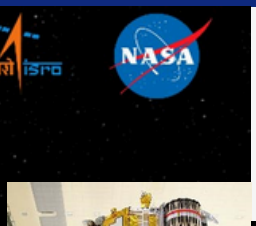
INDIAN SPACE ASSOCIATION
Bhumandal Se Brahmaand Tak

JULY 2025

NEWSLETTER
INDIAN SPACE ASSOCIATION



EXPLORING THE FINAL FRONTIER:

ISpA Newsletter Unveils Future of Sustainable Space Exploration

INDIAN SPACE ASSOCIATION
Bhumandal Se Brahmaand Tak

Welcome to **ISpA Newsletter**, a trusted conduit for illuminating the latest strategic endeavours, technological innovations and industry insights shaping the future of sustainable space exploration.

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DISCLAIMER

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MESSAGE FROM DG-ISpA

On 2nd July, we mourned the peaceful passing of **Shri Shekhar Dutt**, Sena Medal, IAS (Retd.). A distinguished Army veteran, former Governor of Chhattisgarh, and ISpA's revered Chief Mentor, Shri Dutt was a beacon of wisdom and support. His unwavering guidance during our formative years and through testing times left an indelible mark on our journey. We remain deeply grateful for his legacy and extend our heartfelt condolences to his family.

This month also saw the successful hosting of **ISpA's Annual General Meeting (AGM)**, during which a new Executive Committee (EC) was elected. In a step towards greater inclusivity and representation, the new EC includes one core and two startup members, ensuring a broader perspective in shaping our agenda. We express our sincere appreciation to **Shri Jayant Patil** for his outstanding tenure as Chairman. We are fortunate that he will continue to guide us as a mentor.

We are delighted to announce the appointment of **Mr Arun Ramchandani,** L&T, as Chairman of the Governing Body; Mr Rahul Vatts, Airtel, as Vice Chairman; and **Mr Chirag Doshi,** Walchandnagar Industries, as Chairman of the Membership Committee.

Joining the Executive Committee for the 2025–26 term are:

- Mr P. J. Nath, Nelco
- Ms Neha Idnani, OneWeb Communications
- Mr Rohan Verma, CE Infosystems
- Ms Sujatha Deepak, Alpha Technologies
- Dr Vinod Chippalkatti, Centum Electronics

We're also proud to welcome **Elena Geo Systems** and **Kristellar Aerospace** as the startup representatives on the EC—strengthening our commitment to emerging space entrepreneurs.

In our continued focus on strengthening space education, ISpA signed an MoU with **Codimaths** to support the International Space Science Olympiad (ISSO), student hackathons, and mentor young minds in rural India—nurturing future space scientists and innovators.

July also brought two landmark milestones: the successful return of **Group Captain Shubhanshu Shukla** from **Axiom Mission 4**, and the launch of the **ISRO–NASA NISAR mission**—a powerful symbol of India–USA collaboration in space. Our members including **Astra Microwave**, **Axon Cables, Ananth Technologies**, **BHEL**, **Centum Electronics, HAL**, and **L&T** —played significant role in the launch of the joint NISAR satellite. Meanwhile, **HAL** also emerged as the frontrunner in the tech transfer deal for SSLV from ISRO.

We're particularly encouraged by the increasing collaboration within the private space sector. The partnerships between **Dhruva Space & Pixxel**, and **Kepler Aerospace & Astrome**, highlight the growing synergy among our members.

Other notable achievements include **Om Space** raising USD 3 million in funding, and **Ananth Technologies** unveiling plans for a ₹3,000-crore satellite broadband initiative by 2028. We congratulate them all on their accomplishments.

As India's space sector continues to thrive, ISpA remains committed to empowering our members, driving innovation, and enhancing our collective global presence.

Lt Gen A K Bhatt
PVSM UYSM AVSM SM VSM (Retd)
Director General,
Indian Space Association (ISpA)
(Former DGMO, MS & GOC 15 Corps)

HIGHLIGHTS OF THE MONTH

- FRANK AND FORTHRIGHT INTERVIEW WITH DG ISPA
- FIRST STEP INTO CREWED SPACE JOURNEY: LT GEN AK BHATT ON AXIOM-4'S IMPACT ON INDIA
- NISAR – NASA ISRO SYNTHETIC APERTURE RADAR MISSION
- ISRO ANNOUNCES NATIONAL SPACE SCIENCE SYMPOSIUM 2026 (NSSS-2026)
- ANANTH TECH SET TO LAUNCH INDIA'S FIRST PRIVATE SATELLITE BROADBAND SERVICE
- HAL WINS ₹511-CRORE DEAL TO BUILD, OWN AND COMMERCIALISE SSLV LAUNCHES
- DHRUVA SPACE SET TO POWER UP PIXXEL'S NEXT CONSTELLATION WITH SOLIS+ SPACE-GRADE SOLAR PANELS
- SUHORA, OSK PARTNER TO PUT INDIA ON HYPERSPECTRAL MAP, TACKLE KEY ISSUES
- ASTROME ANNOUNCED MOU WITH KEPLER AERO.

MEMBERS BULLETIN

HAL

Government owned defence PSU Hindustan Aeronautics Limited (HAL) won ₹511-crore deal to build, own and commercialise SSLV launches - the smallest rocket developed by Indian Space Research Organisation (ISRO). The technology transfer will take place over the next two years. The SSLV is a three stages vehicle, capable of launching satellites weighing up to 500 kgs into the Lower Earth Orbit (LEO). The move is likely to open new avenues for the private sector to build stronger domestic ecosystem of small satellite markets.

HAL supplied critical hardware for the GSLV-F16 NISAR Mission including:

- 09 types of riveted structures
- 04 types of welded propellant tankages and 02 types of feedlines
- 04Nos of fully integrated L-40 liquid boosters, configured as strap-ons to the core of GSLV-F16
- Satellite Bus Structure: 2.4 tonne category bus structure houses the NISAR Satellite

As the sole manufacturer of such large and complex space-worthy structures in India, HAL continues to play a crucial role in advancing the nation's space capabilities. Timely delivery of all hardware components underscores its commitment to supporting ISRO's ambitious space exploration goals. HAL's contributions to the GSLV-F16 NISAR Mission exemplify its dedication to technological excellence and its vital role in India's space sector. They are proud to be a key partner in this historic launch, further cementing its position as an indispensable contributor to India's space program.

CENTUM ELECTRONICS

Centum Electronics marked a monumental achievement, as it partnered with ISRO for the successful launch of the GSLV-F16 mission, featuring the groundbreaking NISAR satellite, a collaborative marvel developed with NASA. Centum's significant contribution was in delivering over 350 modules and subsystems such as S-Band DCMs, Electronic Power Conditioners, Point-of-Load Converters, and more to the NISAR. This mission is designed to provide detailed insights into changes in Earth's surfaces, including ecosystems, ice masses, and resources, with unprecedented accuracy.

MEMBERS BULLETIN

AXON CABLES

Axon' India was a proud partner on the joint international NISAR mission. The successful launch of the NASA-ISRO Synthetic Aperture (NISAR) satellite, took place on 30th July 2025. The NISAR mission represents a landmark collaboration between NASA and ISRO, aimed at advancing Earth Observation and climate monitoring capabilities.

As a part of this mission, Axon' supplied the following products:

- Complete Bus 1553 Network.
- Space Wire Assemblies for LVDS Data Transmission.
- Axomach connectors and assemblies for 10 Gbps Data Transmission.
- Wires ESCC Family.

ASTRA MICROWAVE

Astra Microwave Products Ltd. contributed with empowering precision enabling products to the first global dual-band SAR mission, jointly launched by ISRO and NASA. The NISAR mission will systematically map Earth using L-band & S-band SAR — capable of detecting surface changes as small as comparable to cms.

ANANTH TECHNOLOGIES

Ananth Technologies to launch ₹3,000-crore satellite broadband service by 2028. While many global players operate in LEO — the company plans to deploy a 4-tonne geostationary (GEO - over 35000 kms from Earth) communication satellite that will deliver a data capacity of up to 100 gigabits per second (Gbps), to users across the country.

ATL delivered 14 critical sub-systems such as power modules, telemetry transmitters, stage control electronic units, besides executing the complete electrical integration of the launch vehicle for the NISAR mission.

MEMBERS BULLETIN

LARSEN & TOUBRO

L&T was a proud partner on the iconic GSLV-F16/NISAR, a joint mission by ISRO and NASA that will study global land and ice-covered surfaces, islands, sea-ice and oceans, providing critical data to the scientific community.

