

Indian Space programme: 2020 Updates & Priorities



**Presentation by Indian delegation
to
58th session of STSC - UNCOPUOS
Vienna, Austria**

April 20, 2021

SIX DECADES OF INDIAN SPACE PROGRAMME

Application Driven, Self-reliant, Focus on National Development

80 Launch vehicle missions

111 Satellites Realized

Launched
342 Satellites from
34 countries

53 Satellites in Orbit
Catering to National Requirements



Missions Accomplished (March 2020 – March 2021)



3 PSLV Missions (C49, C50, C51)
2 in DL and 1 in XL configuration



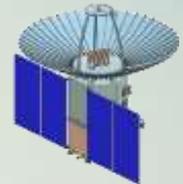
SDSAT



UNITYsat (3)



CMS-01



EOS-01

1 Earth observation satellites
1 Communication satellite
4 student satellites
23 foreign satellites

PSLV-C49 / EOS-01 & PSLV-C50 CMS-01 Missions

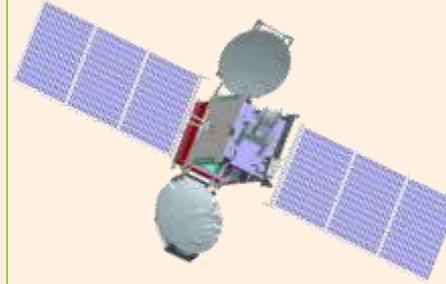


EOS -01
Earth
Observation
satellite



PSLV-C49
2nd Flight
PSLV-DL

07 November 2020



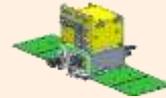
CMS-01
Communication
satellite



PSLV-C50
22nd Flight
PSLV-XL

17 Dec 2020

PSLV-C51 / Amazonia-1 Mission



SDSAT



UNITYsat (3)

PSLV-C51 : 3rd Flight in PSLV-DL Configuration

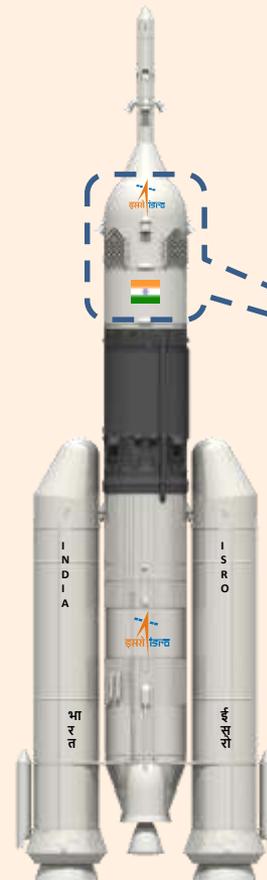
A commercial mission for launching Amazonia-1 satellite from Brazil and 14 Co-Passenger satellites.

