion USD).



Government Driven Demand for Satellite Data and Analytics

Several government initiatives in India are increasingly relying on satellite data to support various development goals, particularly in rural development, infrastructure planning, and governance. By leveraging satellite-based remote sensing technology, these initiatives aim to improve the accuracy and efficiency of land records, property rights, and administrative processes. These efforts are expected to continue driving the growth of satellite data and analytics in the near future. Some of these initiatives are as follows:

SWAMITVA Scheme: Launched in 2020, the SWAMITVA Scheme uses satellite imagery to map rural areas and provide legal property documentation to households, reducing land disputes and improving land record accuracy. As of July 2023, over 2,70,924 villages have been mapped under the initiative, helping to issue a 'Record of Rights' and promoting transparency in rural property ownership[19].

Gati Shakti Initiative: The Gati Shakti Initiative aims to enhance infrastructure development and logistics efficiency by leveraging satellite data for better project planning and execution. By integrating multiple transportation modes and streamlining processes, the initiative helps improve economic growth and infrastructure planning, enabling more effective, data-driven decision-making[20].

Mission Mausam: In September 2024, the Union Cabinet, approved Mission Mausam with an allocation of Rs 2,000 crore (around USD 240 million) over two years[21]. The mission aims to strengthen research and development in atmospheric sciences, weather surveillance, modelling, forecasting, and management. Key components of the mission include the deployment of next-generation radars and satellite systems, supercomputers, enhanced earth system models, and a GIS-based Decision Support System for real-time data dissemination.

Bharatnet: BharatNet is one of the largest digital connectivity initiatives globally, with the goal of delivering broadband access to rural areas throughout India. Satellite communication is one the major components of the initiative to improve digital infrastructure, particularly in remote regions where traditional terrestrial connectivity is limited[22].

Defence Initiatives: In February 2024, Chief of Defence Staff Gen Anil Chauhan announced that the Indian armed forces plan to invest Rs 25,000 crore (approximately USD 3 Billion) to meet their defence space needs. This includes requirements such as building a constellation of surveillance satellites to secure communications networks[23].

19 https://svamitva.nic.in/svamitva_hindi/
20 https://www.india.gov.in/spotlight/pm-gati-shakti-national-master-plan-multi-modal-connectivity
21 https://www.thehindu.com/news/national/cabinet-approves-2000-crore-mission-mausam/article68631490.ece
22 https://usof.gov.in/en/bharatnet-project
23 https://economictimes.indiatimes.com/news/defence/armed-forces-line-up-rs-25000-crore-to-boost-defence-space-capabilities-cds-gen-chauhan/articleshow/107490314.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Regulatory Landscape

Before the introduction of the Indian Space Policy in 2023, India's space sector was governed by a patchwork of policies, each addressing specific aspects of space activities. The regulatory framework included several key policies:

- Satellite Communication Policy 1997: This policy aimed to foster the development of the satellite communications service industry and domestic ground equipment, while also regulating foreign direct investment in the sector.

- Revised Remote Sensing Data Policy 2011: Initially introduced in 2001 and revised in 2011, this policy governed the collection and transmission of satellite remote sensing data by private players, whether from both Indian and or foreign satellites

- National Geospatial Policy 2016: This policy focused on developing geospatial infrastructure, skills, and capabilities, as well as improving access to geospatial data to enhance citizens' lives and enable private business activities.

Under this regulatory framework, private entities needed to secure approvals from multiple government agencies, including the Department of Space (DoS), Department of Telecommunications (DoT), and Ministry of Information and Broadcasting (MIB). These agencies often had divergent, and sometimes conflicting, objectives, which complicated the approval process for space-related ventures.

Historically, ISRO dominated India's space sector, acting as the primary designer and operator of space assets. Private companies were largely confined to supplying components to ISRO, with limited involvement in actual space operations. ISRO's commercial arm, Antrix, handled international sales of services like satellite launches and imagery. Unlike other countries, India lacked private space firms that could serve domestic or global markets[24].

24 Rajagopalan, R. P., & Prasad, N. (2023). India's strategy and space resource ambitions. Routledge

Indian Space Policy 2023 (ISP 2023)

In April 2023, the Department of Space introduced the Indian Space Policy 2023, marking a strategic shift in the country's approach to space exploration and commercialization:

- Strategic Shift in ISRO's Role: The policy redefined ISRO's role, steering the organization away from manufacturing operational space systems. to being focused on advancing research and development in space exploration technologies.

- Opening Up the Sector: The Indian Space Policy 2023 allows private companies and non-governmental organizations to participate in a broad range of space activities. These include launching and managing satellites, space stations, and other space objects; establishing and operating ground-based facilities for space operations; providing comprehensive services for the safe upkeep of space assets; and developing and operating space transportation systems, launch infrastructure, and space object management facilities.

- Encouraging Innovation and Investment: The policy is designed to open up space activities to non-government entities, foster innovation within the space sector, attract foreign investment, and significantly boost India's share of the global space economy.

- Streamlining Approvals: The policy also aims to streamline approval processes for conducting commercial space activities, support startups, and encourage the commercialization of space technologies

Telecommunications Act, 2023

The Telecommunication Act, 2023, introduced key updates to India's telecommunications regulatory framework, including important provisions for the satellite communication (satcom) sector. The Act streamlined the process for satellite communication spectrum allocation, shifting from the traditional auction-based system to an administrative allocation model . This change allows companies to obtain the necessary spectrum to operate satcom services without the competitive bidding process used for terrestrial services. The Telecom Regulatory Authority of India (TRAI) is currently conducting stakeholder consultations on the modalities of this administrative allocation and is expected to release its final recommendations soon.

Flight and Maritime Connectivity (IFMC) Rules, 2018

Released in 2018, This policy regulates the provision of internet and mobile communication services on aircraft and ships within Indian airspace and territorial waters, allowing service providers to use both Indian and foreign satellite systems.

