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ATHARVA ROBOTICS CENTER

Daily News on Innovation & Technology

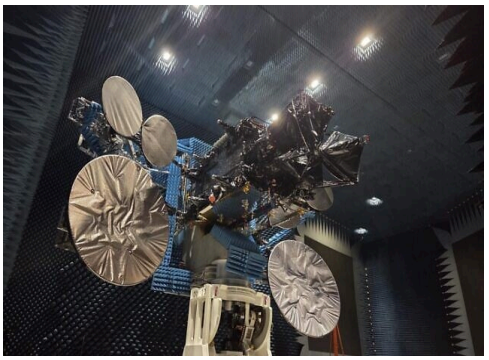
14th July, 2025

Wearable robot to help conduct military aircraft, satellite launch systems' maintenance

By Prabhat Ranjan Mishra, July 13, 2025

A wearable robot has entered into its commercial journey as it has been deployed for Korea Air's services. Developed by Hyundai Motor and Kia, the wearable robot X-ble Shoulder is set to be deployed in various aircraft assembly and maintenance sites.

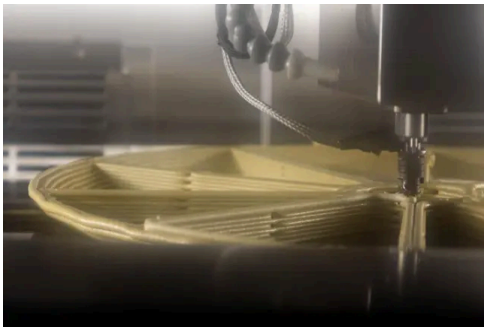
Israel's most-advanced communications satellite successfully launched into space



By Emanuel Fabian, July 13, 2025

Israel's Dror-1 communications satellite has been successfully launched into space from Cape Canaveral. The Israel Aerospace Industries satellite was taken into orbit on a SpaceX Falcon 9 two-stage rocket. The first stage of the booster, which has now been used 13 times, landed back on earth on a platform at sea.

US lab plans dual-material 3D printing method that could boost aircraft, energy tech



By Aman Tripathi, July 13, 2025

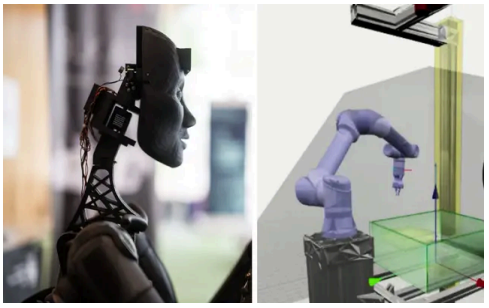
A new research partnership between the Department of Energy's Oak Ridge National Laboratory (ORNL) and manufacturer JuggerBot 3D aims to develop a single 3D printing system for both thermoset and thermoplastic materials.

SpaceX launches mystery satellite to geostationary transfer orbit

By Mike Wall, July 10, 2025

SpaceX launched a mystery satellite to geostationary transfer orbit (GTO) from Florida's Space Coast early Sunday morning (July 13).

Canada firm's 99.9% reliable robot vision training studio completes week-long task in hours



By Prabhat Ranjan Mishra, July 13, 2025

A Canadian company has advanced its web-based design and AI training studio that simplifies 4D vision-guided robotic projects.

China Builds World's Lightest Mind-Controller That Turns Bees Into Military Cyborgs

By Abhinav Singh, July 13, 2025

Scientists in China are turning nectar-sucking bees into modern warfare cyborgs by inserting small controllers into their brains and dictating where they can fly.

World's most accurate artificial tongue mimics human taste using graphene and AI

By Aamir Khollam, July 11, 2025

Scientists have built a graphene-based device that can taste with near-human accuracy in a breakthrough that pushes artificial sensing closer to human ability.

News Articles

How 'Grace' will bring Shux back to Earth

Chethan.Kumar@timesofindia.com

Bengaluru: Indian astronaut Shubhanshu Shukla and his three Axiom-4 (Ax-4) mission crewmates are expected to undock from International Space Station (ISS) at 4.35pm IST on July 14, according to current plans. If everything goes as planned, Crew Dragon — nicknamed "Grace" — is expected to splash down off the coast of California around 3pm IST on July 15 after a series of re-entry manoeuvres.

