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The space activities in India started with the setting up of Indian National Committee for Space Research (INCOSPAR) in 1962. Initial years saw the work on atmospheric studies with the establishment of Thumba Equatorial Rocket Launching Station (TERLS) near Thiruvananthapuram at southern end of the country. The Indian Space Research Organization (ISRO) established in 1969, took the space programme to altogether new level in the coming years with programmes aimed at harnessing the benefits of space technology for the national and societal development.

The Indian Space programme is characterized by a vision to use space technology for national development. The primary objective of the space programme is to establish operational space services in a self-reliant manner in the thrust areas of satellite communication, satellite-based resource survey/management, satellite navigation, satellite meteorological applications and other emerging areas and to carry out sustained research and development in these areas.

Department of Space (DOS) is the responsible for promoting the development of space science, technology, and applications towards achieving self-reliance and facilitating all-around development of the nation. DOS implements the space programmes through Indian Space Research Organization (ISRO) and other national laboratories.

ISRO is the national space agency, responsible for research and development as well as execution of projects related to space science, technology and applications. ISRO is also responsible for research and development in cutting edge technologies. To address the vast areas of the mandate, different centers and units have been created by ISRO, each specializing in specific domains of space activities like launch vehicles, satellites, payloads, applications, launchpad, ground segment, etc.

NewSpace India Limited (NSIL), a wholly owned Government of India company, under the administrative control of Department of Space (DOS) is the commercial arm of Indian Space Research Organisation (ISRO) with the primary responsibility of enabling Indian industries to take up high technology space related activities and is also responsible for promotion and commercial exploitation of the products and services

emanating from the Indian space programme. Subsequent to space reforms of 2020, the role and scope of NSIL has been enhanced in addition to the primary business areas to include owning satellites for earth observation and communication, and providing satellite services, building satellites and launch vehicles and providing launch services.

The space sector has been opened up for private participation subsequent to the space reforms announced by the Government of India in 2020. Indian National Space Promotion and Authorization Center (IN-SPACe) is the independent nodal agency under DOS to permit and oversee the activities of private entities in the country.

Indian satellites

Indian Remote Sensing satellite fleet consisting of optical remote sensing satellites, radar imaging satellites, oceanographic satellites and hyper spectral imaging satellites that provide imaging data for various applications like cartography, land information system, geographical information system, disaster management support, monitoring of cyclones, oceanographic studies, coastal dynamics studies, glacial studies, agricultural support, desertification and land degradation, etc. INSAT series of satellites with meteorological payloads operating from geostationary orbit support weather forecasting services and along with satellites in Low Earth Orbit, support the satellite based search and rescue programmes.

The fleet of communication and high throughput satellites of GSAT series support services like television broadcasting, DTH television, telecommunication, VSATs, radio networking and societal applications.

NavIC (NAVigation with Indian Constellation) is the Indian Regional Navigation Satellite System providing positioning, navigation and timing services for the country, supporting various applications in transportation, location based services, personal mobility, resource monitoring, surveying and safety-of-life alert dissemination.

Indian Space Transportation System

The operational launch vehicles of ISRO – PSLV (Polar Satellite Launch Vehicle), GSLV (Geosynchronous Satellite Launch Vehicle) and GSLV Mk-III provide assured access to space for launching satellites for earth observation, communication, navigation and space exploration. SSLV, a dedicated small launcher for catering to global shift towards small satellites is under development.

ISRO's two launchpads at the spaceport of Sriharikota near Chennai, provide space launch capability for the country.

Space science and exploration missions

The Indian space science exploration programme is engaged in developments for its future space science mission like the next mission to Moon Chandrayaan-3, solar exploration mission Aditya-L1, space observatory XpoSat, etc. The current missions in operation AstroSat – India’s first dedicated astronomical observatory and Chandrayaan-2 orbiter continue to provide valuable scientific data.

Gaganyaan – Indian Human Spaceflight programme

The Gaganyaan programme aims at accomplishing human spaceflight capability by undertaking a mission to carry humans to Low Earth Orbit and return them safely back to earth, using an Indian Orbital Module and Indian human-rated launch vehicle. Two unmanned flights are planned before the manned flight. Critical technologies needed to undertake the human spaceflight like crew module, crew escape system and environmental control and life support system are under development.



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