L&T contributed to the project by providing system integration and launch support, as well as fabrication and assembly of OPLF (Ogive Payload Fairing), Solid Rocket Booster, Honeycomb Deck Panel, and Cryo Umbilical plates of the GSLV MK II. This milestone moment reflects L&T's long term commitment to supporting India's space journey.

BHEL

BHEL manufactured three Space Grade Solar Panels (approx. 4 sq. m and 1100-watt capacity), using multi junction solar cells and one Space Grade Li-ion battery (11 KWh), using cylindrical Li-ion cells for the NISAR mission.

In addition to powering the satellite, 112 nos. BHEL-made Li-ion cells were integrated into the Geosynchronous Satellite Launch Vehicle (GSLV) that successfully placed the NISAR satellite into a sun-synchronous orbit at 747km altitude, marking a significant milestone for Indian launch capabilities.

ASTROME

Astrome announced an MoU with Kepler Aero, to develop cutting-edge, high-throughput space-based communication systems across LEO, MEO, and GEO orbits. This strategic partnership brings together: - Astrome's proprietary millimeter-wave, phased array and software-defined technologies and Kepler's growing satellite and global ground station infrastructure. Together, they aim to deliver secure, mission-critical connectivity for remote access, defense, and disaster response, enabling India's vision for a sovereign, multi-orbit communication systems.

MEMBERS BULLETIN

KEPLER AEROSPACE

Kepler Aero signed a strategic MoU with Astrome to revolutionize satellite communication solutions, aiming to accelerate the deployment of high-throughput, multi-orbit satellite communication systems built for real-world defence, disaster response, and remote operations.

No humans needed: Kepler's 6-satellite swarm will hunt threats from space in 90 minutes. The six-satellite constellation will mimic a beehive in orbit, autonomously tracking signals, heat signatures and suspicious movements without ground commands.

EUTELSAT ONEWEB

Eutelsat OneWeb's LEO's constellation will provide high-speed, low latency connectivity for the UK government's operations globally; ensuring seamless support to the FCDO missions across all sectors. Earlier, the company had received an investment from the **UK Government** of €90 million (₹903 crore) as part of a fresh capital infusion in addition to **Bharti Enterprises**'s investmennt worth €120 million (about ₹1,204 crore) in French satellite operator Eutelsat Communications.

The Eutelsat Group also announced securing a definitive 15-year license to operate its OneWeb low Earth orbit (LEO) connectivity services in **Angola**.

MAXAR

Maxar Intelligence was awarded three new multi-year strategic contracts totaling $204.7 million that will help accelerate sovereign defense and intelligence capabilities and space leadership across the Middle East and Africa (MEA). The MEA customers will have direct access to Maxar's geospatial intelligence products, including access to the latest AI-powered change detection capabilities used to build **Sentry**, Maxar's new predictive intelligence solution.

MEMBERS BULLETIN

SES INDIA

SES announced the completion of its highly value accretive acquisition of Intelsat, creating a strengthened global satellite operator with an expanded fleet of 120 satellites across two orbit.

The newly combined company will leverage its skilled team with deep vertical expertise to deliver an integrated multi-orbit, multi-band satellite and connectivity solutions to businesses and government around the world, creating a stronger multi-orbit operator with 60% of revenue in high-growth segments. By integrating the two organizations, SES expects to deliver synergies with a total net present value of €2.4 billion, representing an annual run rate of approximately €370 million, with 70% of these efficiencies anticipated to be executed within three years after closing.

SUHORA

Suhora Technologies, announced a strategic partnership with US-based Orbital Sidekick (OSK) to introduce first-of-its-kind high-resolution hyperspectral satellite services in India. Through this, India will be able to identify rare earth mineral reserves, detect methane leaks from space, and monitor various other geological developments. This landmark agreement makes Suhora the first Indian company to offer commercial operational hyperspectral data of wide-spectrum (VNIR-SWIR), marking a significant leap forward for the nation's earth observation and geospatial data analytics capabilities

OMSPACE

Omspace Rocket & Exploration Pvt Ltd raised $3 million in pre-seed funding to build an indigenous small satellite launch vehicle — **Infinity One.** This breakthrough marks a major milestone in India's growing presence in the global space economy.

Its flagship innovation, Infinity One, is being developed to launch payloads of up to 350 kg to low Earth orbit, focusing on fuel efficiency, reliability, and cost-effectiveness.

MEMBERS BULLETIN

DHRUVA SPACE

Dhruva Space partners with Pixxel to integrate solar panel on its next fleet of hyperspectral satellites. The company pioneers in designing and developing small satellites and key subsystems, including sophisticated Solis+ solar panels, offering 30% efficiency. These panels engineered with high efficiency triple-junction GaAs solar cells are designed to generate several kilowatts of power that is ideal for high-performance satellite missions in Low-Earth Orbit (LEO), in harsh conditions of space.

Dhruva Space is also in process of establishing South Asia's first dedicated spacecraft manufacturing facility, spanning 6.5 acres in Hyderabad. The partnership shows commitment of private sector for shared excellence in driving India's space sector towards global leadership.

ICEYE

ICEYE launched Flood Rapid Impact (FRI) - that delivers automated, near-real-time flood data for emergency managers, energy and utility organizations, insurers, and banks.

ICEYE - an expert in satellite based disaster management solutions, played a crucial role in supporting the government of **Rio Grande do Sul** in its rapid response to the devastating floods in June. ICEYE delivered high-precision SAR imagery captured under heavy cloud cover and real-time flood observations; these critical insights enabled rapid deployment of resources in record time.

ICEYE entered into an agreement with global reinsurer **MAPFRE RE**, to license its Flood Insights data globally, to enhance MAPFRE RE's ability to respond swiftly and effectively to natural catastrophe events.

ESRI INDIA

ESRI India announced opening of a Geographic Information Systems (GIS) and AI Competency Center at a new facility in Noida. The company will invest over INR 150 crores over the next 5 years. This strategic investment aims to foster broader adoption of AI in GIS applications. Building on ESRI India's leadership in the GIS domain, the new center will serve as a dynamic catalyst for the company's focus on GeoAI offerings and empowering customers to enhance their GIS and GeoAI capabilities.

MEMBERS BULLETIN

MAP MY INDIA

MapMyIndia's Mapples integrates DIGIPIN to generate digital addresses. DIGIPIN generates a code or coordinates for a block size of 3.8 meter across India. Users are required to point the pin on the app/platform to generate digital coordinates that can be used with postal addresses for higher degree accuracy. Through this initiative, MapMyIndia is a proud partner of India Post.

PIERSIGHT

PierSight, an Ahmedabad-based spacetech startup building the world's first commercial constellation of Synthetic Aperture Radar (SAR) satellites equipped with AIS sensors was featured on the front page of *Nikkei*, Japan's leading business daily, in their cover story on India's rise as a global space powerhouse.

CEO and Co-founder, **Gaurav Seth**, also contributed an opinion piece, reflecting on the legacy of ISRO and NASA and their historic collaboration on NISAR. Additionally, *YourStory* covered PierSight's mission to address critical ocean challenges through persistent, real-time **maritime monitoring**.

SATSURE KALEIDEO

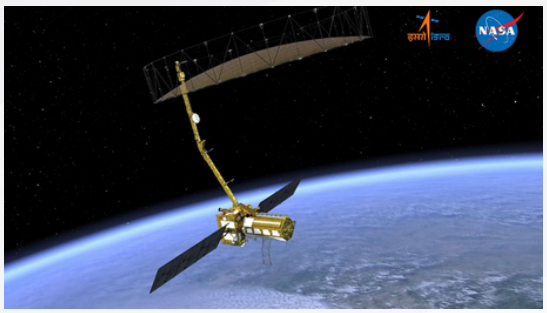
July was a milestone month for SatSure as it expanded its global footprint, strengthened international partnerships, and earned recognition for its Earth Intelligence and impact-driven innovation.

From Paris to Kenya and back home in India, here's a glimpse of what SatSure achieved:

- SatSure attended HEC Paris **IndiaAI Global** Cohort at Station F and showcased India's AI and EO capabilities on the global stage, led by Rahul Dhayal and Shaista Khan as part of the IndiaAI Global Cohort.
- **KALRO Partnership**: SatSure joined hands with Kenya's top agri-research body to drive EO-powered innovation and enable climate-smart agriculture for smallholder farmers.
- **Karman Week 2025 Announcement:** SatSure will host the global space leadership summit, the Karman Week 2025, marking a full-circle moment in its mission to democratize EO data.
- **Times of India Social Impact Award**: SatSure was honoured for Tech & AI Innovation in Sustainability, recognizing our commitment to advancing financial inclusion and decision intelligence.