Following his return, Shukla will undergo a rehabilitation programme of approximately seven days under supervision of flight surgeons to re-adjust to Earth's gravity. As the crew prepares to journey homeward, **TOI** gives a lowdown on how Grace will bring Shukla and others back to Earth

Prep In New Orbit

Grace's return journey begins with a carefully planned departure from ISS. Astronauts will suit up and strap into their seats inside the capsule, after which the hatch connecting Grace to ISS will be closed and sealed.

Engineers on the ground and crew on board will then conduct leak checks and system diagnostics to ensure the spacecraft is ready for autonomous undocking. Once cleared, Crew Dragon will separate from ISS and begin a series of small thruster burns to distance itself and shift into a new orbit in preparation for re-entry.

Orbital Phasing

This orbital "phasing" manoeuvre can last from a few hours to over a day, depending on orbital mechanics and readiness of the designated splashdown site.

When conditions are optimal, SpaceX will command a deorbit burn — the most critical manoeuvre of the return. Just before this, the spacecraft will jettison its trunk section, housing solar panels and radiators. The deorbit burn uses onboard thrusters to slow the capsule down and drop it out of orbit. With it, the spacecraft is committed to Earth re-entry.

Peak Heating Phase

Once Grace begins plunging through upper atmosphere at speeds near 28,000 km/h, it will encounter intense friction that heats the exterior to over 1,900°C. A protective heat shield will deflect this energy, keeping the cabin safe. During the hottest phase, the spacecraft will be surrounded by ionised gases, leading to a brief communications blackout lasting around six to seven minutes.

Once through peak heating, the spacecraft will slow rapidly. Around 5,500 metres above the ocean, two small drogue parachutes will deploy to stabilise the vehicle. A few seconds later, four large main parachutes will unfurl, significantly reducing descent speed to a safe range of around 24-32 km/h.

Splashdown & Recovery

Grace will then splash down in the ocean, usually within a predetermined recovery zone. Waiting nearby will be a SpaceX recovery ship equipped with fast boats carrying medical and technical teams. These teams will be first to reach the capsule, perform safety checks, and prepare it for lifting onto the ship using a hydraulic cradle.

Once aboard, astronauts will be carefully helped out of the capsule and given preliminary medical assessments. They will be then transported back to land — usually via helicopter or ship — and taken for further medical evaluations, mission debriefs, and recovery procedures.

Grace itself is expected to be later refurbished for potential reuse. The entire operation is designed for precision, safety and efficiency, with most of the sequence being fully automated but capable of manual override if needed, and, if it comes to that, it will be Shux's responsibility.

INDIA STILL 'SARE JAHAN SE ACCHA', SAYS SHUX

- Muhammad Iqbal's words, "Sare Jahan Se Accha", echoed in space once more, 41 years after it was first uttered by Indian astronaut Rakesh Sharma. This time, it was astronaut Shubhanshu Shukla (Shux), who reiterated the sentiment from ISS

TOI Explains

- In his final message, Shux said in Hindi during Ax-4 crew's farewell ceremony Sunday, "Forty-one years ago, an Indian went to space and told us how India looked. And I'm sure all of us want to know how India looks today. Today's India looks ambitious, fearless, confident, filled with pride. And because of all of this, today's India still looks better than the whole world (Sare Jahan Se Accha)."
- Addressing fellow Indians at home, he said, "India's human spaceflight journey is both long and challenging. But I assure you, if we decide, even the stars are attainable."
- Shux's message capped off an eventful two-and-a-half weeks aboard ISS, where Ax-4 crew conducted scientific experiments, technology demonstrations and education outreach activities.
- He expressed gratitude to Isro, Axiom Space, Nasa and SpaceX for making the mission possible, and acknowledged students and researchers at home who contributed to the outreach and science programmes. "I carry with me a lot of memories and learnings. But what stays with me most is what humanity can achieve when we all come together for a common goal."

Source: The Times of India Newspaper, 14-07-2025
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Link: https://drive.google.com/file/d/1V2Bi7UoJ_P9hG09B9gX3pMII4Zq2bmU9/view

US Copper Tariff may Impact India's Electronics, Chip Plans

IN THE LINE OF FIRE Experts say ripple effects could be deeply disruptive for India's semicon mission

Suraksha P

Bengaluru: President Donald Trump last week announced a steep 50% tariff on copper imports into the US, triggering an alarm across global supply chains and raising concerns in India's electronics and semiconductor industries.

