

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE**

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Sub: Monthly Summary of Department of space for the month of July, 2024

PART- I (Unclassified)

I. Important policy decisions taken and major achievements during the Month

A. Space Transportation:

- Flight acceptance testing of the cryogenic engine earmarked for the Cryogenic upper stage of LVM3-M5 mission was successfully completed.
- The ignition tests w.r.t pre-burner ignition test article (PITA), demonstrating the smooth & sustained ignition of the pre-burner for the Semi-cryogenic engine development project have been successfully completed at Semi-cryo Integrated Engine Test facility (SIET) at ISRO Propulsion Complex, Mahendragiri.
 - This has provided sufficient confidence to proceed with the testing of Power Head Test Article, which is an intermediate configuration of the Semi-cryogenic engine.
- The second experimental flight for the demonstration of Air Breathing Propulsion Technology was successfully conducted on July 22, 2024 from Satish Dhawan Space Centre, Sriharikota. The propulsion systems were symmetrically mounted on either side of a RH-560 Sounding rocket and launched. The flight test achieved satisfactory performance of the Sounding Rocket along with successful ignition of the Air Breathing propulsion systems.
- The vehicle stages for SSLV-D3/EOS-08 mission are ready for integration at the launch complex in Sriharikota.

B. Space Applications:

I. Earth Observation:

- Agriculture Technology project (for State governments): End of season crop outlook information generated for wheat crop in Maharashtra State for 2023-24. Validation of ML derived yield estimates was done with respect to Crop Cutting Experiment (CCE) data for wheat, gram and mustard crops in Madhya Pradesh for rabi 2023-24.
- Development of hydro-informatic products and services (National Hydrology Project (NHP), for MoJS): Daily simulated water balance components, Daily Actual Evapotranspiration (AET) products, Standardised Water Spread Index (SWSI) products and Standardised Runoff Index (SRI) products were web-published and shared with National Project Monitoring Unit (NPMU)-NHP. GLOF modelling for Mundiksar Glacial Lake in J&K (Indus Basin), and GochungTso (Brahmaputra Basin) for various scenarios is completed.

- Urban Waterbody Information System (UWais) for MoH&UA: Land Use / Land Cover change assessment has been completed for selected (prioritized) waterbodies in 3 cities (cumulative 51 cities).
- Monitoring the Watershed Development Component - Pradhan Mantri Krishi Sinchayee Yojana (WDC–PMKSY 2.0) project using geospatial technologies (for MoRD): Sensitization programme is organized for the state level stakeholders. ISRO participated in the deliberations organized by MoRD on convergence of WDC 2.0 works with MGNREGA.

II. Disaster Management Support:

- International Charter is activated for satellite data support for landslide/debris flow disaster in Wayanad District of Kerala. The crown and path of the debris flow were delineated using IRS data and shared with Government of Kerala.
- Updated version of Flood Hazard Zonation Atlas of Assam State is generated using flood inundation information from 1998 to 2023, and incorporating field verifications.
- 111 flood inundation maps/value added satellite images covering floods in Assam, Uttar Pradesh, Bihar and Karnataka were disseminated to the concerned States.
- Flood Early Warning System (FLEWS, Assam): 16 flood alerts were issued to the Assam State Disaster Management Authority.
- Operational near real time forest fire alerts generation and dissemination is in progress for fire season 2024.
- Seven IRS data products were disseminated to Sentinel Asia for Disaster Management Support for six countries.

C. Human Spaceflight:

- For Gaganyaan G-1 mission, realised Apex cover for Crew Module. Completed generation of interfaces for Crew Module-Service module-connect disconnect systems & crew module aft heat shield and trial suiting of separation systems.
Service Module propulsion system development tests (phase-III) carried out for total duration of 2773 sec. Integration of flight version propulsion system for service module for G-1 mission has been completed. Thermo-vac cycles for solar panel substrates are also completed.
- For 2nd Development flight of Test Vehicle (TV-D2), propellant casting for all solid motors of Crew Escape System (CES), nozzle processing and main parachute trial assembly are completed. Interface generation for propulsion system, conical panel, deceleration system and up-righting system are completed. Avionics packages are also ready for the TV-D2 mission.

D. Space Sciences:

- The all-sky optical airglow imager observations at Srinagar, Jammu and Kashmir reveal different types of ionospheric anomalies possibly imitated by gravity waves (GWs) of tropospheric convective origin.
- In a study to investigate pollutant species and emission sources, it was found that organic matter from biomass combustion and mineral matter from coal combustion can cause high pollution than agricultural stubble burning in an annual scale.
- Long-term (2007-2017) observations to assess convective storms that produce hail over eastern India indicate that, environmental conditions such as convective available potential energy, convective inhibition, lower and mid-tropospheric humidity, temperature, and vertical wind are conducive for intense storms. The above favourable environmental conditions were observed for about 2 hours prior to the hail occurrence over eastern India.
- A comprehensive analysis of 15 of X-ray observations of a low-mass AGN UGC 6728, shows that the variation in the X-ray luminosity of the Active Galactic Nuclei (AGN) is not attributed to the hydrogen column density along the line-of-sight of the source, as UGC 6728 exhibits a bare nucleus.
- Research studies reveal the generation and annihilation of three dimensional magnetic nulls in extrapolated solar coronal magnetic field.
- A study on regional and spatial distributions of columnar aerosols utilizing high-quality ground-based datasets over Asia revealed that the Aerosol Optical Depth (AOD) is the highest over South Asia in each season, followed by South-East, East, and Central Asia.
- In a study on Black Carbon (BC) aerosol emission over Ahmedabad, an increasing trend in the contribution of BC from fossil fuel combustion to total BC at the rate of 29% per year and a decreasing trend in the contribution of BC from wood fuel burning at the rate of 36% per year are detected. This significant decrease in biomass (wood fuel) burning emissions over the past decade is attributed to the adoption of cleaner household cooking fuel.