ISRO INDIAN SPACE RESEARCH ORGANISATION

NISAR – NASA ISRO SYNTHETIC APERTURE RADAR MISSION | 30 JULY 2025



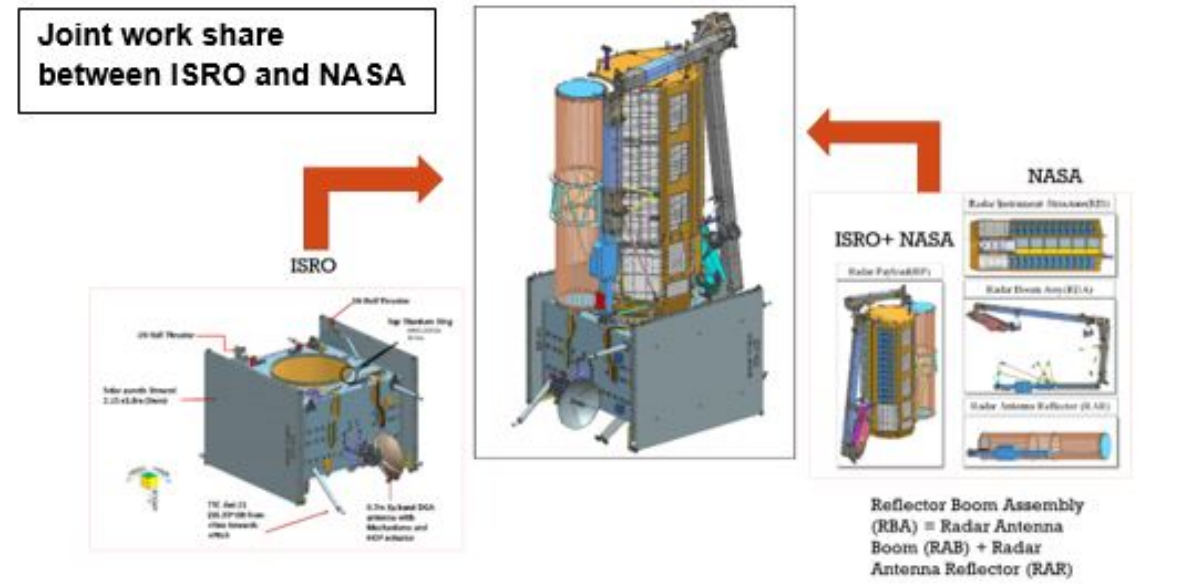
NISAR, jointly developed by ISRO and NASA is an L and S-band, global, microwave imaging mission, with capability to acquire fully polarimetric and interferometric data. The unique dual-band Synthetic Aperture Radar of NISAR employs advanced, novel SweepSAR technique, which provides high resolution and large swath imagery. NISAR will image the global land and ice-covered surfaces, including islands, sea-ice and selected oceans every 12 days.

The Spacecraft was built around ISRO's I-3K structure. It carried two major Payloads viz., L & S- Band Synthetic Aperture Radar (SAR). The S-band Radar system, data handling & high- speed downlink system, the spacecraft and the launch system were developed by ISRO. The L-band Radar system, high speed downlink system, the Solid-State Recorder, GPS receiver, the 9m Boom hoisting the 12m reflector were delivered by NASA.

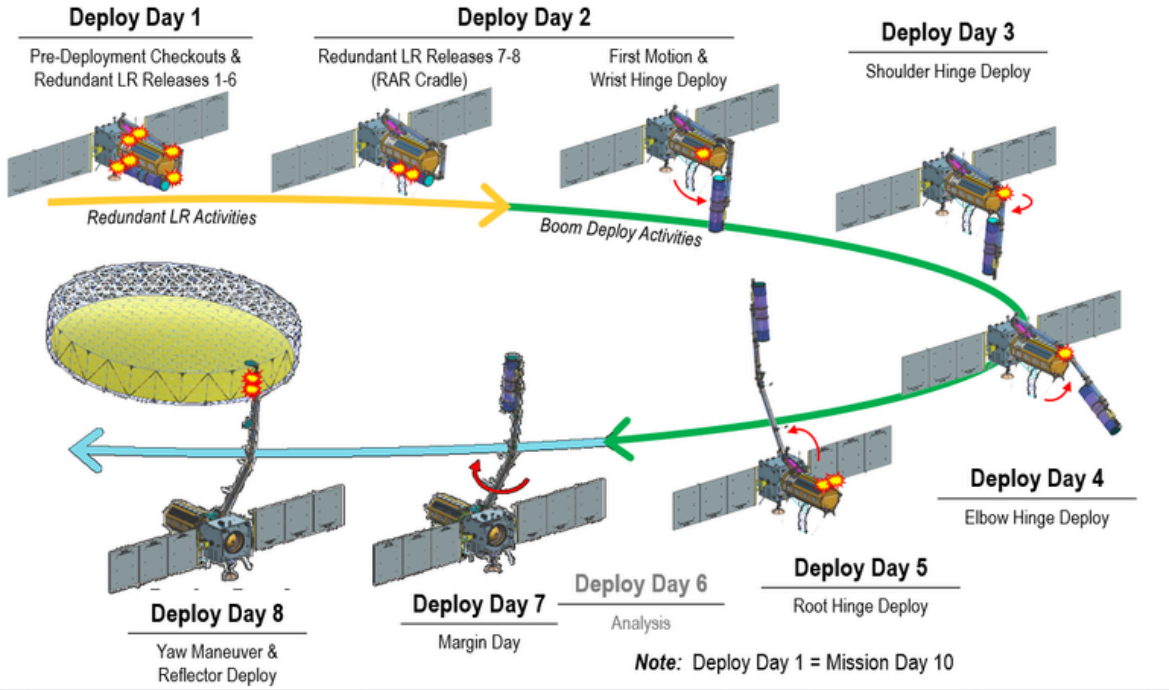
ISRO took care of the satellite commanding and operations, NASA provided the orbit manoeuvre plan and RADAR operations plan. NISAR mission's ground station support was provided by both ISRO and NASA. The data acquired through S-band and L-band SAR from a single platform will help the scientists to understand the changes happening to planet Earth.

ISRO INDIAN SPACE RESEARCH ORGANISATION

NISAR – NASA ISRO SYNTHETIC APERTURE RADAR MISSION | 21 - 25 JULY 2025



Joint work done by ISRO and NASAR



NISAR Mission in Phases

ISRO INDIAN SPACE RESEARCH ORGANISATION

ONE-DAY REGIONAL MEET FOR SOUTHERN STATES & UTS ON "LEVERAGING SPACE TECHNOLOGY APPLICATIONS FOR VIKSIT BHARAT 2047" | 23 JULY 2025

The Regional Remote Sensing Centre–South, National Remote Sensing Centre (NRSC) organised a day regional meet on "Leveraging Space Technology Applications for Viksit Bharat 2047", on 9 July, at ISRO headquarters. the event was attended by over 125 delegates. A document on "Future Requirements of Space Technology and Space Infrastructure," collaboratively prepared by participating States/UTs and ISRO was released. Key presentations included '*Indian Space Program for National Development*' by EDPO, '*Commercial Opportunities'* by NSIL and '*Space Reforms*' by IN-SPACe.

STATE MEET 2025 FOR UTTARAKHAND ON "LEVERAGING SPACE TECHNOLOGY FOR VIKSIT BHARAT 2047" | 9 JULY 2025

NRSC in collaboration with the Government of Uttarakhand organised a State Meet 2025 on Leveraging Space Technology for Viksit Bharat 2047 – Insights from the Himalayan State in Dehradun. CM Dhami said technology is no longer confined to scientific research but has become vital for agriculture, weather forecasting, disaster management, health, and infrastructure development. He said that Uttarakhand is committed to promoting science and innovation, with the goal of integrating scientific tools into governance and service delivery.

NORTH EASTERN REGIONAL MEET ON "LEVERAGING SPACE TECHNOLOGY APPLICATIONS FOR VIKSIT BHARAT 2047 | 9 JULY 2025

A meet on "Leveraging Space Technology Applications for Viksit Bharat 2047" for the North Eastern Region was organised in Guwahati by ISRO and North Eastern Space Applications Centre (NESAC), Shillong, in collaboration with Assam State Space Application Centre (ASSAC).

