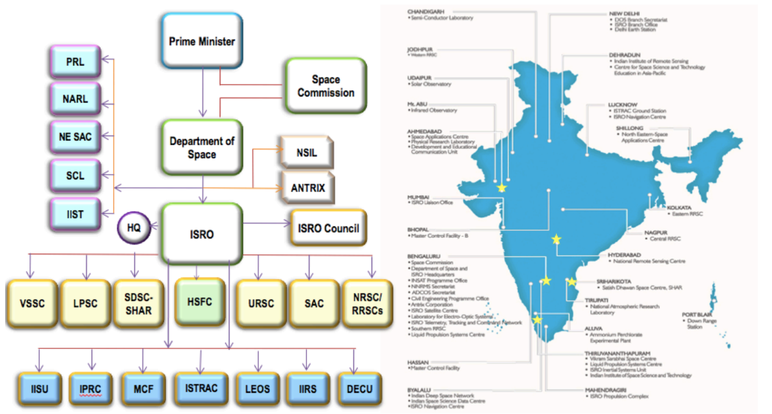
HIGHLIGHTS OF ISRO's ACHVIEMENTS AND SOCIETAL BENEFITS

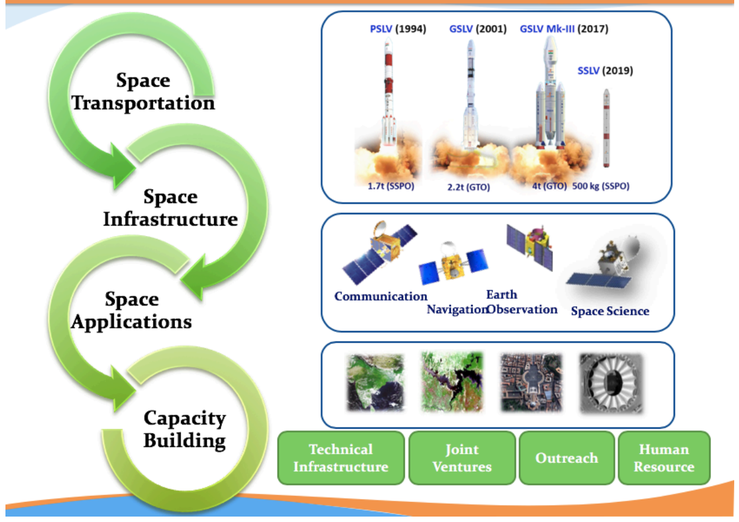
WORLD SPACE FORUM, NOVEMBER 2019, VIENNA

ISRO: Organisation Structure

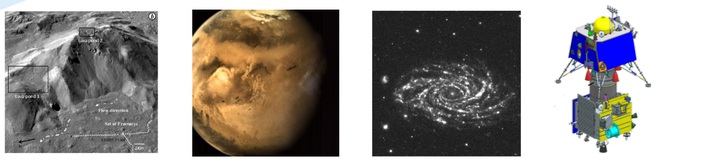


Accomplishments in Space: 184 missions

Indian Space Programme: Verticals



Space Science Missions



Chandrayaan-1	Mars Orbiter Mission	AstroSat	Chandrayaan-2
Oct, 2008- Aug, 2009	Nov, 2013 - Ongoing	Sep 2015 - Ongoing	2019
160+ publications	20+ publications	70+ publications	To investigate atmosphere, terrain, and mineralogy
620+ Global users	2100+ Global users	390+ International proposals completed	
Evidence of recent volcanism in Tycho crater	Found excess of Oxygen dominating CO_2 in Evening exosphere	Crab Pulsar Polarization in OFF pulse state	
Water molecules of endogenic origin found- in addition to polar and exosphere	Presence of Hot Argon in the Martian Exosphere	Inputs to locate gravitational wave event's origin	

UNNATI

UNispace Nanosatellite Assembly & Training by ISRO

India's Contribution to UNISPACE+50

In the 50th anniversary of UNISPACE at Vienna on June 18, 2018 **India** announced