National Digital Communications Policy, 2018

The National Digital Communications Policy (NDCP), 2018 is a comprehensive framework that outlined policy measures to transform India's digital communications sector from 2018 to 2022 in areas like 5G, the Internet of Things (IoT), and artificial intelligence .
Additionally, the Department of Telecommunications (DoT) is working on a new NDCP that will outline growth strategies and set targets for the telecom sector over the next five years . This updated policy will focus on various segments, including emerging technologies, local manufacturing, the identification of new spectrum bands, and the roadmap for 6G.

Benchmarking with Other Jurisdictions

Sr. No.	Country	Policy Framework for Getting Authorizations for Commercial Space Activities
1	United States	The Federal Aviation Administration (FAA) Office of Commercial Space Transportation regulates the safe operation of commercial space transportation. A license from the FAA is mandatory for any launch, re-entry, or operation of a launch or re-entry site by U.S. citizens globally or by any entity within the U.S. However, FAA licenses are not needed for government-conducted space activities, such as certain NASA or Department of Defense launches.
2	United Kingdom	The UK Space Agency (UKSA) is the nodal agency responsible for authorizing space activities. The process for conducting commercial space activities involves engaging with the UKSA for pre-application consultation, submitting a detailed application including technical, operational, and financial information, and undergoing a thorough assessment and review by the agency. Upon meeting all regulatory requirements, the UKSA grants the necessary licenses, which must be complied with through continuous monitoring and reporting.
3	Japan	In Japan, the authorization for space activities is governed by the Space Activities Act of 2016, which established licensure regulations for launches and satellite operations, ensuring compliance with the Outer Space Treaty. Additionally, the Remote Sensing Data Act of 2016 sets rules for satellite remote sensing to prevent misuse of high-resolution commercial imagery
4	India	The Indian National Space Promotion and Authorization Centre (IN-SPACe) is an autonomous, centralized agency within the Department of Space. IN-SPACe has been tasked with authorizing and regulating all space activities undertaken by non-governmental entities (NGEs) in India.

Establishment of In-SPACe

- The Indian Space Policy 2023 established the Indian National Space Promotion and Authorization Centre (IN-SPACe) as an autonomous, centralized agency under the Department of Space. IN-SPACe is responsible for authorizing and regulating all space activities conducted by non-governmental entities (NGEs) in India.

- In April 2024, IN-SPACe issued the Norms, Guidelines and Procedures for implementing the Indian Space Policy 2023. These guidelines provide a comprehensive framework for the authorization of space activities by NGEs[29].

- These guidelines ensure that all space operations comply with national and international laws. They outline the requirements for obtaining authorization, maintaining continuous compliance, meeting safety standards, managing changes in control or management, and specifying conditions for discontinuing operations. These guidelines are crucial for ensuring that space activities in India are conducted safely and in a well-regulated manner.

Taxation on Commercial Space Activities

- In July 2023, the Union Government extended a significant tax relief to private organizations involved in satellite launch services by exempting them from the Goods and Services Tax (GST). . Previously, this exemption was available only to ISRO, along with government-owned entities New Space India Limited (NSIL) and Antrix Corporation.

- Additionally, satellites, payloads, and their ground testing equipment are now fully exempt from both basic customs duty and Integrated GST, providing further financial relief for space-related ventures.

- A concessional rate of five percent basic customs duty and five percent GST is also applied to scientific and technical instruments, equipment, and related materials needed for launch vehicles, satellites, and payloads.

29 https://www.inspace.gov.in/sys_attachment.do?sys_id=5d532e37877102503b0f0d060cbb35cf

FDI Norms for Commercial Space Activities in India

In April 2024, the Union Government liberalized foreign direct investment (FDI) norms for the space sector, opening up the industry to greater foreign participation and investment. The table below outlines the revised FDI thresholds across different space activities:

Under India's FDI framework, investments can be made either through the Automatic or Government route:

- Automatic Route: No approval is required from the Reserve Bank of India (RBI) or the Government of India for investments up to the specified threshold.
- Government Route: prior approval of the Government of India, the Ministry of Finance and the Foreign Investment Promotion Board (FIPB) is required.

Sr. No.	Space Sector/Activity	Sectoral Cap	Entry Route
1	Satellites Manufacturing and Operation	100 Percent	Up to 74 Percent: Automatic Route Beyond 74 Percent: Government route
	Satellite Data Products		
	Ground Segment and User Segment		
2	Launch Vehicles and associated systems or subsystems	100 Percent	Up to 49 Percent: Automatic Route Beyond 49 Percent: Government route
	Creation of Spaceports for launching and receiving Spacecraft		
3	Manufacturing of components and systems/sub-systems for satellites, ground segment and user segment	100 Percent	Up to 100 Percent: Automatic Route

Commercial Activities Permitted Under the Indian Space Policy, 2023

1. Establishment and Operations of Space Objects
This category of commercial activities encompasses the establishment and operation of satellites or constellations for communication services such as broadband internet and calling, as well as remote sensing and amateur satellite systems. It includes the management of payloads owned by Indian entities hosted on foreign satellites, payloads of Indian or non-Indian entities hosted on Indian satellites, and payloads hosted on PSLV Orbital Experimental Module (POEM) or similar platforms. This category also covers the establishment and operation of space objects other than communication and remote-sensing satellite systems.

2. Operations of Space Transportation Systems
This category of commercial activities involves undertaking sub-orbital and orbital launches from Indian territory and/or outside the territory of India. It also includes the establishment and operation of launch facilities by Indian entities, which could be self-owned, leased, or mobile platforms located within or outside the territory of India.

3. Planned Re-Entry of Space Objects
This category of commercial activities involves a controlled process where a space object's descent is carefully managed.

