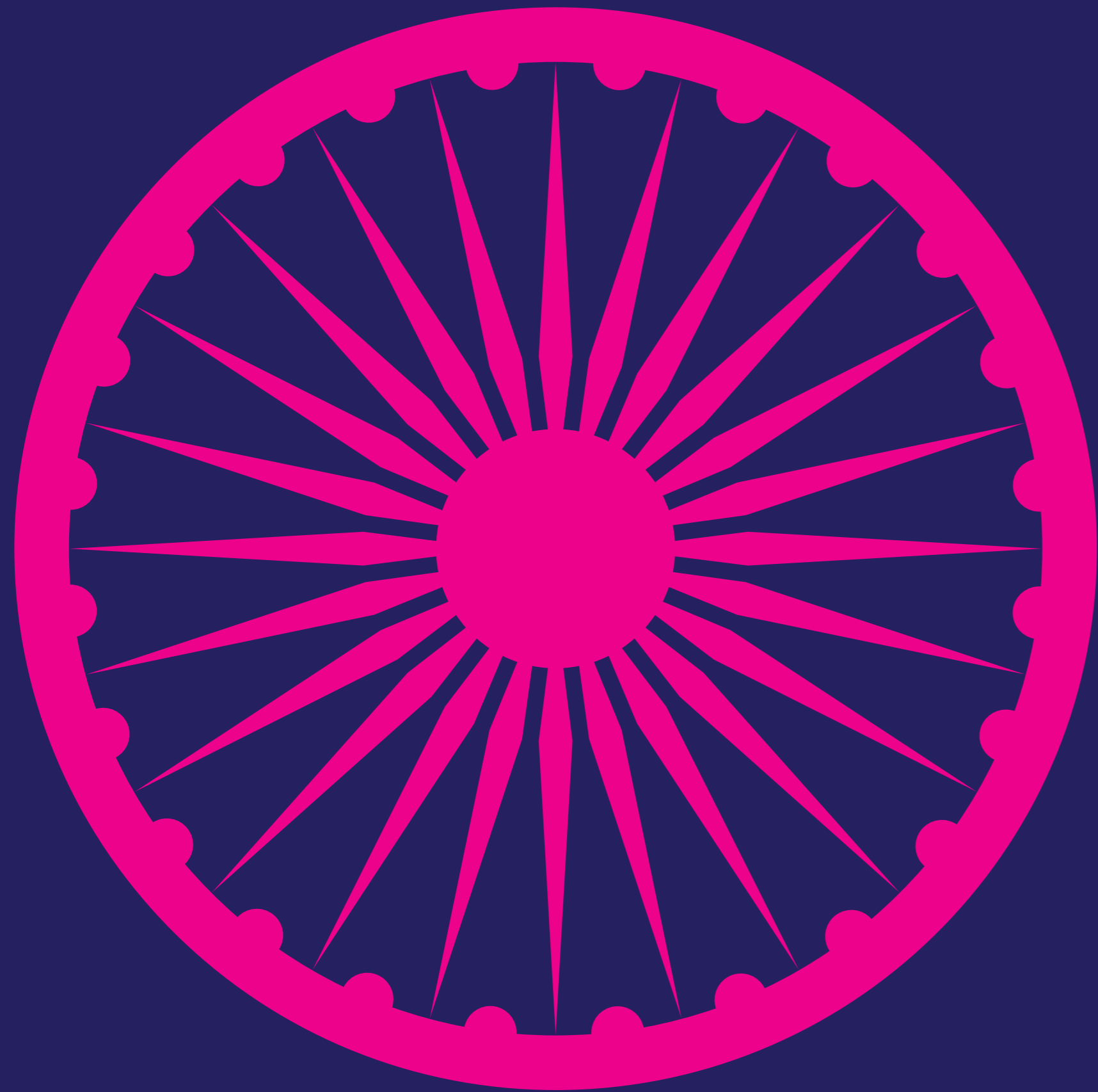


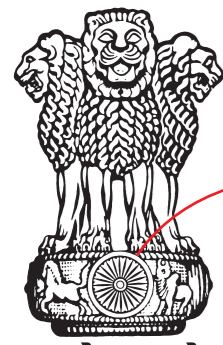


**MAKE IN
INDIA**

SPACE



**FROM AGRICULTURE TO AUTOMOBILES
FROM HARDWARE TO SOFTWARE
FROM SATELLITES TO SUBMARINES
FROM TELEVISIONS TO MOVIES
FROM BRIDGES TO BIOTECHNOLOGY
FROM PAPER CLIPS TO POWER PLANTS
FROM ROADS TO CITIES
FROM FRIENDSHIP TO PARTNERSHIP
FROM PROFIT TO PROGRESS
WHATEVER YOU WANT TO MAKE:
MAKE IN INDIA**



सत्यमेव जयते

The Ashoka Chakra is a central element in India's national emblem and also forms the centrepiece of India's national flag. The wheel denotes peaceful progress and dynamism – a sign from India's enlightened past, pointing the way to a vibrant future.