- Capacity building training programme, **UNNATI** (UNispace Nanosatellite Assembly & Training by ISRO)
- More than 45 countries to be trained in 3 batches

UNNATI – Batch 1

30 participants from 17 countries were trained during January 15 to March 15, 2019

UNNATI – Batch 2

30 participants from 16 countries

Started on Oct 15, 2019

Enabling platform to make Nano satellites

UNNATI

Outreach activities

- **UNNATI**: 29 officials from 17 countries were trained on Nanosatellite building
- **CSSTEAP & IIRS**: 2800 officials from 109 countries benefitted on space technology applications
- More than 225 agreements with **53 countries** and 5 multi lateral bodies
- **YUVIKA**: creating awareness on space technology among middle school students
- **NAVIC:** Messaging and alert system for fishermen community; Power Grid Synchronization; Fleet & Logistics Management; Geo-fencing; Search & Rescue

Enhanced interaction with Ministries
Promoting Space Technology Applications in Governance & Development

Prime Minister of India urged Department of Space to pro-actively engage with all stakeholders to maximize the use of space science in governance and development.

National Meet deliberated on joint action plans on promoting space technology applications

22 Thematic Expert Groups formed for One-to-One Interactions with Ministries

- Joint Action Plan
- Proof of concepts
- Development of tools
- Capacity building
- Transfer of technology
- Space technology cells

160 Space Applications across **58** Ministries / Departments

Pre-National Meet

20 Ministries

- **160** Proposals
- Web & Mobile Apps : 200+
- MoUs : 130+
- Capacity Building : 11,000+
- New Space Cells : 10

Post - National Meet

58 Ministries

Agriculture, Water Resource, Forest, Environment, Urban & Rural Development, Rail & Road, Weather, Health, Education, Disaster management .....

ISRO's Application of Space based technology

Indian Space Programme: Dimensions

Vision: Harness space technology for national development, while pursuing space science research and planetary exploration

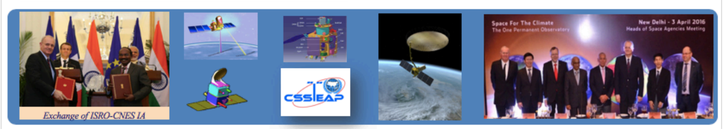
When India celebrates 75th year of Independence in 2022, an Indian Son or daughter will undertake a manned space mission onboard 'Gaganyaan' carrying the national flag.....

ISRO's International Space Cooperation- Domains & Spread

- **Realisation of joint satellite missions** *(MEGHA-TROPIQUES, SARAL)*
- **Accommodation of payloads** *(CHANDRAYAAN-1, OCEANSAT-2 & ASTROSAT)*
- **Ground station for TTC** *(Brunei, Indonesa & Mauritius)*
- **Data sharing** *(Brazil, Europe/EUMETSAT, USA)*
- **Disaster management** *(International Charter, Sentinel Asia, UNSPIDER, Search & Rescue)*
- **Capacity building** *(CSSTEAP)*
- **Participation in Advisory Committees on Policy Regulations** *(UNCOPUOS, IADC, SFCG, CGMS, CEOS, GEO, ICG, ISECG)*

More than 225 Agreements with 51 countries & 5 multinational bodies

Areas: Earth Observation, Satellite Communication, SatNav, TTC, exploration, space law & capacity building



Indian Space Programme: Road Ahead..

ISRO has well laid plan for future activities in moving towards

- **Reducing the cost of access to space**
- **Augmenting our constellation of EO** (high resolution; hyperspectral, TIR, L&S SAR, Geo-imaging), **Communication** (DTH, HTS, Optical communication, Agile, Global coverage) **and Navigation** (Enhanced and Global constellation) **Satellites**
- **Building capabilities to explore universe** (Aditya L1; XpoSAT, Venus & follow-ons)
- **Pursuing India's Human space programme - GAGANYAAN**
- **Sustaining the vibrant application programme to touch everybody's, everyday's life**

and for

- **Sharing capabilities through international relations**