The event was graced by ministers and officials from the state government. Over 190 delegates attended the programme. Presentations on the Geoportals of ISRO such as Bhoonidhi, Bhuvan, VEDAS and North Eastern Spatial Data Repository (Ne-SDR) were made, in addition to the "Role of NGEs in leveraging space technology applications in NER".

ISRO INDIAN SPACE RESEARCH ORGANISATION

ISRO ANNOUNCEMENTS | JULY 2025

National Space Science Symposium 2026 (NSSS-2026)

ISRO Chairman Dr. V. Narayanan announced 23rd National Space Science Symposium - a biennial event, to be hosted by the North East Space Applications Centre (NESAC), Department of Space, at Umiam, in the state of Meghalaya, during 23-27 February 2026.

The NSSS provides an opportunity to space science researchers to discuss new areas of exploration, findings and challenges.

Its website (https://www.nsss2026.in/) was launched in a virtual session, attended by several senior academicians from various research institutes, officials from ISRO and the organising committee.

IN-SPACe announces registration for the Short Term Course on Essentials of Space Technology in Agriculture Sector from July 27 - August 01, 2025

IN-SPACe in association with ISRO, NGEs and Academia announced registration open for the 'Short-Term Skill Development Course on Essentials of Space Technology in Agriculture', designed to develop basic understanding of Space Technology in Agriculture Sector.

The course is scheduled from July 27 - August 1, 2025 at Amity University, Noida. The participants will be required to take a mandatory quiz, on the last day of the course. The course completion certificate will be provided to the successful participants.

Course Brochure: https://www.inspace.gov.in/inspace id=agri_course_2025_main#:~:text=Download%20Course%20Brochure

The course fee is Rs. 15,000/- (can be remitted by visiting https://bharatkosh.gov.in/.)

ISRO ANNOUNCEMENTS | JULY 2025

ISRO announced teams selected for the Bharatiya Antariksh Hackathon-2025

A total of 14 teams have been selected from colleges and universities across India and their projects include:

1. Simulation/Modelling of Forest Fire Spread using AI/ML techniques
2. AI based Help bot for information retrieval out of knowledge graph created based on static/dynamic content at web portal
3. Monitoring Air Pollution from Space, by an integrated approach using satellite observations, ground-based measurements, reanalysis data and AI/ML techniques.
4. Designing a chain of thought based LLM system for solving complex spatial analysis tasks through intelligent geoprocessing orchestration
5. Chase the Cloud: Leveraging Diffusion Models for Cloud Motion Prediction using INSAT-3DR/3DS Imagery
6. AI/ML-driven automated feature detection and change analysis of glacial lakes, road networks, and urban drainage systems from multi-source satellite imagery
7. Developing Algorithm for Air Quality Visualizer and Forecast App to generate granular, real-time, and predictive air quality information, especially in smaller cities or rural areas.
8. Novel Approaches for Optimizing Deep Learning in Earth Observation with Imbalanced Data
9. Developing an AI/ML-based algorithm for identifying tropical cloud clusters using half-hourly satellite data from the INSAT
10. Identifying halo CME events based on particle data from SWISASPEX payload onboard Aditya-L1
11. Novel method to detect landslides & boulders on the Moon: Using Chandrayaan images
12. ISRO announced teams selected for the Bharatiya Antariksh Hackathon-2025
13. Generation of High resolution Lunar Digital Elevation Model from Lunar Images using Photoclinometry (Shape from Shading)
14. Robust Change Detection and Monitoring and Alert System on user defined AOI using Multi-Temporal Satellite Imagery

The second iteration of Bharatiya Antariksh Hackathon (BAH), a flagship ISRO initiative was launched in June, as a key outreach program to inspire young innovators, to be concluded prior to the National Space Day on August 23.

These 14 problem statements in the area of Geospatial Domain, Space Science, Image Processing and AI/ML, aims to foster creativity and technological advancement among students.

The Grand Finale will take place on 07th & 08th August, 2025 at NRSC, JD Metla Campus, Hyderabad.

ISRO INDIAN SPACE RESEARCH ORGANISATION

ISRO – STC CONFLUENCE -2025 AT IIT KHARAGPUR | 8 JULY 2025

The Indian Space Research Organisation (ISRO), in association with the Indian Institute of Technology (IIT) Kharagpur, organised the second edition of ISRO–STC Confluence on July 1st & 2nd, 2025 at IIT Kharagpur.

Dr. V Narayanan, Chairman, ISRO and Secretary, DoS inaugurated the confluence and released the ISRO - STC Confluence Proceedings in the presence of Scientific Secretary, ISRO and Director, IIT Kharagpur. It is a comprehensive document of compilation of select research projects from the nine STCs established by ISRO in premier academic institutions across the country. These projects have demonstrated significant technological relevance and have contributed directly to various ISRO missions in domains including spacecraft systems, propulsion, sensors, materials, and AI applications.

Around 150 faculty members from ISRO's STCs have participated in the confluence, along with around 50 senior ISRO scientists and deliberated on various research opportunities & challenges in ISRO's current & future missions. Chairman ISRO emphasized the critical role of academia–ISRO collaboration in achieving self-reliance in high-end space technologies. He commended the contributions of the nine STC partner institutions and encouraged deeper scientific engagement in alignment with ISRO's future missions.

This two day's confluence reflected ISRO's deep commitment not only to technological advancement through academic partnership but also invoking thoughts has been shared in this forum.

DEVELOPMENT OF PERSONNEL SPHERE FOR SAMUDRAYAAN PROJECT | 23 JULY 2025

Vikram Sarabhai Space Centre (VSSC), ISRO signed an MoU with the National Institute of Ocean Technology (NIOT), Ministry of Earth Sciences (MoES), to build a Human Occupied Vehicle (HOV) - a spherical vessel for the 'Samudrayaan' project.

Samudryaan is a project under the Deep Ocean Mission of the MoES which envisages the development of MATSYA-6000, a submersible spherical vessel to carry humans into the sea up to a depth of 6km. The VSSC carried out development of material and design of the personnel sphere. MATSYA-6000 is a sphere of 2260mm diameter with a wall thickness of 80mm, made out of Titanium alloy (Ti6Al4V - ELI grade) and is expected to withstand an external pressure up to 600bar under low temperature conditions of -3°C. This has the capability to carry a three-member crew into the deep ocean.

Major challenge in realizing the spherical vessel is the development of reliable, high penetration (80-102mm thick) Electron Beam Welding (EBW) process and the high-energy (7.5MeV) X-ray radiography facility for the Non-Destructive Evaluation (NDE), which is essential for the certification of the human-rated product (to be processed by a third party).

Liquid Propulsion Systems Centre (LPSC) was responsible for developing the process and infrastructure for the welding process and NDE. LPSC-Bengaluru had the facility and expertise to carry out welding up to 20mm thick. To meet the high power demand for welding, the EBW machine was augmented from 15kW to 40kW rating along with additional facilities for chemical cleaning and handling equipment for the higher size and mass. For Non-Destructive Evaluation, the existing X-ray facility in kV range was augmented to 7.5MeV range. Multiple NDE techniques were employed which complement each other in ascertaining weld quality, including Time of Flight Diffraction (TOFD) and Dual Linear Array (DLA) Phased Array Ultrasonic Testing (PAUT).

LPSC developed the welding process through extensive weld trials (nearly 700 trials) for optimizing the process parameters. NDE techniques were established through inspecting artificially created defects and calibration standards were created. The welding procedure specification and weld qualification protocols are getting approved by a third party.

Ring-2 & Ring-3 Sub-assmebly

ISpA ACTIVITIES

Indian Space Association (ISpA) hosts its 4th Annual General Meeting (AGM)

- Indian Space Association successfully concluded its 4th AGM, marking a key milestone in our journey of shaping India's space ecosystem. The meeting saw active participation from members across the industry, both in-person and virtually and underscored ISpA's commitment to inclusive governance and sector-wide collaboration.

Highlights from the AGM:
✅Mr. Arun Ramchandani elected as Chairman
✅ Mr. Rahul Vatts re-elected as Vice-Chairman
✅Election of the new Executive Council for a two-year term
✅ Expansion of the Council from 7 to 8 members
✅Two startup representatives selected via draw of lots
✅ Presentation of ISpA's Annual Report and achievements

DG ISpA hosted Mr. Tony Azzarelli, Vice President, Eutelsat Group at ISpA office.