E. Capacity Building:

- Secretary, DOS / Chairman, ISRO launched the Bharatiya Antariksh Hackathon-2024 programme on 4th July, 2024 with 12 challenges for obtaining the proposal from students. Around 3600 teams have submitted the proposals and 30 teams have been shortlisted for participating in the 30 hours Grand Finale scheduled during 13th -14th August, 2024 at NRSC Hyderabad.
- During this month, 2 patents were granted and 6 patent applications are filed at IPO.

F. Training & Workshop:

Sl No	Name of the course	Duration of the training	Number of participants
1.	ISRO, Sponsored NNRMS Course (8 weeks duration)	May 13 – July 05, 2024	57
2.	One week Geo Spatial Training Programme	July 1-5, 2024	35
3.	One week Orientation course for Indian Forest Service Probationers at Indira Gandhi National Forest Academy	July 8-12, 2024	115
4.	Two week certificate course on 'Open Source GIS Technologies', a skill development programme in Hybrid mode	July 15-26, 2024	15
5.	One week certificate course on 'High Resolution data analysis for automated feature extraction'	July 22-26, 2024	12
6.	Centre for Space Science & Technology Education in Asia and the Pacific (CSSTEAP) organized a short course on 'Weather forecasting using numerical weather prediction models'.	July 22 – August 2, 2024	23 participants from 10 countries
DLP/online virtual mode courses and programmes			
7.	Utilities of sun-induced chlorophyll florescence in vegetation studies	July 18, 2024	1291 participants from 265 network institutions
8.	Potential of NISAR for disaster mitigation and management	July 24, 2024	4462 participants from 666 network institutions

- As part of international asteroid day celebrations on July 03, 2024, a workshop on planetary defense was organised. 175 delegates including 100 students participated in the interactive sessions and three eminent experts from JAXA and ESA delivered technical talks in virtual mode.
- As included in the joint statement released during the visit of President of Kenya to India in December 2023, the exclusive training program for Kenya officials at IIRS on "Remote Sensing and GIS for agriculture information has commenced on July 29, 2024 at IIRS under ITEC scheme. The course is planned for 4 weeks.

G. Safe & Sustainable Space Operations:

- Daily Space Object Proximity Analysis (SOPA) and re-assessment of close approach situation with 2231 Conjunction Data Messages (CDM) from CSpOC/USSPACECOM were performed for 22 LEO and 30 GSO satellites. One Collision Avoidance Manoeuvre (CAM) was performed for Cartosat-2C to avert close approach with MENUT (NORAD No. 55010), a small satellite. A total of 51 Orbital Manoeuvre (OM) plans were screened. Out of these, 8 OM

plans were revised based on SOPA recommendations to avoid potential post manoeuvre conjunctions.

- Extensive coordination was carried out to resolve the 12th July, 2024 close approaches between Chandrayaan 2 Orbiter (CH2O) and Lunar Reconnaissance Orbiter (LRO) of NASA, including an online meet on 9th July 2024. Based on SSOM's request, NASA team made special arrangements to quickly provide the orbital ephemeris after LRO momentum unload manoeuvre on 10th July, 2024 which helped to rule out any CAM requirement for CH2O. Necessary screening was done through BEARCAT (Beyond Earth Collision Avoidance Tool) for OM-85 scheduled on 23th July, 2024 for CH2O, it resolved the potential close conjunction risks with Korea Pathfinder Lunar Orbiter (KPLO) on 25th July, 2024.
- Atmospheric re-entry prediction was carried out for 45 large objects. Regular monitoring of space weather alerts was carried out.

H. International Cooperation:

- 15 member ISRO delegation led by Director, PRL participated in the 45th session of Committee on Space Research (COSPAR) at Busan, South Korea during July 13-21, 2024. ISRO delegates presented technical papers, participated at the Round Table of Space Agency Leaders and side events.

Dr. Anil Bharadwaj, Director/PRL was awarded the Vikram Sarabhai Medal-2024 by President, COSPAR on July 14, 2024 for his outstanding contribution in Space Research in developing countries.