4. Establishment and Operations of Ground Stations
This set of commercial activities covers the establishment and operations of satellite control centres (SCC), including telemetry, tracking, and command (TT&C) facilities and mission control centres. It also includes remote sensing or amateur satellite data reception stations, ground-based sensors for space situational awareness (SSA) related observations, and ground systems such as TT&C, mission control centres, radars, mobile terminals, and others for supporting the operations of space transportation systems.

5. Dissemination of Space-Based Earth Observation/Remote Sensing data
This set of commercial activities includes disseminating high-resolution space-based earth observation/remote sensing data about Indian territory. It also includes the dissemination of primary data on Indian territory and greater than 30cm ground sample distance (GSD) at nadir from earth observation/remote sensing satellites.

6. Sale/ purchase/ transfer of Space Objects In-Orbit
Commercial transactions involving satellites or other space assets that are already in space. This includes the transfer of ownership from one entity to another, which can occur for various reasons, such as mergers, acquisitions, or the need for different operational management.

Process for Seeking Authorisation to Conduct Commercial Space Activities

The Norms, Guidelines and Procedures (NGP) for implementing the Indian Space Policy 2023 are specifically designed to outline the authorization requirements for private companies conducting space activities within India. This document serves three crucial purposes:

- Comprehensive Authorization Requirements: It provides a clear and detailed list of space activities that require official authorization from IN-SPACe, ensuring that companies understand which operations fall under regulatory oversight.

- Evaluation Criteria: The NGP outlines the specific criteria that IN-SPACe will use to evaluate and grant authorizations. This allows potential applicants to understand the standards they must meet to gain approval.

- Compliance and Maintenance Guidelines: It details the necessary conditions and guidelines that applicants must adhere to when seeking and maintaining authorization, ensuring that they remain in compliance with all relevant regulations.

The flow chart below illustrates the process for seeking authorisation to conduct commercial space activities in India:

Application Submission	Submit the Online Application via the IN-SPACe Digital Platform (IDP).
Preliminary Assessment	IN-SPACe reviews credentials and capabilities of applicant entity. Additional information may be requested from the Applicant.
Acknowledgement of Application	In-SPACe to confirm if the application is accepted for further processing.
Application Scrutiny	Applications will be assessed based on safety, security, technical criteria, RF interference, compliance with national & international guidelines
Provisional Authorisation	This authorisation will be issued to help get approvals from other ministries.
Final Approval or Rejection	IN-SPACe to issue the final approval or reject the application within 75-120 days of receipt of initial application.

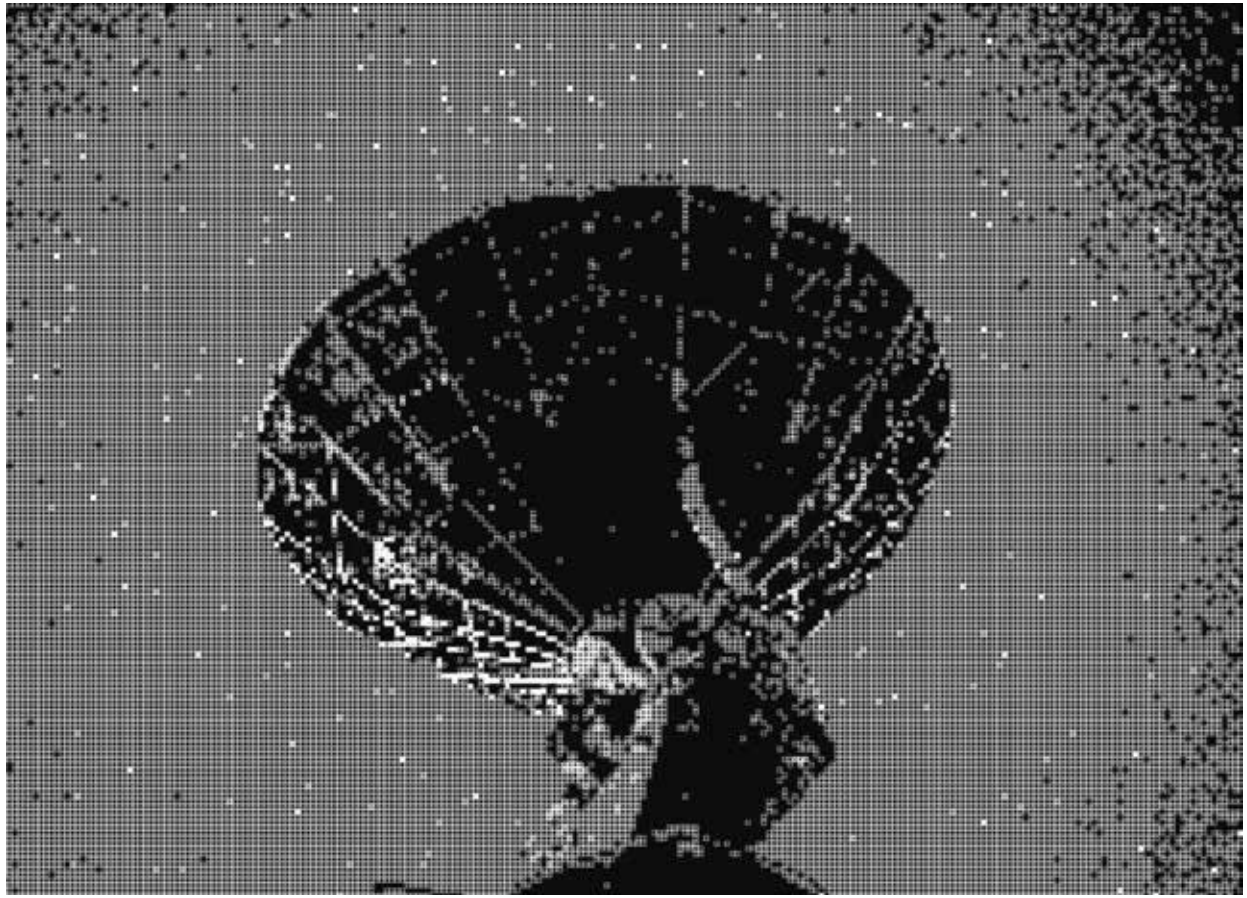
These amendments to the FDI policy, effective from 16 April 2024, mark a notable shift in the country's approach to foreign participation in the space industry, opening up various sub-sectors to increased foreign investment.