Also 4 Indian student satellites were put in orbit

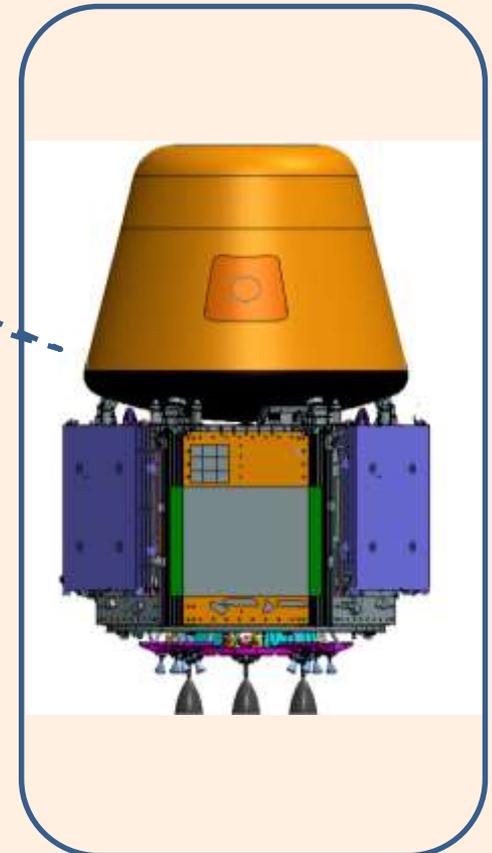
28 February 2021

Indian Human Space Flight Program – Gaganyaan Status

- Design of all systems completed and realization in progress. Development tests initiated
- **First Unmanned Flight is scheduled in December, 2021**
- Prior to Unmanned flight, inflight Crew escape system development test and Air drop test to qualify Parachutes are planned
- **Astronaut candidates returned after successful completion of Generic training in Russia. Gaganyaan specific training to commence in May in Bengaluru.**
- **Microgravity payloads are under realization**



Human Rated Launch Vehicle



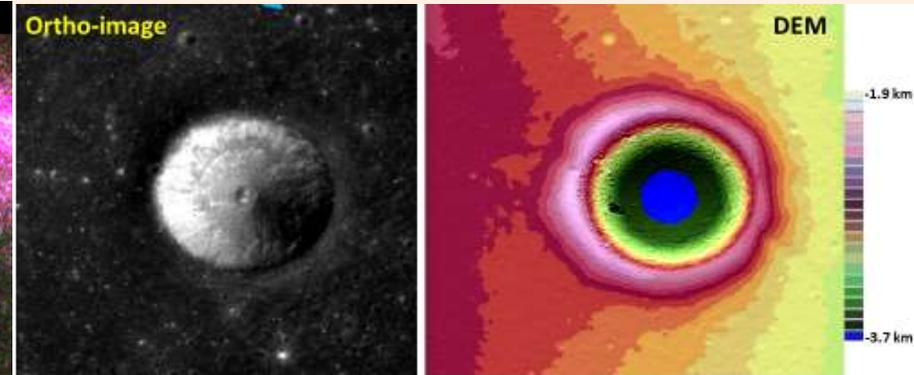
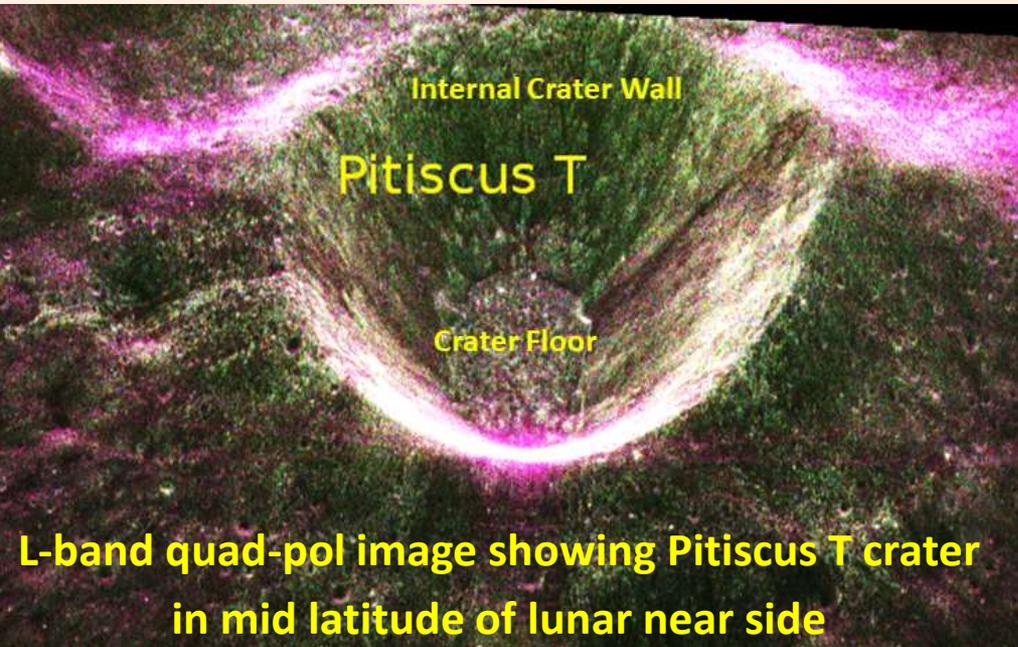
Orbital Module