Since time immemorial, the Lion has been the official emblem of India. It stands for strength, courage, tenacity and wisdom – values that are every bit as Indian today as they have ever been.



STAR PLAYER

STELLAR ACHIEVEMENTS AT DOWN-TO-EARTH COSTS – INDIA'S SPACE PROGRAM HAS LAUNCHED 40 SATELLITES FOR 19 COUNTRIES AND COUNTING.

INDIA'S SPACE PROGRAMME STANDS OUT AS ONE OF THE MOST COST-EFFECTIVE IN THE WORLD.

33 COUNTRIES AND 3 MULTINATIONAL BODIES HAVE FORMAL CO-OPERATIVE ARRANGEMENTS IN PLACE WITH THE INDIAN SPACE RESEARCH ORGANIZATION.

30 SPACECRAFT IN DIFFERING ORBITAL PATHS.

NEW INITIATIVES

THE MAKE IN INDIA PROGRAM INCLUDES MAJOR NEW INITIATIVES DESIGNED TO FACILITATE INVESTMENT, FOSTER INNOVATION, PROTECT INTELLECTUAL PROPERTY AND BUILD BEST-IN-CLASS MANUFACTURING INFRASTRUCTURE.

1 NEW PROCESSES

- SPECIAL FOCUS ON EASE OF DOING BUSINESS
- DE-LICENSING & DEREGULATION

2 NEW INFRASTRUCTURE

- INDUSTRIAL CORRIDORS
- INDUSTRIAL CLUSTERS
- SMART CITIES
- NURTURING INNOVATION
- SKILL DEVELOPMENT

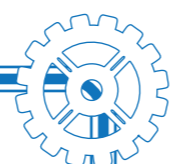
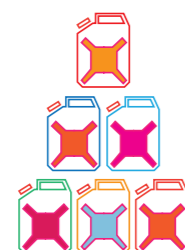
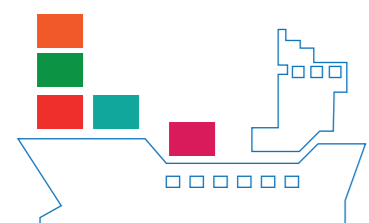
3 NEW SECTORS

- OPENING OF CRITICAL SECTORS LIKE DEFENSE, CONSTRUCTION AND RAILWAYS FOR FDI

4 NEW MINDSET

- DEDICATED TEAMS THAT WILL GUIDE AND ASSIST FIRST-TIME INVESTORS FROM TIME OF ARRIVAL
- FOCUSED TARGETTING OF COMPANIES ACROSS SECTORS

FACTS + FIGURES



REASONS TO INVEST

- Through the last four decades, India's space program has attracted global attention for its accelerated rate of development.
- India's cost-effective space program has launched 40 satellites for 19 countries to date and has the potential to serve as the world's launchpad.
- The Indian Space Research Organization (ISRO) has forged a strong relationship with a large number of industrial enterprises, both in the public and private sector, to implement its space projects.
- With the ISRO undertaking the development of cutting edge technologies and interplanetary exploratory missions, there is a tremendous scope in contributions to the realization of operational missions and new areas such as satellite navigation.

TECHNOLOGY TRANSFER:

- The technologies licensed to industries for commercialisation include Multi-Layer Printed Antenna Technology and DDV 100 Resin system.

In addition to this, industries have been shortlisted for the know-how transfer of Dual Polarization LIDAR, Solid State Power Amplifier, Precision Tapping Attachment and EPY 1061 coating compound. There are a number of technologies identified for know-how transfer from ISRO. These include various types of adhesives and polymers, silica fiber and granule material, ceramics, pressure transducers, liquid level detectors, temperature sensors, silver plating and thermal control coating techniques, ground penetration radar, elastic Raman Lidar, lower atmospheric wind profiling radar, etc.

TECHNICAL CONSULTANCY:

- ISRO provides technical consultancy services to industries and R&D institutions in diverse areas of its expertise. Some of recent areas where consulting services have been provided are: gold plating application on MMIC-based Ku-band receiver and on aluminum boxes, fabrication of precision components, mechanical shock tests, etc., to name a few.

STATISTICS

- Space activities in the country were initiated with the setting up of the Indian National Committee for Space Research (INCOSPAR) in 1962.
- The Indian Space Research Organisation (ISRO) was established in August 1969.
- The Government of India constituted the Space Commission and established the Department of Space (DOS) in June 1972 and brought ISRO under DOS in September 1972.
- PSLV, in its twenty-first flight (PSLV-C19), launched India's first radar imaging Satellite (RISAT-1) from Sriharikota on April 26, 2012 of which one orbited India's Radar Imaging Satellite (RISAT-1) and the other a French Remote Sensing Satellite SPOT-6 and the Japanese satellite PROITERES.