Impact of Revised FDI Policies for Entities Looking to Conduct Commercial Space Activities in India:

- Easier Entry: The policy simplifies the entry process for foreign companies by allowing up to 74% FDI in satellite-related activities and 49% in launch vehicles through an automatic route.

- Partnership Incentives: The revised norms encourage foreign entities to collaborate with Indian firms, promoting technology and knowledge transfer.

- Market Access: Establishing or partnering with local firms provides foreign entities with greater access to India's expanding space market and potential involvement in government-led projects.



30 https://economictimes.indiatimes.com/tech/startups/space-startups-industry-bodies-welcome-gst-exemption-for-satellite-launch-services/articleshow/101702232.cms

31 https://sansad.in/getFile/loksabhaquestions/annex/182/AU2146_aRm371.pdf?source=pqals

Authorisations for Various Commercial Space Activities

1. Guidelines for Space-Based Communication Services

- Any satellite or constellation owned by an Indian entity requires authorization from IN-SPACe to provide communication services over India or outside Indian territory.

- Non-Indian satellites or constellations also need IN-SPACe authorization, through an Indian entity, to provide communication services within Indian territory, regardless of whether they use Indian or non-Indian orbital resources.

- Indian entities can seek IN-SPACe authorization to establish, operate, procure, or lease satellites or constellations using Indian or non-Indian orbital resources for communication services covering Indian territory and/or areas outside India.

- Only satellites or constellations authorized by IN-SPACe can be used by Indian service providers or users to provide or receive space-based communication services.

- IN-SPACe may grant non-interference-based authorization if the new satellite does not interfere with existing services, but the new entrant must coordinate with incumbents to avoid harmful interference, or IN-SPACe may intervene or terminate authorization.

- For providing satellite-based communication services in India, companies also need a global mobile personal communication by satellite services (GMPCS) license.

- The GMPCS license issued by the Department of Telecommunications (DoT) allows operators to provide transnational, regional or global coverage from a constellation of satellites to end-users, including voice, fax, messaging, data and broadband multimedia services.

- However, the application and approval process for this license is completely independent of authorizations issued by In-SPACe.

2. Guidelines for Orbital Resources

Identification and Consolidation of Unutilized Resources

Identification of Unutilized Orbital Resources	Criteria for Making Orbital Resources Available to Commercial Entities	What Will this Announcement of Opportunity (AO) Document Contain?	Application and Evaluation Process	Other Details
IN-SPACe will consolidate existing Indian Unutilized Coordinated/Allotted Orbital Resources or Unutilized ITU Filings in coordination with WPC (Wireless Planning & Coordination, DoT) through a consultative process.	The selection will be based on an Announcement of Opportunity (AO) document published by IN-SPACe. Only Indian Entities with "Indian Management and Control" can participate.	Details of identified Unutilized Filings/Resources and criteria for evaluating applicants like managerial, operational, technical, and financial capabilities.	Entities will apply based on the AO. Evaluation and selection of beneficiaries will be done as per the criteria outlined in the AO document.	IThe selected beneficiary will receive an 'Advisory Note' from IN-SPACe permitting resource use and must make payments to WPC. WPC and IN-SPACe will monitor progress, with potential cancellation/revocation for lack of progress. The beneficiary can relinquish the resource, which will then be offered to the next shortlisted applicant

3. Guidelines for Applying for a Fresh ITU Filing under Indian Administration through WPC

Application Process	Evaluation and Due Diligence	Transfer/Subletting
The Applicant, who intends to make a new ITU Filing under the Indian Administration for the establishment and/or operation of a Space Object for communication services, shall apply to IN-SPACe on IDP in the stipulated format.	IN-SPACe shall apply due diligence while evaluating the applications for the new ITU Filings about the possibility and potential of the fructification of the proposed ITU Filing by the Applicant within the stipulated period.	The Applicant shall be allowed to transfer/sublet the ITU Filing or the frequency assignment to any other Indian Entity (who intends to establish and/or operate space-based system for communication), subject to the approval of IN-SPACe and meeting other relevant criteria.

4. Guidelines for Dissemination of Remote Sensing Data

- Any earth observation/remote sensing data with a ground sampling distance (GSD) of 30 cm or less at nadir is considered 'high resolution data'.

- Indian entities require authorization from IN-SPACe to disseminate high resolution (≤30 cm GSD) data pertaining to Indian territory, where dissemination includes supply, sale, distribution, or providing direct download of the data.

- To disseminate high resolution data (≤30 cm GSD), Indian entities must apply to IN-SPACe as a data disseminator, and the authorization considers factors like satellite registration, security, ownership, and national interests.

- For data with a GSD greater than 30 cm, Indian entities must register with IN-SPACe as data disseminators for commercial transactions and periodically intimate IN-SPACe about each commercial dissemination transaction, while non-commercial dissemination does not require registration.

- Data disseminators must verify user credentials, maintain dissemination records, report to IN-SPACe periodically, use data from authorized/registered disseminators for value-added products, and inform IN-SPACe about changes in management control, ownership.

- IN-SPACe can declare any data sensitive and prohibit dissemination for national interests.