Demonstration of free-space Quantum Key Distribution



- Milestone achievement for unconditionally secured satellite data communication using quantum technologies.
- The free-space QKD was demonstrated between two line-of-sight buildings at a distance of 300 m.
- Major breakthrough towards ISRO's goal of demonstrating Satellite Based Quantum Communication

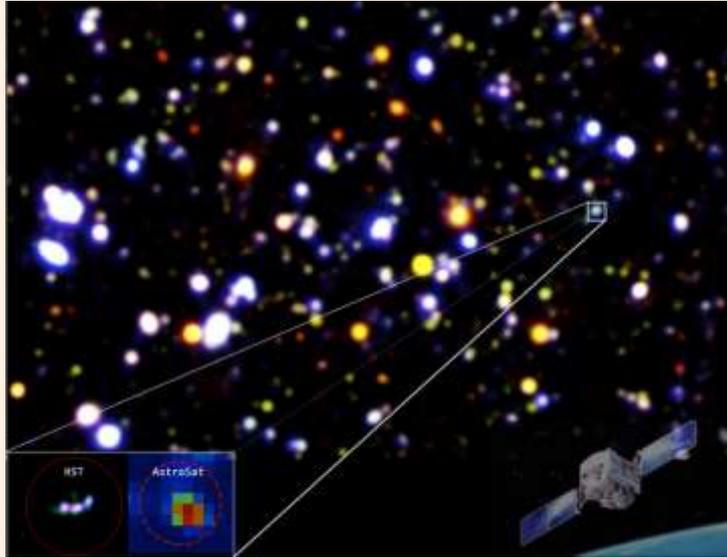
Chandrayaan-2 Data Released



Sarabhai Crater in the North East Quadrant of the Moon by TMC-2 (July 30, 2020)

- Chandrayaan-2 Orbiter was injected into lunar orbit on 2nd Sept 2019
- All the 8 payloads are working fine
- The first set of data from this mission is released for all users in the Planetary Data System 4 (PDS4) format.
- <https://www.isdc.gov.in/>

ASTROSAT discovers Earliest Galaxies & MOM images Phobos



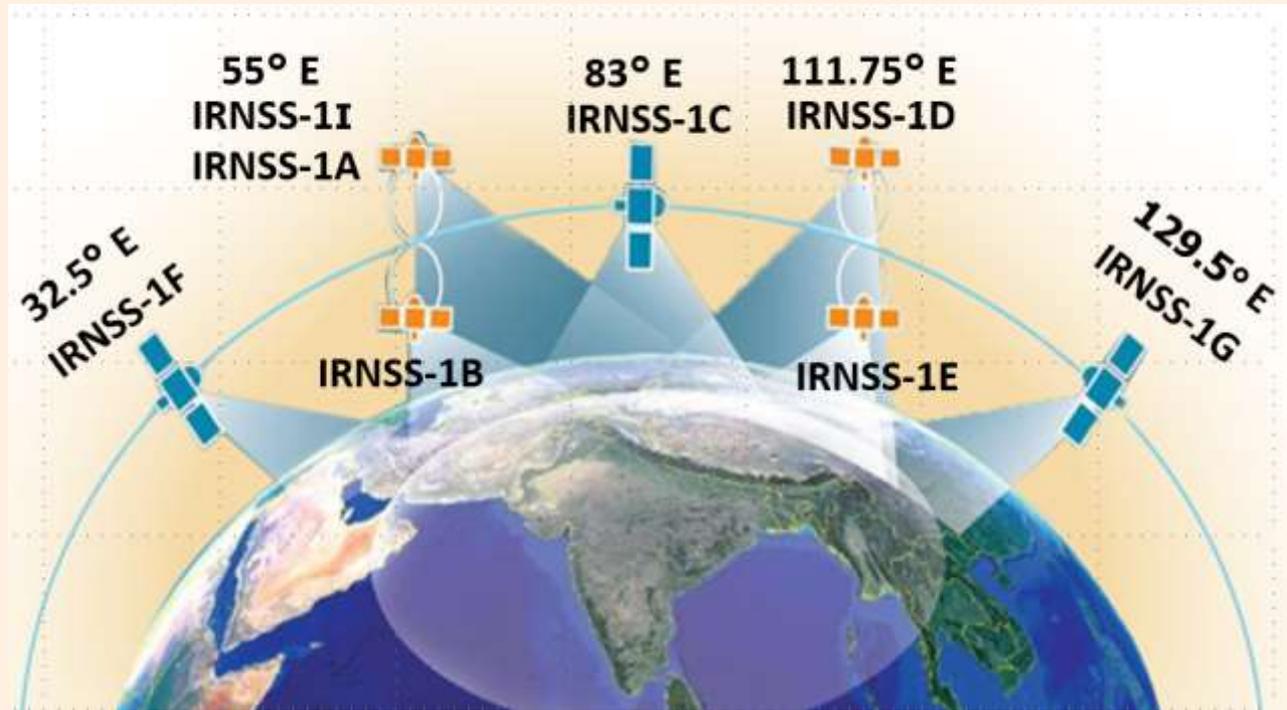
Astrosat, detected extreme-UV light from a galaxy, AUDFs01, 9.3 billion light-years away from Earth, with its 5 unique X-ray and UV telescopes working in tandem.