- Mr. Tony Azzarelli, Vice President, Eutelsat Group , visited ISpA office.. Lt Gen Anil Kumar Bhatt (retd), DG ISpA and Gp Capt TH Anand Rao (Retd), Director ISpA had the opportunity to welcome and interact with Mr. Azzarelli.
- Engagements with global satcom leaders like Eutelsat OneWeb are vital as India advances towards a vibrant, secure, and self-reliant space ecosystem.

ISpA ACTIVITIES

ISpA held its National Advisory Committee (NAC) meeting on 16 July 2025 at the Vivekananda International Foundation, New Delhi

- The meeting was chaired by Director VIF India, and brought together distinguished members from mutiple domains including Armed Forces, Academia, Industry and Finance.
- ISpA welcomed Air Chief Marshal VR Chaudhari (Retd), Former Chief of the Air Staff and Air Marshal SP Dharkar (Retd), Former Vice Chief of the Air Staff ...as new members of the National Advisory Committee.
- The meeting featured in-depth discussions on the current status and key strategic and operational issues impacting the space industry.

DG ISpA attended 3rd Broadband India Summit 2025

- Lt Gen Anil Kumar Bhatt (retd) DG ISpA, was a panellist at the 3rd Broadband India Summit 2025 on "Towards a Connected Bharat: Universal Access, Smart Infrastructure & the Future of Seamless Connectivity"
- He spoke about rapidly evolving digital landscape, role of space-based connectivity, hybrid networks, and SatCom in achieving universal broadband access for India.

ISpA signed an MoU with Codimaths

- ISpA signed an MoU with Codimaths, aimed at expanding access to quality space science education across India, mentoring for the International Space Science Olympiad, support curriculum development aligned with real-world space industry needs.

ISpA ACTIVITIES

DG ISpA attended the 4th convocation of Indian Institute of Information Technology, Kota

- DG ISpA Lt Gen Anil Kumar Bhatt (retd) attended the 4th Convocation Ceremony of Indian Institute of Information Technology Kota in his capacity as Chairman, Board of Governors.
- The event was graced by the Hon'ble Vice President of India Shri Jagdeep Dhankhar as Chief Guest and Hon'ble Governer of Rajasthan Shri Haribhau Bagade ji as Guest of Honour.
- It was a moment of deep pride and reflection, where academic excellence met national service, and the values of discipline, humility, and leadership were celebrated.

ISpA at the French National Day 2025 Celebration

- ISpA attended the *French National Day* celebration on 14th July, hosted by His Excellency Mr. Thierry Mathou, the French Ambassador to India, celebrating Bastille Day and the deep ties between France and India 🇮🇳🇫🇷
- Ambassador Mathou stated, "The values of liberty, equality, and fraternity are not only the pillars of the French Republic—they are shared aspirations that unite us with India."
- The event was also graced by the presence of the hon'ble Minister of Culture and Tourism Shri Gajendra Singh Shekhawat.

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Lt Gen AK Bhatt (retd)
DG, Indian Space Association
PROFIT 360
SPACE CAPSULE HATCH SEALED FOR HOMEBOUND VOYAGE
NDTV Profit


India's path to becoming a space superpower - Cutting Edge
chakra


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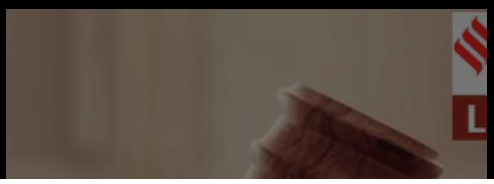
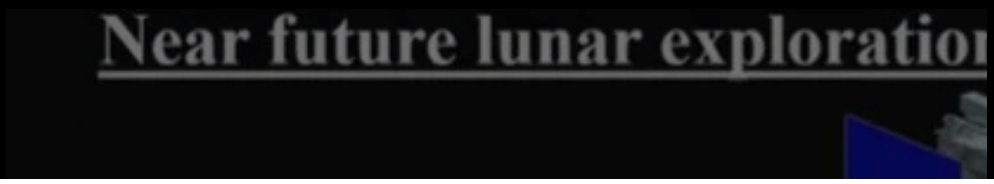
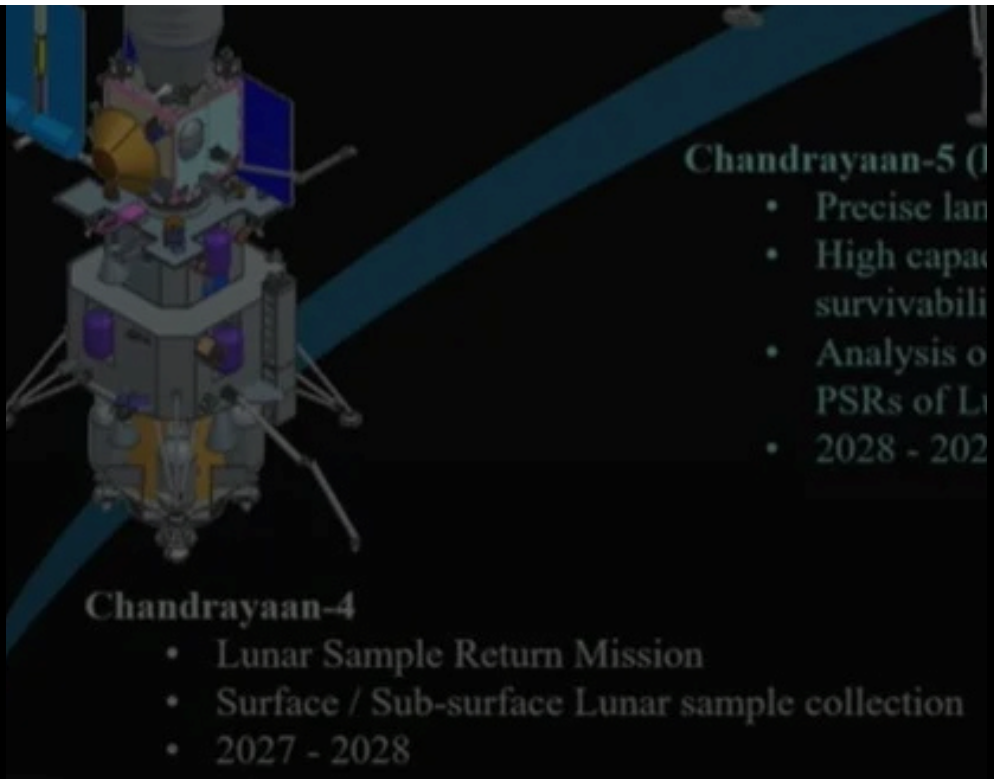




NATIONAL NEWS



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3 navigation satellites to be launched by 2026

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BSNL eyes 5G strategy to stack up against Jio, Airtel, Vodafone, Idea

NATIONAL NEWS

Shukla back on Earth, India's deep space dreams get wings

PHOTO: PTI

Astronaut Shubhanshu Shukla emerges from Dragon Capsule after splashdown in the Pacific Ocean off San Diego on Tuesday. He spent 18 days on the ISS

SHINE JACOB
Chennai, 15 July

For nearly three weeks, Group Captain Shubhanshu Shukla orbited Earth aboard the International Space Station, becoming the first Indian ever to step inside the floating science lab 400 kilometres above the surface. On Tuesday, he returned home — or at least, to the Pacific Ocean off the coast of San Diego — after a journey that spanned 18 days, more than 310 orbits, and roughly 13 million kilometres in space.

The re-entry was textbook. SpaceX's Dragon capsule, which carried Shukla and his three Axiom Mission 4 (Ax-4) crewmates, splashed down at 3.02 pm India time. After undocking from the ISS at 4.50 pm the day before, the return trip lasted just over 22 hours. Recovery boats were dispatched quickly. By 4 pm, the crew had emerged from the capsule, blinking into Earth's gravity once again. Medical teams moved in next, checking vitals and calibrating the toll — and triumph — of spaceflight.

For India, the mission was historic. Shukla is only the second Indian to ever travel to space, following Rakesh Sharma's pioneering journey in April 1984 aboard a Soviet spacecraft. But more than four decades later, India's aspirations are strikingly different: Bigger, bolder, and far more collaborative. The Ax-4 was a joint operation involving Indian Space Research Organisation (Isro), National Aeronautics and Space Administration (Nasa), US startup Axiom Space, and the commercial flight infrastructure of Elon Musk's SpaceX. It also comes as a precursor to Gaganyaan, India's own crewed spaceflight project, slated for launch in 2027. And beyond that, the ambitions grow higher still: A space station of its own by 2035; a Moon mission, with an Indian astronaut aboard an Indian spacecraft, by 2040.