5. Establishment and Operations of Ground Systems

Authorization from IN-SPACe is required for the establishment/operation of:

- Satellite Control Center (SCC)
- Telemetry, Tracking and Command (TT&C) stations
- Mission Control Center (MCC)
- Remote sensing data reception stations
- Ground stations for space situational awareness, astronomy, navigation etc.
- Any other category specified by IN-SPACe

- After obtaining authorization from IN-SPACe, the necessary clearances and approvals from other relevant ministries must be secured.

- No authorization from IN-SPACe is required for establishing gateways or hubs that support satellite communication services such as Direct-to-Home (DTH), Digital Satellite News Gathering (DSNG), or Very Small Aperture Terminal (VSAT) services.

- Indian entities can commercially provide ground station services (Ground Station as a Service) after receiving authorization from IN-SPACe.

- Ground stations can be established within India or outside the country. However, for locations outside India, the applicant must demonstrate security and strategic advantages.

- Any transfer of operational ground stations between Indian and non-Indian entities requires approval from IN-SPACe. Additionally, certain areas may be designated as prohibited for the establishment of Telemetry, Tracking, and Command (TT&C) or Mission Control Center (MCC) stations.

6. Establishment and Operation of Launch Facilities

- Only Indian entities are eligible to seek authorization from IN-SPACe to establish or operate launch facilities within India. Non-Indian operators must collaborate with an Indian entity to establish or operate launch facilities in India.

- Applicants must provide detailed technical information about the proposed launch facilities and planned missions. Additionally, they must obtain all necessary licenses and approvals from other relevant ministries and agencies.

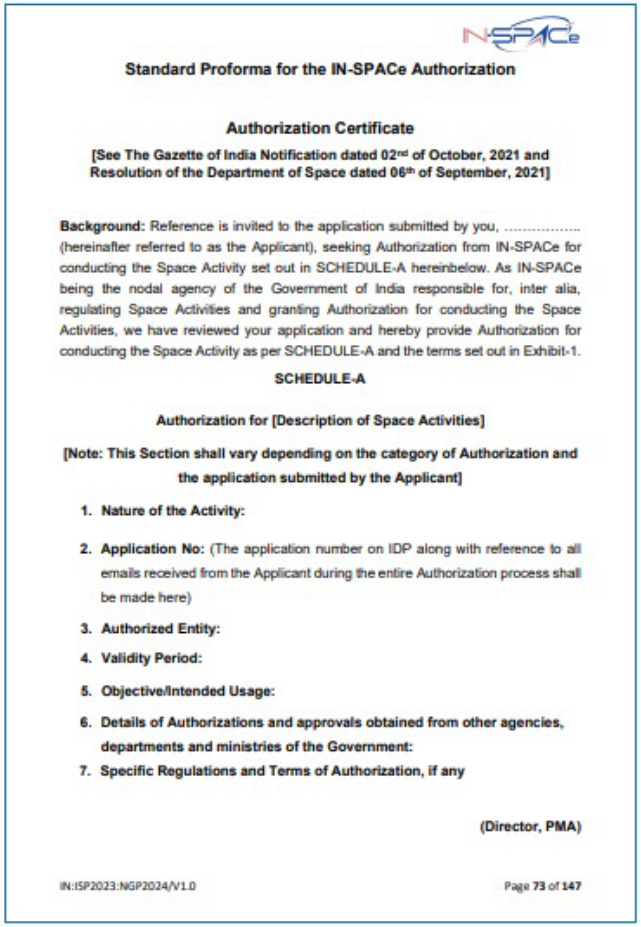
- If the launch facility is to be located outside India, approval from the foreign administration of that country is required. Any changes in the facility configuration, ownership, or other significant aspects require fresh authorization from IN-SPACe. Authorized launch facility operators can provide services to other authorized launch operators.

Liability Related Aspects

Sr. No.	Heading	Points
1	Third-Party Liability Guidelines	India is a signatory to international space treaties like the Outer Space Treaty, Liability Convention, Registration Convention, etc., which assign liability to launch states.
2	For sub-orbital/orbital launches from Indian territory	• Launch operator may be required to maintain third-party liability insurance as prescribed by IN-SPACe. • Insurance amount, period, terms & conditions to be specified by IN-SPACe. • Insurance to cover damage by launch vehicle and payloads. • Government of India to be included as an insured party. • Standard global insurance exclusions may be permitted. • For non-Indian payloads, liability is to be transferred contractually to the payload owner
3	For launches from outside India	• Liability to be addressed through agreement/contract with the host nation. • For non-Indian payloads, liability and registration responsibility are to be transferred contractually.
4	For Indian space objects launched domestically	• IN-SPACe authorization for the space object required. • Space object registration norms to be followed.
5	For Indian space objects launched by foreign vehicles	• Launch contract to make launch operator liable until separation. • Government of India to be an insured party if insurance is maintained. • Space object registration norms to be followed
6	For planned re-entries	• Third-party liability insurance may be mandated by IN-SPACe.
7	General guidelines	• Space debris mitigation guidelines to be followed • IN-SPACe may issue further third-party liability guidelines • Non-compliance or misconduct may make the applicant liable to IN-SPACe/Govt. of India.

Sample Authorisation Certificate Granted by In-SPACe

Applicants seeking to conduct space activities in India must submit their application via the IN-SPACe Digital Platform (IDP). IN-SPACe will review the credentials and capabilities of the applicant, and assess safety, security, technical criteria, RF interference, and compliance with national and international guidelines. If the application is accepted, the applicant will receive a provisional authorization to help obtain approvals from other ministries, followed by a final authorization certificate within 75-120 days.



Standard Proforma for the IN-SPACe Authorization

Authorization Certificate

[See The Gazette of India Notification dated 02nd of October, 2021 and Resolution of the Department of Space dated 06th of September, 2021]

Background: Reference is invited to the application submitted by you, ... (hereinafter referred to as the Applicant), seeking Authorization from IN-SPACe for conducting the Space Activity set out in SCHEDULE-A hereinbelow. As IN-SPACe being the nodal agency of the Government of India responsible for, inter alia, regulating Space Activities and granting Authorization for conducting the Space Activities, we have reviewed your application and hereby provide Authorization for conducting the Space Activity as per SCHEDULE-A and the terms set out in Exhibit-1.