Discovery by international team of astronomers (India, Switzerland, France, The USA, Japan & The Netherlands) led by IUCAA & reported in *Nature Astronomy*.



Mars Colour Camera (MCC) onboard Mars Orbiter Mission has imaged Phobos, the closest and biggest moon of Mars, on 1st July, 2020 at 210 m resolution – shows Stickney (the largest on Phobos) and other craters

IMO Recognition for NavIC



- International Maritime Organisation (IMO) recognized NavIC as a component of the World-Wide Radio Navigation System (WWRNS) in Nov 2020.
- NavIC meets the operational requirements to assist in navigation of ships in ocean waters within the area covered by 55° E longitude, 50° N latitude, 110° E longitude and 5° S latitude.



*Government of India has approved **Space Sector Reforms***

Enables

Private entities to carry out end-to-end space activities

Addresses

- Regulation & Authorisation
- Infrastructure Sharing
- Hand Holding
- Promotion

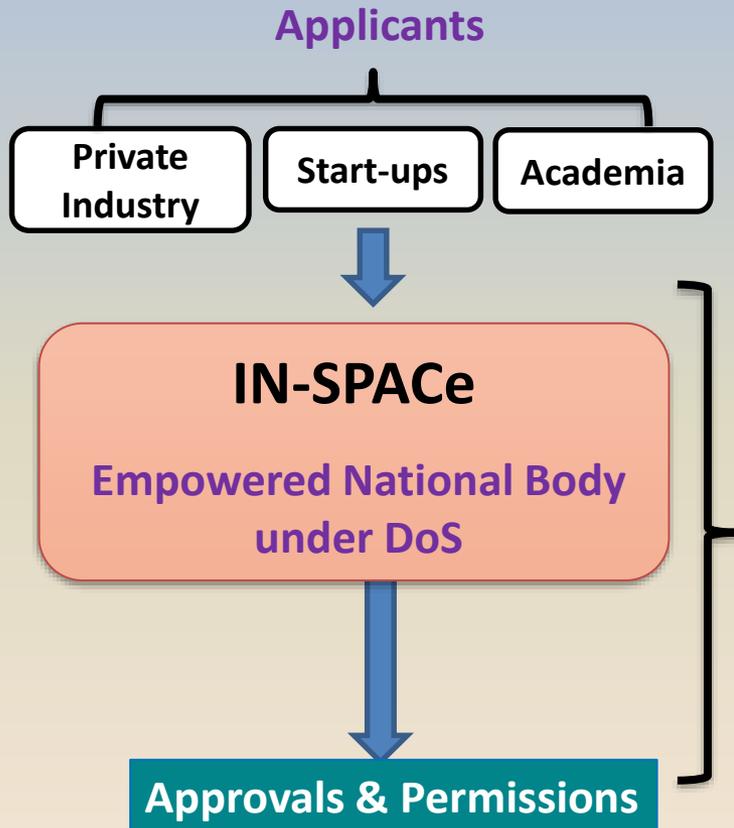
Mechanism

In-SPACEe
Autonomous Body
under DOS
Members (DOS, Ministries,
Industry & Academia)