- In its twenty-second flight (PSLV-C21), PSLV successfully launched the French earth observation satellite SPOT-6, along with Japanese micro-satellite PROITERES from Sriharikota on September 09, 2012.
- India's heaviest communication satellite, GSAT-10, was successfully launched by Ariane-5 VA 209 from Kourou, French Guiana on September 29, 2012.
- PSLV, in its twenty-third flight (PSLV-C20), successfully launched Indo-French Satellite SARAL along with six smaller foreign satellites from Sriharikota on February 25, 2013.
- ISRO currently has a constellation of 9 communication satellites, 1 meteorological satellite, 10 earth observation satellites and 1 scientific satellite.

GROWTH DRIVERS

THE INDIAN SPACE RESEARCH ORGANISATION (ISRO):

- The prime objective of ISRO is to develop space technology and its application to various national tasks.

SPACE COMMERCE:

- Antrix Corporation Limited, the commercial arm of the Department of Space has undertaken a number of initiatives for the global marketing of space products and services. Antrix has continued to expand its market base.
- There has been good progress in the provision of TTC support to international customers.

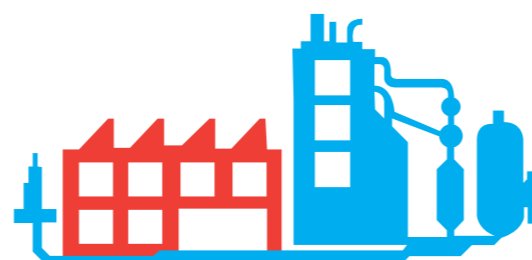
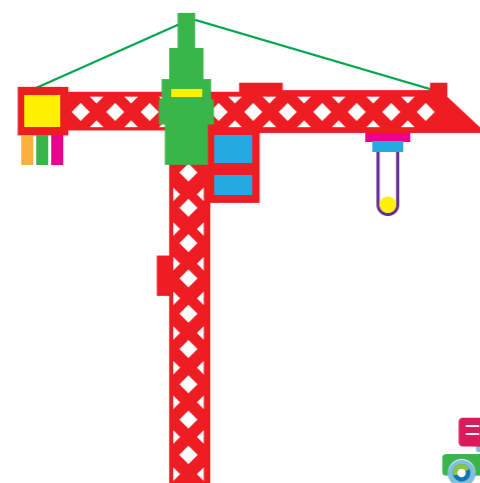
LAUNCH VEHICLES:

- Satellite Launch Vehicle (SLV): Its first launch took place in 1979 with two more in each subsequent year, and the final launch took place in 1982.
- Augmented Satellite Launch Vehicle (ASLV): The first launch test was held in 1987, and three others followed in 1988, 1992 and 1994.
- Polar Satellite Launch Vehicle (PSLV): PSLV is capable of launching Remote Sensing (IRS) satellites into sun-synchronous orbits. PSLV can also launch small satellites into geo-stationary transfer orbit (GTO). The reliability and versatility of the PSLV is proven by the fact that it has launched 30 spacecraft (14 Indian and 16 from other countries) into a variety of orbital paths so far.

- Geosynchronous Satellite Launch Vehicle (GSLV): The Geosynchronous Satellite Launch Vehicle, known by its abbreviation GSLV, is an expendable launch system developed to enable India to launch its INSAT-type satellites into geostationary orbit and to make India less dependent on foreign rockets. At present, it is ISRO's heaviest satellite launch vehicle and is capable of putting a total payload of up to five tons to Low Earth Orbit.

SPACE SCIENCE PROGRAMME:

- Space science research activities are pursued at the Physical Research Laboratory (PRL), the Space Physics Laboratory (SPL), the National Atmospheric Research Laboratory (NARL) and the Special Advisory Group (SAG) at the Indian Space Research Organization Satellite Center (ISAC). A number of space science research projects in the field of atmospheric science, astronomy and planetary exploration and science payload development activities are supported and implemented at various universities and research institutes by ISRO through the recommendations of ISRO's Advisory Committee for Space Sciences (ADCOS).
- Mars Orbiter Mission is ISRO's first interplanetary mission to Mars with a spacecraft designed to orbit Mars in an elliptical orbit of 372 kms by 80,000 kms. The primary driving technological objective of the mission is to design and realise a spacecraft with a capability to reach Mars (Martian Transfer Trajectory), then to orbit around Mars (Mars Orbit Insertion) over a period of nine months.