SCHEDULE-A

Authorization for [Description of Space Activities]

[Note: This Section shall vary depending on the category of Authorization and the application submitted by the Applicant]

1. **Nature of the Activity:**
2. **Application No:** (The application number on IDP along with reference to all emails received from the Applicant during the entire Authorization process shall be made here)
3. **Authorized Entity:**
4. **Validity Period:**
5. **Objective/Intended Usage:**
6. **Details of Authorizations and approvals obtained from other agencies, departments and ministries of the Government:**
7. **Specific Regulations and Terms of Authorization, if any**

(Director, PMA)

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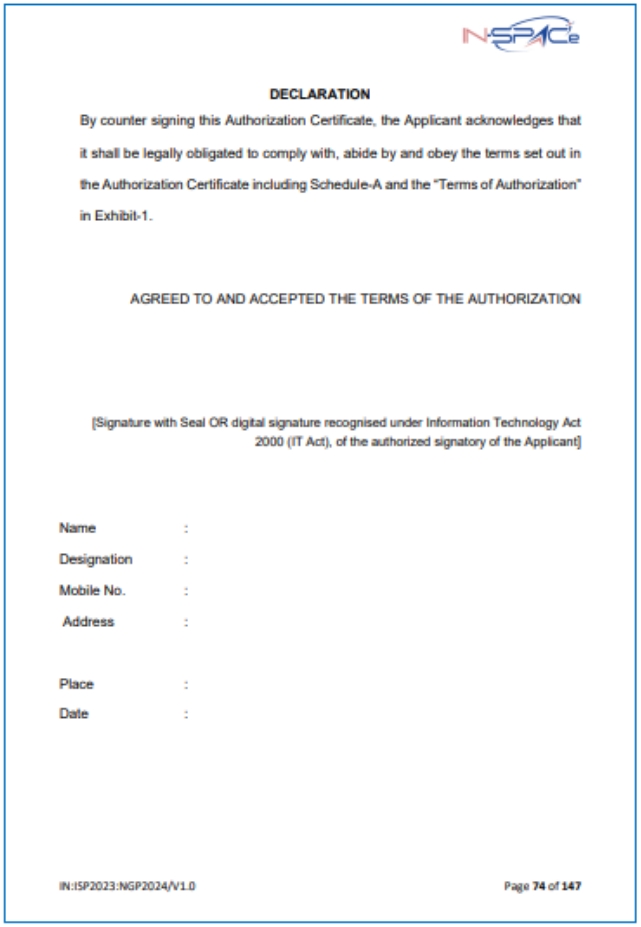


DECLARATION

By counter signing this Authorization Certificate, the Applicant acknowledges that it shall be legally obligated to comply with, abide by and obey the terms set out in the Authorization Certificate including Schedule-A and the "Terms of Authorization" in Exhibit-1.

AGREED TO AND ACCEPTED THE TERMS OF THE AUTHORIZATION

[Signature with Seal OR digital signature recognised under Information Technology Act 2000 (IT Act), of the authorized signatory of the Applicant]

Name :
Designation :
Mobile No. :
Address :

Place :
Date :

IN:ISP2023:NGP2024/V1.0 Page **74** of **147**

Organizational Structure of the Department of Space

The Space Commission, overseen by the Prime Minister's Office, plays a pivotal role in India's space program by formulating policies and overseeing the implementation of space-related initiatives. The Department of Space (DOS) is responsible for executing these programs through several key

- Indian Space Research Organisation (ISRO): As India's primary space agency, ISRO is responsible for the country's space exploration and satellite deployment, leading the charge in advancing India's space capabilities.

- IN-SPACe (Indian National Space Promotion and Authorization Center): As a regulatory body, IN-SPACe facilitates and promotes private sector participation in India's space sector, ensuring the smooth conduct of commercial space activities.

- Antrix Corporation: Serving as the commercial arm of ISRO, Antrix is responsible for marketing space products and services, including satellite launches and transponder leasing, both domestically and internationally.