"From space, today's India looks ambitious. It looks fearless. It looks confident. It looks proud," Shukla had said in a message from orbit, a day before leaving for Earth. "And so, *aaj ka Bharat abhi bhi sare jahan se acha dikhta hai* (today's India still looks better than the rest of the world)."

The pride was echoed back on Earth. "I join the nation in welcoming Group Captain Shubhanshu Shukla as he returns to Earth from his historic mission to Space. As India's first astronaut to have visited the International Space Station, he has inspired a billion dreams through his dedication, courage and pioneering spirit," Prime Minister Narendra Modi posted on X. "It marks another milestone towards our own Human Space Flight Mission — Gaganyaan," he added.

India reportedly spent about ₹500 crore on the Ax-4 participation, and the return on investment was more than symbolic.

Turn to Page 6

"... AS INDIA'S FIRST ASTRONAUT TO HAVE VISITED INTERNATIONAL SPACE STATION, HE (SHUBHANSHU SHUKLA) HAS INSPIRED A BILLION DREAMS THROUGH HIS DEDICATION, COURAGE AND PIONEERING SPIRIT. IT MARKS ANOTHER MILESTONE TOWARDS OUR OWN HUMAN SPACE FLIGHT MISSION – GAGANYAAN"
Narendra Modi, Prime Minister

PAGE 18
■ All about Shubhanshu Shukla's 7 experiments in space

Shukla back on Earth, India's deep space dreams take flight

During the mission, the four astronauts conducted some 60 experiments, seven of which were developed by Indian institutions.

For Axiom Space — which is building its own commercial space station — this was its fourth crewed mission. For India, it was a test flight in more ways than one.

Shukla, who was commissioned into the Indian Air Force in 2006, has logged more than 2,000 hours in the cockpit, flying aircraft such as the Su-30 MKI, and Dornier-228. He is also an alumnus of the Indian Institute of Science, Bengaluru — a background that perfectly straddles India's military, academic, and technological spheres. In other words, the right kind of astronaut for a moment like this.

India's space-tech sector is watching closely.

"Such collaborative approaches will enable India to significantly expand its share of the global space economy beyond the current 2 per cent," said Pawan Kumar Chandana, co-founder of Skyroot Aerospace. "It provides our private space-tech companies with the confidence to pursue more ambitious ventures."

The excitement isn't just about one astronaut's journey, but what it symbolises: A nation building not just satellites, but poised for full-scale crewed missions and deep space explorations.

"This achievement is a stepping stone," summed up A K Bhatt, Director General of the Indian Space Association. "It will not only support Isro but also give impetus to both global and Indian private space industries. This success marks a significant stride towards realising India's vision for outer space exploration."

Isro to industry: A giant leap

Isro's tech expertise has found wider uses. Now, IN-SPACe is driving deeper tech transfers to power the private sector's orbital lift-off

SHINE JACOB
Chennai, 15 July

India's space ambitions are on an upward trajectory, and now private collaborations are propelling them further through transfer of technology.

Late last month, the Department of Space, through its nodal agency — the Indian National Space Promotion and Authorisation Centre (IN-SPACe) — announced the transfer of Indian Space Research Organisation's (Isro's) small satellite launch vehicle (SSLV) technology to Hindustan Aeronautics Ltd (HAL) for ₹111 crore.

The landmark move was one of the first instances of the Indian space agency fully transferring a launch vehicle technology to an industry player. This signals a strategic shift in India's space programme as it aims to position itself as a global hub for small satellite manufacturing and launches.

This transfer is not happening in isolation.

HAL and L&T are already collaborating with Isro on the end-to-end manufacturing of the satellite launch vehicle (PSLV) — the first time an Indian launch vehicle is being completely realised by the industry.

Discussions are also underway to involve public sector entities in building Isro's new heavy-lift rocket, Launch Vehicle Mk III (LVM3) — an upgraded version of the GSLV Mk III. Unlike the supplier model adopted for PSLV, this move would see industry players owning the complete value chain.

Further ahead, India is planning industry partnerships for its Next-Generation Launch Vehicle (NGLV), envisioned to enable advanced launch capabilities, including crewed missions and potential lunar landings.

The potential scale of this business is already evident.

Between 2015 and 2024, India earned foreign exchange revenues of $143 million and ₹271 million by launching 393 foreign satellites and three Indian customer satellites for 34 countries, using Isro's PSLV, LVM3, and SSLV. As the country sets its sights on building a $44 billion space economy by 2033, the commercial potential of its launch vehicles will be critical.

"Isro's key space technologies have laid the foundation for India's private space sector," said Rajeev Jyoti, director, Technical Directorate, IN-SPACe. "By acquiring these technologies, the private sector can avoid duplicating efforts and instead focus on building a commercially viable and globally competitive manufacturing base in India."

IN-SPACe, as an enabler, is playing a pivotal role in identifying Isro's technologies that can be offered to the Indian private sector, he added. "The transfer of SSLV technology is a strategic initiative aimed at positioning India as a global hub for launching small satellites in lower Earth orbit (LEO)."

For AK Bhatt, director general of the Indian Space Association (ISpA), these developments point to the faith in the private sector in India. "R&D done by the government is getting transferred to the private sector." This, he added, will play a crucial role in India's ambition of becoming a hub for space manufacturing and launches — including its human spaceflight missions.

Isro has a long tradition of technology transfers for civilian use, well beyond launch vehicles.

A history of spin-offs

Isro's technology transfer efforts date back to the 1970s and '80s, particularly from its work at the Vikram Sarabhai Space Centre and the Isro Satellite Centre.

The first known civilian transfer was polyurethane (PU) foam technology — initially used in rocket motors — which found renewed purpose in prosthetics. It was used to develop lighter, more durable artificial limbs, most notably the Jaipur Foot.

Over the decades, Isro has transferred scores of technologies for diverse applications — from BoryBlum X-Ray tubes and inertial navigation systems for aircraft to data collection systems for flood monitoring, and even biocompatible titanium heart pumps. Other notable spin-offs include smart bionic limbs, silica thermal barriers, fire-retardant coatings, LiDAR (Light Detection and Ranging) systems, and adhesives for industrial use.

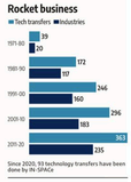
According to Isro data, before the formation of IN-SPACe, the agency had already transferred more than 400 technologies to around 235 industries.

"This mandate builds on a rich legacy of diffusing products, processes, and expertise by the Indian space programme to a wide range of industries, for enterprises of all sizes," said Sreeram Ananthasayanam, Partner, Deloitte India. "Over the years, the department's research indicates that over 400 deep technology products have been transferred. In addition to this, several hundred consultations have been carried out to help companies take up niche capabilities."

He added that the otherwise invisible part of this legacy is how Isro's innovations have catalysed growth in other deep-tech sectors. Even India's telecom success owes much to direct Isro initiatives and skill transference, including work on antennas and ground stations, Ananthasayanam said.


PHOTO: PTI

"EVEN TODAY, BHARAT LOOKS 'SAARE JAHAN SE ACCHA' FROM ABOVE... IT ALMOST SEEMS MAGICAL TO ME... IT HAS BEEN A FANTASTIC JOURNEY FOR ME"
Shubhanshu Shukla
At a farewell ceremony for Axiom-4 mission astronauts who will begin their return to Earth today from the ISS



Since 2020, 93 technology transfers have been done by IN-SPACe

A new era with IN-SPACe

India's tech transfer momentum gained fresh traction after the establishment of IN-SPACe in June 2020, and the Indian Space Policy that followed.

IN-SPACe has also laid the groundwork for building an indigenous earth observation system through non-government entities via public-private partnerships (PPP). Since its inception, IN-SPACe has transferred around 93 technologies, largely in upstream areas such as launch vehicles and associated systems.

"Such initiatives will help the private sector to do well in India, too. The collaborations will help advance space development, driving innovation, economic growth, and technology adoption," said Bhatt. "Most of these transfers are in upstream segments, focused on component development."