While the measure is primarily aimed at boosting domestic copper production in the US, Indian executives said the ripple effects could to some extent disturb India's chip and electronics manufacturing efforts under its semiconductor mission.

India's reliance on imported high-purity copper materials could become a serious bottleneck as global trade barriers proliferate and disrupt the supply chain, said industry leaders. They urge the Indian government to move swiftly — not just by streamlining import procedures and BIS certifications but also by investing in the domestic production of high-grade copper alloys and materials essential to the electronics and chip value chain.

INDIRECT BLOW

"Copper is critical for chip wiring, PCBs, interconnects, and power systems," said Ashok Chandok, president of SEMI India and the India Electronics and Semiconductor Association (IESA). "India imports a large share of its refined copper and concentrates. Even gold-plated copper wires used in outsourced semiconductor assembly and test units are facing procedural hurdles."

Copper is a critical raw material in electronic manufacturing, widely used in printed circuit boards (PCBs), capacitors, resistors, connectors, relays, and wiring for semiconductor packaging and assembly.

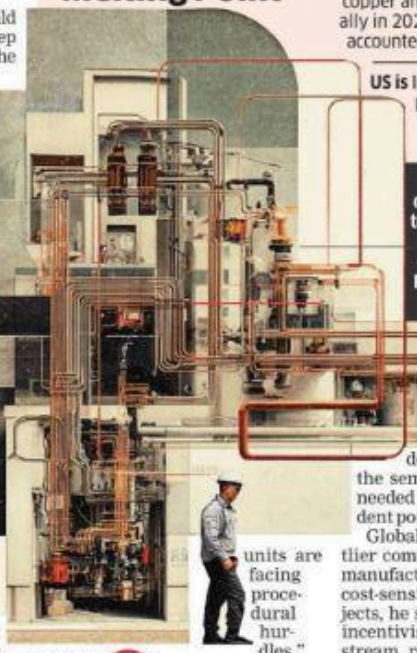
Domestic suppliers like Hindustan Copper, Sterlite, and Hindalco do not currently produce the semiconductor-grade copper needed at scale, the IESA president pointed out.

Global supply issues and costlier components will increase the manufacturing cost and slow down cost-sensitive semiconductor projects, he said. "India must not just incentivise fabs but also build upstream resilience — through domestic refining, free trade agreements, and even strategic reserves."

Semiconductors aren't directly hit by tariffs, said Kunal Chaudhary, partner and co-leader of the Inbound Investment Group at EY India. "But disruptions in copper, critical for chip wiring, are pushing up costs and shifting policy focus. This is slowing India's chip momentum and making things more expensive for global supply chains."

FOR FULL REPORT, GO TO www.economictimes.com

Melting Point



India exported $2 billion worth of copper and copper products globally in 2024-25; exports to the US accounted for $360 million (17%)

US is India's third-largest copper export market, after Saudi Arabia (26%) and China (18%)

Any dip in US demand due to tariffs is expected to be absorbed by India's domestic industry

Rising copper prices and trade disruptions may indirectly impact India's semiconductor push

ET Insight

As trade barriers proliferate, India's reliance on imported materials could become a serious bottleneck. Govt must move fast to invest in domestic production

Siddu's Tuesday Meet to Decide on Devanahalli Land Acquisition

Our Bureau

Bengaluru: Protesting farmers from Devanahalli have offered to give up 449 acres near the international airport for the proposed high-tech park if the government fixes a rate of ₹3.5 crore per acre. The state government will take a decision on the demand at July 15 meeting to be chaired by chief minister Siddaramaiah. Industries minister MB Patil, speaking to the media on Sunday, said he hoped a solution would emerge on Tuesday.

The farmers are demanding higher compensation, suitable jobs for locals who are giving up their lands and declaring the surrounding areas a yellow zone.

Patil said the government was keen to balance the interests of farmers with the need for industrialisation. There are demands from local protestors to preserve the agricultural lands, which has led to a thinking in the government to declare the region a green zone. The government, the minister added, was aware not all protesters were genuine farmers and some of them have already entered into agreements with big builders agreeing to sell their lands for real estate. Farmers of Channarayapatna hobli in Bengaluru rural district have been on a protest seeking to stall the acquisition.