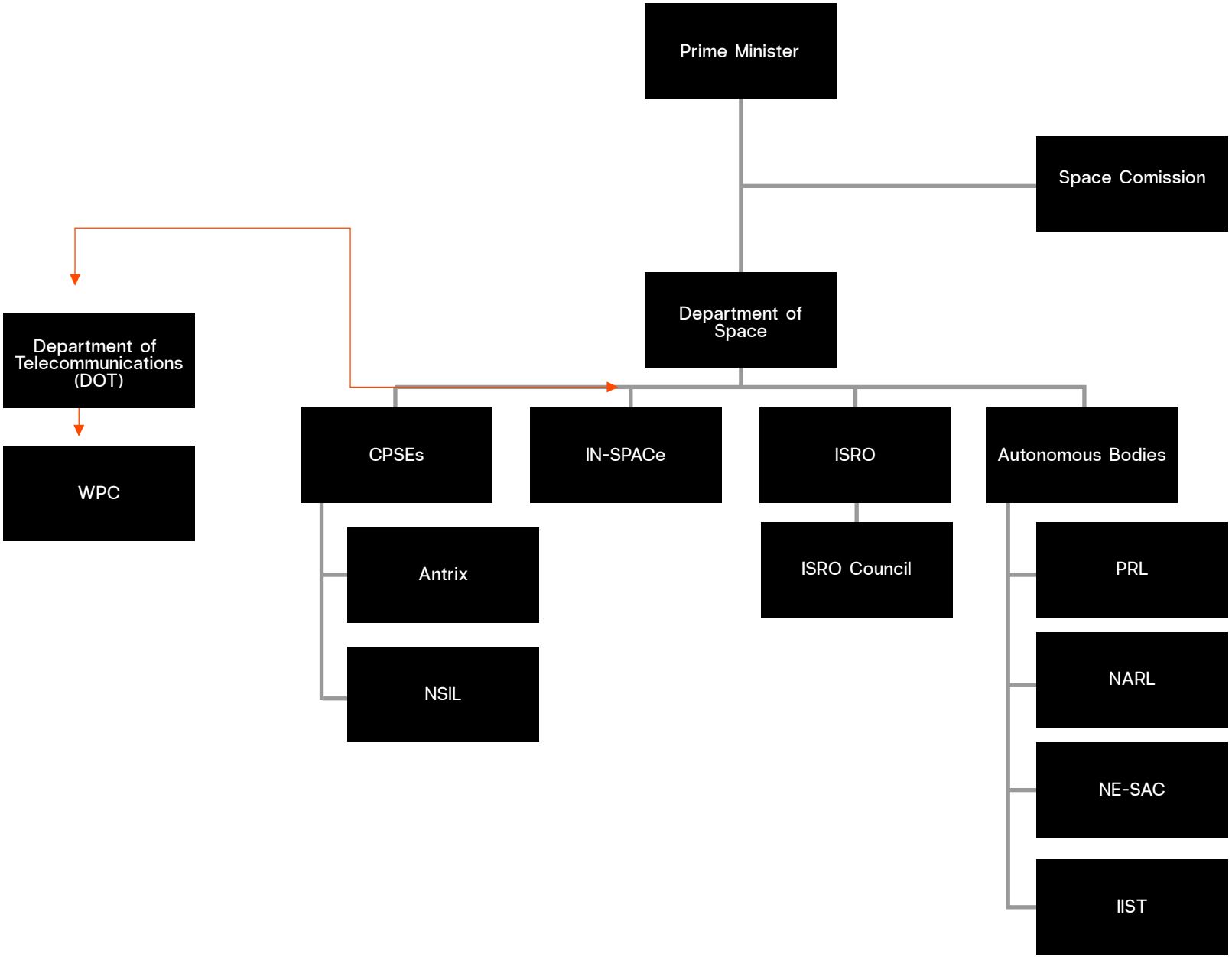
- NewSpace India Limited (NSIL): NSIL is tasked with expanding the commercialization of space products, managing satellite launches, and facilitating the transfer of ISRO-developed technologies to Indian industries, enhancing India's industrial capabilities in space technology.

- Wireless Planning and Coordination Wing (WPC), Department of Telecommunications: The WPC is responsible for the regulation, planning, and coordination of the radio frequency spectrum in India. It manages spectrum allocation of various services including mobile, satellite, broadcasting, and defence. WPC also develops policies to ensure efficient and interference-free operations and collaborates with international bodies like the International Telecommunication Union (ITU) to harmonize spectrum usage.

- Physical Research Laboratory (PRL): This institution focuses on space and atmospheric sciences, conducting advanced research in areas such as astronomy and space physics, contributing to the scientific foundation of India's space missions.

- National Atmospheric Research Laboratory (NARL): Specializing in atmospheric research, NARL studies various atmospheric phenomena and their impact on climate and weather, providing critical data for both space and environmental research.

- North Eastern-Space Applications Centre (NE-SAC): NE-SAC leverages space technology to drive socio-economic development of India's North Eastern region, utilizing remote sensing and communication technologies to address regional challenges.


Prime Minister
Space Comission
Department of Space
Department of Telecommunications (DOT)
WPC
CPSEs
IN-SPACe
ISRO
Autonomous Bodies
Antrix
NSIL
ISRO Council
PRL
NARL
NE-SAC
IIST

Industry Associations

Organization	About
CII National Committee on Space	CII National Committee on Space works towards enabling private sector participation, fostering innovation, and enhancing India's global competitiveness in the space sector.
Indian Space Association	The Indian Space Association (ISpA) is an industry association for Indian space and satellite manufacturing companies, established to provide advisory and advocacy support to the space industry in India.

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Annexures

Nodal Government Agencies

The Indian Space Research Organisation (ISRO) is the national space agency of India, founded in 1969. It operates as the primary research and development arm of the Department of Space.

In-SPACe: An autonomous single window agency constituted by the Department of Space in 2021. Its mandate is to authorise all space activities undertaken by non-government entities (NGEs). In-SPACe has issued the norms, guidelines and procedures (NGP) for implementing the Indian Space Policy, 2023. The NGP document details how private entities intending to carry out space activities in India can apply for authorization.

Space Application Centre (SAC) is an institution under the Department of Space, Government of India. SAC is dedicated to the development of payloads for communication, remote sensing, meteorology, and space science. It plays a vital role in designing and building satellite systems, payloads, and associated ground systems for various space missions.

New Space India Limited (NSIL) is a commercial arm of the Indian Space Research Organisation ISRO. It operates under the Department of Space, Government of India, and its primary mandate is to facilitate the commercialization of space products, services, and technologies developed by ISRO.

The Department of Telecommunications (DoT) is responsible for formulating policies and regulations related to the telecommunications sector. It is also tasked with overseeing the licensing and spectrum allocation for satcom services.

Private Sector Indian Space Companies

Agnikul Cosmos

- Overview: A Chennai-based startup focusing on developing small-lift launch vehicles for launching small satellites.
- Key Achievements: Development of Agnibaan, a customizable small satellite launch vehicle.

Astrogate Labs

- Overview: A company focusing on developing advanced optical communication systems for small satellites.
- Key Achievements: Development of a range of optical communication products, including smallsat optical downlink terminals

Astrome Technologies

- Overview: A company focusing on providing high bandwidth, low-cost internet using satellites.
- Key Achievements: Development of millimeter-wave technology for satellite communication.