The latest of these tech transfers, on July 3, involved the handing over of 10 cutting-edge Isro-developed technologies to six Indian industries. These spanned the upstream, midstream, and downstream segments, and included a ceramic-based flameproof coating, laser gyroscopes, ceramic servo accelerometers, and technologies tied to ground station operations.

The deepening industry participation is also aimed at reducing dependency on foreign technologies in critical areas such as satellite launches, ground station infrastructure, and geospatial applications, said an IN-SPACe official.

And if current projections are anything to go by, the growth story is only accelerating. IN-SPACe Chairman Pawan Goenka recently estimated that in just a few years, India could be launching around three rockets every two weeks, thanks to the SSLV programme with HAL and new-age players like Agnikul Cosmos and Skyroot Aerospace.

That trajectory suggests one thing clearly: the Indian space sector is no longer lost on the launchpad — it's already lifting off.

World's costliest Earth satellite NISAR takes off

Isro, Nasa make history with successful launch of first joint project

SHINE JACOB
Chennai, 30 July

In a major step towards the Indo-US space partnership, the Indian Space Research Organisation (Isro) and the National Aeronautics and Space Administration (Nasa) on Wednesday successfully launched the earth observation satellite, NISAR, from Sriharikota in Andhra Pradesh.

Nasa-Isro Synthetic Aperture Radar (NISAR) is the costliest earth observation satellite till date, with an investment of $1.5 billion. This is also the first joint development project by the space agencies of both India and the United States.

NISAR, weighing 2,392 kg, will scan nearly all of earth's land and ice surfaces twice every 12 days, providing insights into the expansion and contraction of ice sheets, sea ice, and glaciers, the deformation of its crust due to natural hazards, as well as natural and human changes to earth's terrestrial ecosystems.

After the final countdown, the GSLV-F16 rocket lifted off from the second launch pad of the spaceport at 5.40 pm. Following the first two stages of the launch, the mission entered its cryogenic stage by around 5.45 pm.

After completing several parameters with precision and final separation, the mission director announced by around 5.59 pm that the NISAR launch was successful, scripting a new episode in India's space journey.

"All parameters are as expected. This is a culmination of the teamwork of Isro and Nasa's Jet Propulsion Laboratory (California). This is the first joint development project undertaken by the two nations," said V Narayanan, Isro chairman, announcing the success of the mission.

"Successful launch of GSLV-F16 carrying the world's first dual-band radar satellite NISAR is a game changer in the precise management of disasters like cyclones, floods, etc. Also, its capacity to penetrate through fog, dense clouds, ice layers, etc. makes it a pathbreaking enabler for the aviation and shipping sectors," said Jitendra Singh, minister of state for Science and Technology.

Senior scientist Thomas Kurien was the director of the mission, while Chaitra Rao was the project director.

The satellite will help in detecting volcanic changes, landslides, and climate change by taking images of the earth 24 hours a day. These measurements will be carried out by two radar systems — an L-band system built by the Jet Propulsion Laboratory in California, and an S-band system constructed by Isro's Space Applications Centre in Ahmedabad.

This was the first time a Nasa payload was launched aboard India's GSLV (Geosynchronous Satellite Launch Vehicle).

The industry expressed optimism over the successful launch.

"While this mission was primarily led by national agencies, it paves the way for the dynamic Indian private space sector to actively contribute to such cutting-edge collaborations in the near future," said AK Bhatt, director general, Indian Space Association.


Isro's launch vehicle GSLV-F16, carrying NISAR, lifts off from Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh, on Wednesday PHOTO: ISRO VIA PTI

Safely Back On Earth From ISS, Shubhanshu Now Sets Sights On Gaganyaan

Shux Makes A Big Splash

'I Assure You Even The Stars Are Attainable'

Chethan.Kumar@timesofindia.com

Indian astronaut Shubhanshu Shukla (Shux) ended his space mission with spacecraft Dragon Grace's gentle splash into Pacific Ocean off the coast of San Diego at 3.02pm (IST) Tuesday, wrapping up months of training, experiments in orbit, and India's latest stride in human spaceflight participation.

When Wing Commander (retd) Rakesh Sharma soared into space aboard a Soviet spacecraft in April 1984, Shux wasn't even born. It would be another year-and-a-half before he entered the world. Forty-one years later, Shux's Axiom-4 mission comes at a time India is making a deeper entry into human spaceflight, expanding ambitions beyond satellites & rockets. And this hasn't escaped Shux, who had said in his last speech from International Space Station: "As this journey completes... India's human spaceflight journey is both long and challenging. But I assure you, if we decide, even the stars are attainable."

Grace had undocked from ISS at 4.45pm on Monday, carrying, besides Shux, mission commander Peggy Whitson and mission specialists Tibor Kapu and Slawosz Uznanski. As part of the re-entry and splash-down operations, Grace began the 18-minute de-orbit burn around 2.07pm (IST) Tuesday. By 2.27pm, Grace jettisoned the trunk, and the nose cone was closed by 2.32pm.

Around 2.57pm, Grace deployed the drogue parachutes and about a minute later, the four main parachutes got deployed at an altitude of 1,000 metres. In a three-minute operation, these parachutes together reduced Grace's velocity from 560kmph to 28kmph at altitude dropped to 800m, 600m and 400m, before the splashdown.

At 3.07pm, Peggy radioed to mission control that the crew was ready for recovery. By 3.10pm, the recovery boats reached Grace. The recovery personnel, wearing PPE suits, first checked for hazardous gases around Grace before beginning rigging the capsule at 3.15pm, as flight surgeons stood by for the initial medical tests to be conducted.

Between 3.29pm and 3.36pm, Grace was nested on recovery ship "Shannon", when the recovery teams began some routine leak checks and de-rigging and ensured it was safe for the crew to exit from the side hatch.

▶Mission cost ₹548cr, P 17

SPACE ODYSSEY ENDS IN PACIFIC

LIFTOFF & DOCKING
12.01pm, June 25 | Dragon lifts off with Grace
4.15pm, June 26 | Grace docks with ISS
4.45 pm, July 14 | Undocking from ISS complete
DE-ORBIT & SPLASHDOWN
2.07pm, July 15 | Grace begins de-orbit burn
3.02 pm | Splashdown in Pacific Ocean, off San Diego
RECOVERY OPS
3.07 pm | Crew confirms readiness for recovery
3.29-3.30 pm | Grace lifted onto recovery ship Shannon
3.52pm | Shukla exits safely

Shukla's feat has inspired a billion dreams, says PM

As India's first astronaut to have visited ISS, Shukla has inspired a billion dreams with his dedication, courage and pioneering spirit," PM Modi said, terming the journey as a milestone towards India's human space flight mission. "I join the nation in welcoming Grp Capt Shubhanshu Shukla as he returns to Earth," he posted. Space minister Jitendra Singh said, "India has found a lasting space in the world of space," adding that Shukla might be in Delhi by Aug 17. P 17

'Mission has validated India's astronaut training protocols'

Axiom-4 mission has tested and validated India's astronaut training protocols in real space conditions, said Air Vice Marshal Anupam Agarwal, former commandant of the Institute of Aerospace Medicine, which is selecting and preparing Gaganyaan astronaut-designates. "Not only was Shukla well selected but also the test standards we developed, procedures we followed and psychological selection methods have now being put through a real microgravity test," Agarwal told TOI. P 17

> The excitement is endless and we are very proud (of son)... The whole country is celebrating with us... I will cook his favourite food, whatever he loves to eat
> —ASHA SHUKLA | SHUX'S MOTHER

India, US to work on more ambitious space projects

NEW DELHI, DHNS: Following the successful launch of the Nasa-Isro Synthetic Aperture Radar (NISAR), India and the US are likely to work closely on more ambitious space projects such as long-duration human spaceflight missions, space-flight safety, and planetary protection, sources said here on Wednesday.

In the wake of the jointly-developed NISAR Earth-observation satellite and the AX-4 mission that ferried Indian astronomer Group Captain Shubhanshu Shukla to the International Space Station, the two countries are set to take a closer look at several other space collaborations.

"Long-duration human spaceflight missions, space-flight safety, and sharing of expertise and professional exchanges in emerging areas, including planetary protection, could be some of the areas for collaboration," said the sources.

The two nations were also reportedly committed to furthering commercial space collaboration through industry engagements in conventional and emerging areas, such as connectivity, advanced spaceflight, satellite and space launch systems, space sustainability, space tourism and advanced space manufacturing.

"While the NISAR mission was primarily led by national agencies, it paved the way for India's private space sector to actively contribute to such cutting-edge collaborations in the near future," said Indian Space Association Director General Lt Gen (Retd) A K Bhatt.