Source: The Economic Times Newspaper, 14-07-2025
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Link: https://drive.google.com/file/d/1R1eF_EokRifg0Y93P7SG5LcNAdYOHb3g/view

Focus on AI

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I am not glossing over the fact that international (revenue) has not grown fast enough. I am just correcting things that international last quarter (January-March) had minor growth, this quarter (April-June) had a minor degrowth. Essentially, it's been that international (revenue) has been very static. And domestic (revenue) has been subject to whatever happened in BSNL.

Is it fair to say that TCS has depended too much on the BSNL deal over the last two years; it's like being a one-trick pony?

It's a very unfair criticism to call TCS the one-trick pony, because our annual revenue is now above $30 billion. And BSNL is probably about $1 billion or something. So, calling $1 billion out of $30 billion and saying TCS is a one-trick pony is a disservice. If TCS is getting impacted, other players are also getting impacted. It's not that somebody is growing at 10% and we are growing at 1%. At the same time, we are not losing market share to anybody. We are doing quite well and we are participating in almost all the opportunities in the market.

You said you expect the international business this year to be better than last year. So, what gives you hope? How do you continue to keep the company growing amid this uncertainty?

One of the big moves that we did recently is to align some of our service lines around our big bets. And then we spruced up our management team around that with our COO (chief operating officer) coming in, focusing specifically on service lines. And then wanting to infuse AI in every one of these service lines, and trying to go with the integrated solutions to our clients. So, we are taking a number of steps and working with our key customers to increase the adoption of AI and other technologies.

TCS has a new COO in Aarthi Subramanian, and she is looking at new service lines. How will there be a split of responsibilities, and will there be more senior level changes?

As for Aarthi, currently she is focused on service lines and trying to see how do you stitch these multi service line opportunities, and how do you deliver benefit to the customers, leveraging new technologies. And also developing the whole capability and talent within the organisation. So, her approach currently will be from a service line perspective. But otherwise, organisational change is a continuous process. We also got Mangesh (Sathe as chief strategy officer), where we thought we need to have someone who will focus on running a strategy office.

Are you seeing new competition coming from smaller firms bringing in newer models? How do you see the IT services model to evolve in the next two years with AI?

One, definitely newer competition will come. And many of them believe that they can provide the same service at a different price point or different productivity forms. At the same time, companies like TCS have an inherent advantage because the technology by itself doesn't give you the results. We need the contextual understanding of what works for a given customer because you've been seeing this AI wave for almost the last two and a half years. But still we are asking questions on where is our return on investment? It hasn't really scaled. That's because organisations have a legacy and there are certain ways they work. So, it takes time.

And companies like TCS have a much better understanding on how to work with enterprises to deliver the results. It's just not the technology solution alone. So that's where we come in. But at the same time, every now and then, new competition keeps coming up, somebody may have a great solution, somebody may have a great methodology. And again, some of them you compete with, some of them you work along because there could be a complementarity where you can work with.

Do you think the overall model is going to get disrupted very quickly?

I don't know very quickly. But there could be a disruption. I'd rather call it a transition or a transformation or evolution, like companies say 20% or 30% code is machine generated. So that number will keep increasing. But at the same time, immediately all the programmers will not go away because somebody has to validate the code generated by these machines because they are not 100% accurate every time. So, there are so many other opportunities that will keep coming up. Yes, the traditional SDLC (software development life cycle) that we are used to seeing in terms of somebody doing a design, somebody doing coding, somebody doing testing, it will evolve; it will change and new roles may come into play.

What are your thoughts on the BPO consolidation? What do you think are the possibilities there with AI?

We announced a number of agents that we have developed that we have also deployed. In fact, I called out two years ago that BPO is one of the industries that would get disrupted even before the traditional coding. Because there are a lot of opportunities for creating AI agents or agentic AI. Both of them have a very strong role today. You would see that business evolving faster (than others).

HIDATO

FIND THE PATH - SOLVE THE PUZZLE

Complete the grid so that numbers 1 - 64 connect horizontally, vertically or diagonally.