• **NewSpace India Ltd (CPSE):** End-to-end demand based services, Commercial Production, Technology Transfer

• **ISRO:** Advanced space technologies and programmes, Capacity building

Independent Mechanism for Private Space Activities



- ✓ Promotion and handholding of industries
- ✓ Building of launch vehicle & satellites
- ✓ Sharing of ISRO facilities
- ✓ Establishment of facilities in DOS premises
- ✓ Launch campaign and launch
- ✓ Space based services

IN-SPACe being established

Interim IN-SPACe mechanism is functional

Policy and Legal Framework for Space Activities

An enabling Policy and Legal Framework is being created



Space Activities Bill



National Space Policy



Satellite Communication Policy (Revised)



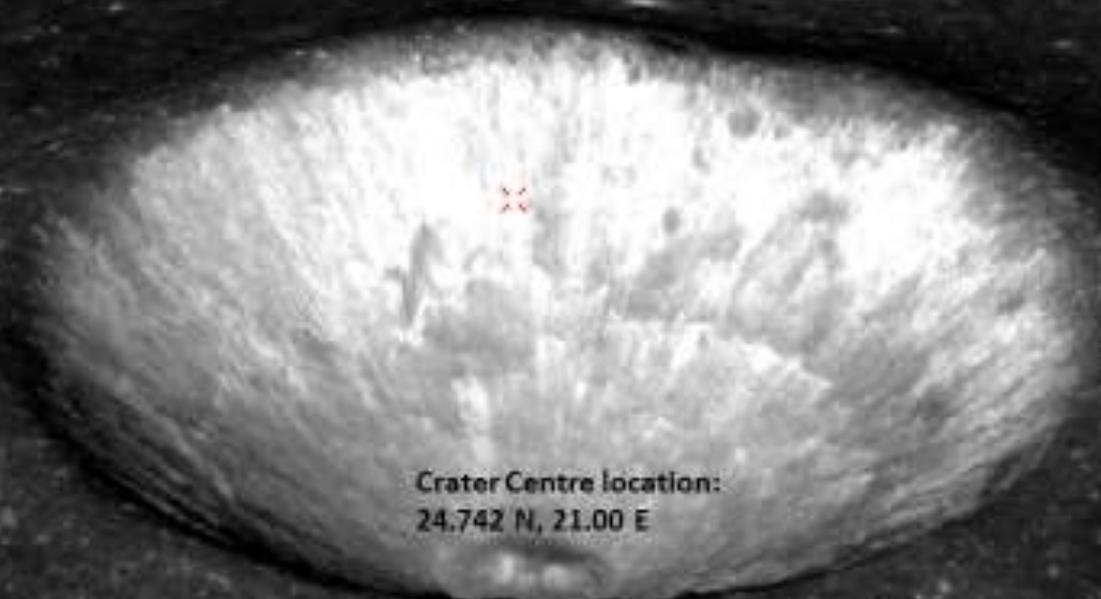
Remote Sensing Policy (Revised)



New Sector Specific Policies

(Launch Vehicle, Navigation, HSP, Technology Transfer, Space Exploration,)

Creation of robust space ecosystem contributing to country's development



Crater Centre location:
24.742 N, 21.00 E

THANK YOU

Diameter of Crater ~ 8 km
Depth of Crater ~ 1.7 km

3D View of Sarabhai Crater Generated from TMC-2 DEM and Ortho-image