INTERNATIONAL COOPERATION

→ Formal co-operative arrangements are currently in place with space agencies of 33 countries and 3 multinational bodies, namely, Argentina, Australia, Brazil, Brunei Darussalam, Bulgaria, Canada, Chile, Egypt, European Centre for Medium Range Weather Forecasts (ECMWF), European Organisation for Exploitation of Meteorological Satellites (EUMETSAT), European Space Agency (ESA), France, Germany, Hungary, Indonesia, Israel, Italy, Japan, Kazakhstan, Mauritius, Mongolia, Myanmar, Norway, Peru, Republic of Korea, Russia, Saudi Arabia, Spain, Sweden, Syria, Thailand, the Netherlands, Ukraine, the United Kingdom, the United States of America and Venezuela.

→ The areas of co-operation address mainly remote sensing of the earth, satellite communication, launch services, telemetry and tracking support, space exploration, space law and capacity building.

→ Co-operative instruments signed during last year are:

1. An implementation arrangement between ISRO and the National Oceanic and Atmospheric Administration (NOAA) of USA for collaboration of OCEANSAT-2 activities.
2. Implementing arrangement between ISRO and the National Aeronautics and Space Administration (NASA) of USA for the collaboration of OCEANSAT-2 activities.
3. Implementing arrangements between ISRO and NASA for co-operation on Global Precipitation Measurement and Megha-Tropiques.
4. Memorandum of Understanding between India and Australia concerning co-operation in Civil Space Science, Technology and Education.
5. Cooperation Agreement among ISRO, CNES and EUMETSAT concerning the use of Near Real-Time Megha-Tropiques data.

→ ISRO and the French National Space Agency (CNES) have worked in synergy to make available data products from Indo-French Megha-Tropiques satellite to the global scientific community for validation activities.

→ India-USA space cooperation made significant progress during last year and several follow-up actions of the third meeting of India-USA Joint Working Group on Civil Space Cooperation held at Bangalore in July 2011 were actively pursued.

→ The wind products derived from OCEANSAT-2 Scatterometer are disseminated globally since October 2012 for operational global applications through an arrangement with EUMETSAT.

→ The processed data from meteorological satellites of other nations are made available by EUMETSAT to Indian scientific community through a system called 'EUMETCast'.

→ ISRO and the Canadian Space Agency (CSA) are working on the development of the Ultraviolet Imaging Telescope (UVIT) planned on ISRO's multi wavelength astronomy satellite ASTROSAT.

→ ISRO continues to share its facilities, expertise and services in the application of space technology through hosting of United Nations (UN) affiliated Centre for Space Science and Technology Education in Asia and the Pacific (CSSTE-AP). As of now, there are more than 1100 beneficiaries from 52 countries.

→ ISRO, on behalf of India, continues to play an active role in the deliberation of the United Nations Committee on Peaceful Uses of Outer Space (UN-COPUOS).




FDI POLICY

FDI up to 74% is allowed in satellites- establishment and operation, subject to the sectoral guidelines of the Department of Space/ISRO, under the government route.



SECTOR POLICY

SATELLITE COMMUNICATION POLICY:

- A policy framework for Satellite Communication in India (approved by Government in 1997).
 - The norms, guidelines and procedures for implementation of the Policy Framework for Satellite Communications in India, approved by the government in the Year 2000.
 - INSAT Co-ordination Committee
 - Remote Sensing Data Policy 2011
- 



PROJECTS

→ GSLV III: It is designed to launch heavier communication satellites weighing 4500 to 5000 kg, it would also enhance the capability of the country to be a competitive player. GSLV is designed to put satellites to geosynchronous transfer orbit, an intermediate orbit to which satellites ultimately destined for geostationary are normally taken by launchers.

→ Chandrayaan II: India second moon mission, Chandrayaan II, set to be launched in 2016-17, will have a soft land over a wheeled robotic vehicle to explore the landing area.

→ Manned mission to Space

→ Mars Orbiter Mission

→ PSLV: The PSLV is capable of launching 1600 kg satellites in 620 km sun-synchronous polar orbit and 1050 kg satellite in geo-synchronous transfer orbit.

THE 5 FOREIGN SATELLITES:

SPOT-7

→ Country: France

→ Mass: 714 kilograms

→ Objective: Earth Observation satellite, similar to SPOT-6. Will form part of the existing earth observation constellation.

NLS.1 & NLS7.2:

→ Country: Canada

→ Mass: 15 kilograms

→ Objective: Experiments on formation flying of two satellites which are very near to each other in orbit, using GPS.

VELOX-1:

→ Country: Singapore

→ Mass: 7 kilograms

→ Objective: Experiments technology demonstration of satellite-based cameras and associated systems.

AISAT:

→ Country: Germany

→ Mass: 14 kilograms

→ Objective: A global sea-traffic monitoring system.

AGENCIES

Department of Space (<http://dos.gov.in>)

Indian Space Research Organization (<http://isro.org>)

Antrix Corporation Limited (<http://antrix.gov.in>)



सत्यमेव जयते

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