Earlier this year, Prime Minister Narendra Modi and US President Donald Trump called for more cooperation in the space sector and described 2025 as the year for pioneering space collaboration.

Isro acknowledges importance of Axiom-4 mission that cost ₹548cr

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By 3.37pm, Grace was being moved from its initial place on Shannon to a deck where the crew was expected to come out. Between 3.40pm and 3.41pm, the recovery personnel opened the side hatch and began preparations to allow the crew to exit.

At 3.49pm, Peggy slid out of the capsule with a smile, followed by Shux at 3.52pm and mission specialists Slawosz Uznanski and Tibor Kapu in the next couple of minutes. The crew was taken to land by helicopter. Following medical checks, they will be taken to Houston for de-briefing and other procedures.

Like Shux, Isro has acknowledged the importance of the mission that has cost India Rs 548 crore. "...Ax-4 is one small step in orbit, but a giant leap in India's pursuit of human spaceflight and scientific discovery," the agency had said post launch.

Isro chairman V Narayanan had told **TOI** earlier that benefits from Ax-4 far outweigh the cost. He had stressed that learning outcomes — spanning astronaut training (for two), mission operations, and hardware-software-human interface — could not be measured purely in monetary terms.

Indian Space Association director general Lt Gen (retd) AK Bhatt said: "This is a stepping stone for India's future crewed space journeys, including Gaganyaan and goals of landing an Indian on the Moon by 2040. It'll not only support Isro but also give impetus to both global and Indian private space industries."

Satcom Industries Association-India president Subba Rao Pavuluri, echoing Bhatt's views, said: "...While our ancestors explored Planets with intuition, we'll be exploring planets with experimentation and going there. Shukla's mission is the first step to realise 'Bharat's Space ambitions'."


ANI

Shubhanshu Shukla's father Shambhu Dayal Shukla and mother Asha Shukla get emotional as they celebrate his and the Axiom-4 crew's return

INTERNATIONAL NEWS

INTERNATIONAL NEWS

USA

- Ontario cancels internet deal with Musk's Starlink as part of US tariff fight
- LEO satellite communications services spending to reach USD 18.4 billion in 2026: Gartner
- SpaceX launch from California marks 2nd Starlink mission in 24 hours (video)
- Starlink back after downtime in US: here's how Elon Musk's satcom service outage affected users
- Starlink suffers rare global outage, disrupting internet access worldwide; Elon Musk apologizes
- From Boeing: two Boeing-built O3b mPOWER satellites successfully launch, enhancing SES constellation
- ALL.SPACE awarded ESA contract to pioneer 5G integration
- Italy's Lombardy picks group using Starlink to test satcom services
- Its eye on space, how the Vera C Rubin Observatory will reveal the cosmos like never before
- Space Systems Command Gives Nod to Boeing Over Northrop Grumman for ESS Satellites
- Globalstar Signs SpaceX Deal to Launch Next-Gen Satellite Services
- SSC awards $2.8 billion contract for the first two satellites of the Evolved Strategic Satellite Communications (SATCOM) [ESS] program
- Space Force picks Boeing for $2.8B strategic communications program
- This satellite scans entire Earth every 20 mins, reports wildfires
- Amazon's Project Kuiper and SpaceX are competing in a space race
- SpaceX launches advanced European weather satellite, lands rocket at sea (video, photos)
- Former OneWeb CTO Massimiliano Ladovaz to Lead SpinLaunch

INTERNATIONAL NEWS

CHINA

- Satellite spies both ISS and China's Tiangong space station
- See Tianzhou 9 cargo mission dock at China's Tiangong space station
- China's iSpace returns to flight with successful orbital solid rocket launch
- China launches remote sensing satellite for Pakistan with Kuaizhou-1A rocket
- China adds new satellites to Guowang constellation, eyes accelerated launch rate
- China tightens quality oversight over commercial space projects
- China conducts structural tests for Long March 10 human spaceflight rocket
- China enters race for LEO broadband dominance
- Experimental Chinese satellite turns up in unexpected orbit
- China is practicing orbital warfare to win in space
- Chinese scientists propose 2033 Neptune orbiter mission
- Lunar lava tubes on Earth? China completes underground moon simulation test area
- China launches new spacesuits, other supplies to Tiangong space station
- Why is the moon's far side so weird? China's lunar sample-return mission may have figured it out
- What's inside the 'space package', new spacesuits and fitness gear?
- China's Chang'e-6 mission team wins IAF World Space Award
- China sets up International Deep Space Exploration Association
- China launches Shiyan-28B 01 test satellite
- China's Shenzhou-19 astronauts meet press after return from space
- China's orbital maneuvers blur the line between peaceful and provocative
- China launches first classified Shiyan-28B experimental satellite

INTERNATIONAL NEWS

OTHER NATIONS

- South Korea wants to build a moon base by 2045
- UK Space Agency announces funding for major satellite communications projects at national conference
- Rogers Launches Nationwide Satellite-to-Mobile Text Messaging Service - Canada
- Bittium and Terrestar Advance Direct-to-Mobile Satellite Connectivity with 5G NTN Development: Canada
- Oxford Space Systems deploys S-Band helical antenna for Astro Digital enhancing satellite communication capabilities
- EarthDaily nets $60 million loan to ramp up constellation expansion
- Europe on the moon: ESA targeting 2031 for 1st 'Argonaut' lunar lander mission
- ESA selects 5 rocket companies for European Launcher Challenge
- Europe working to launch 'Invictus' hypersonic space plane by 2031 (video)
- Russia launches satellite for Iran toward orbit alongside 2 space weather probes (photos)
- Russia launches Progress 92 cargo ship toward the ISS
- Russia launches Progress 92 cargo ship toward the ISS
- Europe's Mars sample return orbiter moving ahead despite NASA budget uncertainty

GOVERNMENT POLICIES/ CONSULTATIONS/ RECOMMENDATIONS/ ANNOUNCEMENTS

Andhra Pradesh Government Released its Space Policy 2025 - 2030

Strategic goals under New Andhra Pradesh Space Policy (4.0) 2025-2030

- Establish two dedicated space industrial zones — Space City In Sri Satya Sai District (along Hyderabad- Bengaluru Industrial Corridor) and Space City in Tirupati District — for design, R&D, manufacturing, and launch-related activities
- The policy will facilitate investments amounting to INR 25,000 crore in the space sector over the next ten years
- Create 5,000 direct jobs and 30,000 indirect jobs in high technology space-linked domains

Concept & Designed by:
Ramya Kapoor
Associate - Outreach Initiatives

ISpA UPCOMING EVENTS

INDIA INTERNATIONAL SPACE CONCLAVE (IISC 2025)

The 4th edition of ISpA's annual flagship event (previously Indian Space Conclave), now named the **India International Space Conclave (IISC 2025)**, will be held from **18th to 19th November 2025, at The Lalit, New Delhi**.

This year, we are exploring themes under ***"Expanding Horizons: Innovation, Inclusion & Resilience in the New Space Age".***

IISC 2025 will bring together a diverse and global mix of stakeholders, engaging through panel discussions and impactful industry presentations. The Conclave will explore the future of the global space economy and India's growing role in it.

Held as part of ISpA's Foundation Day celebrations, IISC 2025 will serve as a strategic platform to showcase innovation, deepen international cooperation, and shape policies and partnerships that will define the New Space Age.

For more information, to register & participate, we welcome you to scan the below QR and explore our events page or reach out to our ISpA team.

Scan me!

INDIAN SPACE ASSOCIATION
Bhumandal Se Brahmaand Tak

JULY 2025

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- Bharti Airtel
- CE Info Systems (Map my India)
- Eutelsat OneWeb
- Larsen & Toubro
- Nelco (A TATA Enterprise)
- Walchandnagar Industries

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- BosonQ PSI Tech
- Caliche
- CI4
- Computational Imaging Tech (CI-Metrics)
- CYRAN AI Solutions
- Dhruva Space
- Digantara
- Elena Geo Systems
- GalaxEye
- Geo Solutions India
- Hyspace Technologies (SkyServe)
- Indian Technology Congress Association
- Inspecity Space Laboratories
- KaleidEO Space Systems
- Kawa Space
- Kepler Aerospace
- Kerala Spacepark
- Maan Defence
- Manastu Space
- Micronet Solutions
- Omspace Rocket & Exploration
- OnEarth Space TS
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