- The Project Plan document for the realisation of the India – Mauritius Joint Satellite was exchanged during the visit of Honorable External Affairs Minister, India to Mauritius.
- On invitation from IAF, an ISRO delegate participated and delivered a talk at the 6th Summit for Space Sustainability hosted by Secure World Foundation and Japan's National Space Policy Secretariat during July 11 – 12, 2024 at Tokyo, Japan.
- Virtual meetings are held between ISRO and other Space Agencies viz. Australia (New Ground station at Brisbane/Sydney), Argentina (ISRO Talk on "Indian Space Ecosystem & Space Policy"), Bhutan (Joint Plan of Action), Senegal & Malaysia (Proposals for cooperation), Vietnam (Ground station), and Mexico & Saudi Arabia (G20 Satellite).

I. IN-SPACe Activities:

- The expression of Interest for Establishing Space Based EO system has been released in IN-SPACe digital platform on July 25, 2024.
- IN-SPACe has released an Announcement of Opportunity for making available Indian Orbital Resource to the Non-Government Entities. Through this AO, Indian ITU Filing at 89deg East, which is in coordination stage, will be made available to one selected applicant. This will enable establishment and operation of an Indian communication satellite.

- IN-SPACe issued authorization to the following 3 NGEs for establishment and operations of Ground Stations in different frequency bands for self-use, and for providing Ground Station as a Service (GSaaS) to Indian and Non-Indian Entities: a) M/s. Avantel Limited, Hyderabad, b) M/s. Dhruva Space Private Limited, Hyderabad, c) M/s. Azista BST Aerospace Private Limited, Hyderabad.
 - The authorization under this category is issued for the first time by IN-SPACe which will enable the authorized NGEs to offer such services globally.
- IN-SPACe has registered 03 additional Indian Entities who wish to disseminate/sell the primary data pertaining to Indian territory and Ground Sampling Data (GSD) > 30 cm commercially from the Earth Observation/ Remote Sensing satellites.
- IN-SPACe Seed Fund Scheme: Announcement of opportunities in Marine Sector.
- Short term Course on “Space Data Products and Services” under the skill development programme conducted from July 07-12, 2024 at IN-SPACe Headquarters, Ahmedabad.
- IN-SPACe led a delegation of Indian space start-ups to the 17th Australian Space Forum in Adelaide on July 24-25, 2024. During the two-day event, the delegation highlighted India's growing prowess in space technology and strengthening international collaboration.
- India-Singapore Space Industry Day Conducted on July 31, 2024.

J. NSIL Activities:

- NSIL organized a meeting between the Industry Consortium (HAL-L&T) and System Reliability (SR) at VSSC to acquaint the consortium with the current ISRO protocols and procedures for quality certification in the fabrication of various launch vehicle systems like Light Alloy Structure, Motor case, etc.
- NSIL signed Launch Service Agreement (LSA) with M/s SpaceKidz for launching their satellite ‘Space Rikshaw-0’ (rideshare mode) on-board SSLV-D3
- Techno-commercial proposal covering both Space and Ground Segments, has been prepared and submitted for the user’s review and approval.
- NSIL signed MoUs with State Government Bodies in Telangana, Andhra Pradesh and Kerala to migrate its satellite tele-educational network from GSAT-8 to GSAT-16 & GSAT-18 satellites. This would enable government bodies to broadcast educational content to the students of the respective states.
- NSIL has provided Launch Vehicle tracking support to a foreign customer through ISTRAC ground station.
- NSIL has signed 12 Technology Transfer Agreements with Indian industries.

2. No of Cases of ‘Sanction of Prosecution’ pending for more than three months: NIL

3. Particulars of cases in which there has been a departure from the Transaction of Business Rules or established policy of the Government: NIL

4. Status of ongoing Swachhta Abhiyan (progress under Special Campaign):

As per the guidelines of Government, Department has chalked out an action plan for implementation of Swachhta Pakhwada 2024 during 1st to 15th February, 2024 and communicated to DDWS and uploaded on Swachhta Samiksha portal.

Based on this action plan, DOS/ISRO Centres/ Units/ ABs/ CPSEs have observed Swachhta Pakhwada 2024 from 1st to 15th February, 2024 with active participation of senior officials, employees, housing colony residents, CIFS personnel, etc. The photograph of events carried out during Pakhwada were uploaded on Swachhta Samiksha Portal.

5. Status of Rationalisation of Autonomous Bodies:

EMC has recommended that NARL be governmentalized. The recommendations of the committee in respect of NARL is under review.

All the AB's under the Department namely, IIST, PRL, NARL & NESAC have been brought under Treasury Single Account.

6. Vacancy position of senior level appointments in the Ministry/Department including Autonomous Bodies/PSUs:

The detailed status regarding all the posts pertaining to Department of Space has been updated on AVMS. The status of updation of vacancy as on 31.07.2024 is as follows:

- Total number of posts required to be entered on AVMS: - 16
- Number of posts filled as on date: - 12
- Number of posts totally vacant as on date: - 04
- Number of posts under premature repatriation – 00
- Number of posts under additional charge arrangement: - 01
- Number of posts that would fall vacant during the next 06 months: - 02

7. List of cases in which ACC directions have not been complied with :- NIL.

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