Augsenselab Pvt Ltd

- Overview: A startup focussed on atmospheric sensing solutions, leveraging GNSS tomography and radio occultation to improve weather sensing and forecasting.
- Key Achievements: The development of the N-Sonde system, which integrates sensors with cloud-based computational frameworks for real-time atmospheric data collection and analysis.

Bellatrix Aerospace

- Overview: A private aerospace manufacturer based in Bangalore, focusing on in-space propulsion systems and orbital launch vehicles.
- Key Achievements: Development of Chetak, an eco-friendly rocket, and various propulsion systems.

Cosmicport

- Overview: A company that focuses on reusable small satellite launch vehicles and advanced satellite technologies.
- Key Achievements: Launch of the Cosmic Cruiser, a reusable small satellite launch vehicle.

Dhruva Space

- Overview: A Hyderabad-based company that provides end-to-end solutions for space-based applications.
- Key Achievements: Development of small satellite platforms and ground systems.

Digantara

- Overview: A startup focusing on space operations and traffic management, particularly on Space Situational Awareness (SSA).
- Key Achievements: Space Mission Assurance Platform (Space MAP) for enhanced space traffic monitoring and proprietary optical sensor technology for tracking resident space objects in low-earth orbit.

Elena Geo Tech

- Overview:The company focuses on the field of navigation solutions based on the Indian Regional Navigation Satellite System (NavIC).
- Key Achievements: Indigenous development of NavIC chips through sustained research and development efforts.

EtherealX

- Overview: A company specializing in satellite-based applications and data analytics.
- Key Achievements: Providing satellite data for various sectors such as agriculture, defense, and disaster management.

Galaxeye

- Overview: A startup focused on earth observation and satellite imaging technologies.
- Key Achievements: Development of advanced imaging satellites for various applications.

Kawa Space

- Overview: A company specializing in satellite-based applications and data analytics.
- Key Achievements: Providing satellite data for various sectors such as agriculture, defense, and disaster management.

Pixxel

- Overview: A space data company building a constellation of earth-imaging small satellites to provide global coverage every day.
- Key Achievements: Launch of the first private remote sensing satellite, hyperspectral imaging.

Logic Fruit

- Overview:A company specializing in FPGA-based heterogeneous systems and providing end-to-end design and development services for high-performance applications across various sectors.
- Key Achievements: Development of applications such as encryption modules, secured communication solutions, surveillance, data acquisition, image & video processing, waveform generator, avionics IP core development and integration

Manastu Space

- Overview: A company specializing in developing green satellite propulsion systems.
- Key Achievements: Created a novel propellant that is 40 times less toxic than traditional fuels, enhancing safety and operational efficiency in satellite missions.

OrbitAID Aerospace Private Limited

- Overview:A company specializing in developing innovative satellite life extension solutions.
- Key Achievements: Developing an innovative in-orbit refuelling technologies and a constellation of tanker satellites to establish a 'Fuel Station in Space'.

Pramatra Space

- Overview: A quantum technology venture building satellites to distribute quantum keys to enterprises.
- Key Achievements: Selected for the Techstars Space Accelerator 2024 and developed a compact QKD chip utilizing integrated photonics.

QBIT Labs

- Overview: A research and development company specializing in solutions for sectors such as defence, aerospace, and telecommunications.
- Key Achievements: Established partnerships with leading organizations to enhance its technological capabilities, and secured funding to expand its research initiatives.

Satsure

- Overview: A data analytics company that uses satellite imagery to provide insights across various sectors.
- Key Achievements: Solutions for agriculture, urban planning, and disaster management.

Skyroot Aerospace

- Overview: A private aerospace manufacturer and commercial launch service provider based in Hyderabad.
- Key Achievements: Development of Vikram series of rockets, successful testing of rocket engines.

Taramandal

- Overview:A startup that focuses on developing energy-efficient advanced subsystems for satellites, specifically in the area of Attitude Determination & Control Systems (ADCS)
- Key Achievements: Recognized as the Best Emerging Start-up of the Year 2023 in the space sector.

TeamIndus

- Overview: Initially known for competing in the Google Lunar XPRIZE, TeamIndus focuses on lunar missions and technologies.
- Key Achievements: Development of lunar lander and rover technologies.

Vistaarnksh Pvt Ltd

- Overview: A startup focussing on seamlessly integrating terrestrial (TN) and non-terrestrial (NTN) networks, providing continuous connectivity for everyone.
- Key Achievements: Vistaarnksh has developed innovative hybrid mesh network solutions that link devices and systems through terrestrial network protocols with SATCOM as a reliable backhaul.

XDLinx

- Overview: A startup focused on developing advanced communication systems using satellite technology.
- Key Achievements: Innovative solutions for satellite-based communication networks.

About Gateway Consulting

Gateway Consulting is a public policy research firm committed to delivering insightful and impactful analyses on a wide range of policy issues.
The firm focuses on providing evidence-based recommendations to government agencies, private sector organizations, non-profit entities and society with an aim to drive positive societal change.

About Newsky Plus

Today's vibrant space industry unlocks a new frontier of transformative opportunities, driving global progress at an unstoppable pace. Innovation, expertise, and vision are the key forces shaping the future of space exploration. At NewSky.plus, we specialize in strategic consulting for satellites, space communications, and the commercial space sector, with deep expertise in regulatory affairs, risk management, and international advocacy. We help clients navigate complex challenges in compliance, market analysis, and policy, delivering tailored, results-driven solutions
in this evolving landscape

About SIA-India

As a dynamic, not-for-profit space sector association, SIA-India is dedicated to advancing sectoral interests, accelerating industry growth, and catalysing innovation through strategic engagements with key governmental and global stakeholders, policymakers, regulatory bodies, and standardization entities, aiming to create a vibrant and innovative ecosystem.

Innovative input, impactful output.