	24						
	25	27	28		38		42
	21			30		45	44
		19			34		47
		18					

Source: The Economic Times Newspaper, 14-07-2025
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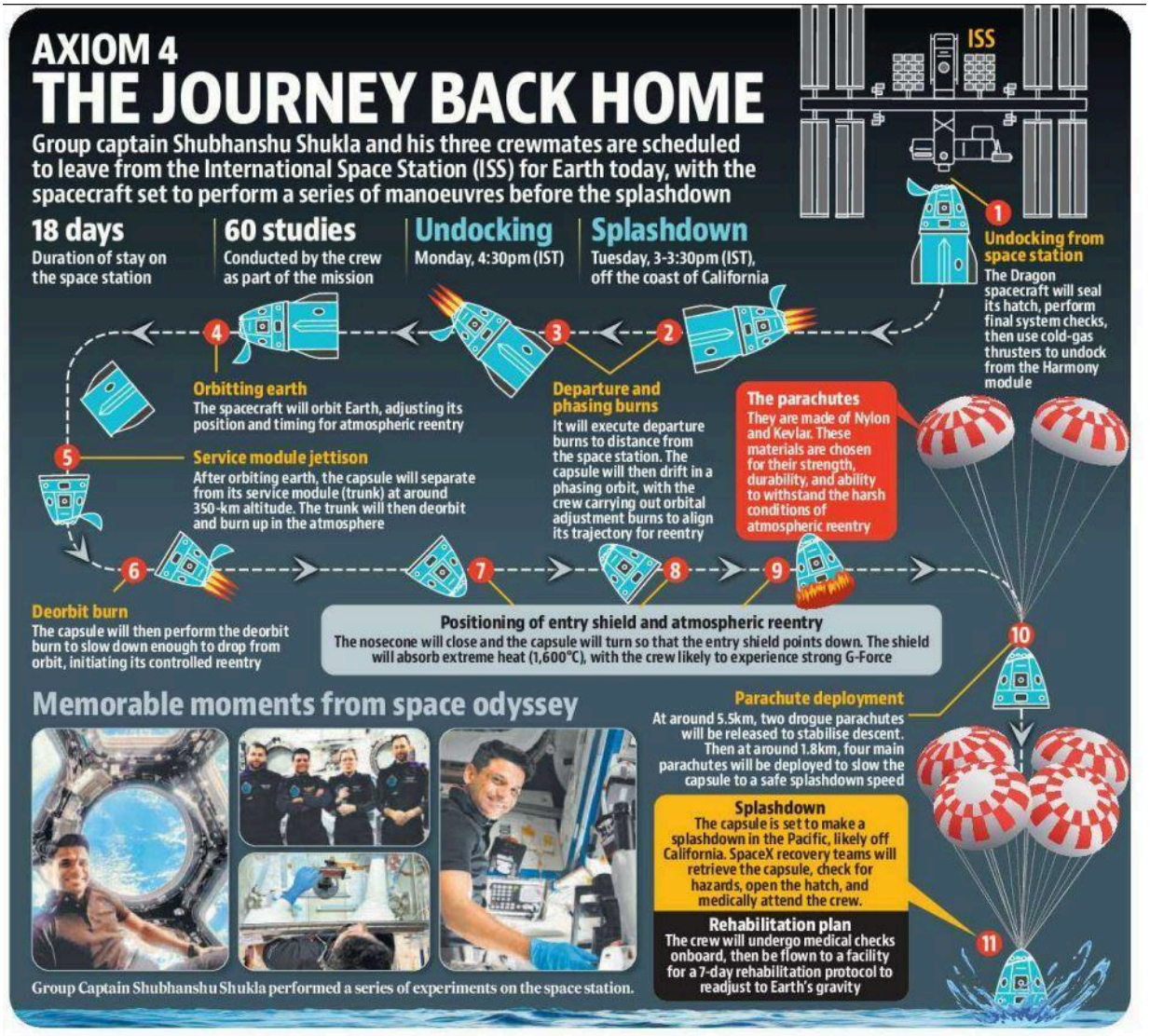

Source: The Hindustan Times Newspaper, 14-07-2025
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Link: https://drive.google.com/file/d/1w1BsbsydpaQXqC6kftDhF6GGdAwz_zTc/view

Shukla is coming home; capsule to undock today

According to Axiom Space, the Crew Dragon is expected to splash down off the coast of California on Tuesday at 3:00 p.m. IST

MUSKAN BHATIA
NEW DELHI, 13 JULY

After more than two weeks aboard the International Space Station (ISS), Indian astronaut Shubanshu Shukla is heading home, with science samples in tow and a suitcase full of memories.

On Sunday, Shukla and his Axiom-4 crew will begin packing up experiments and personal items into SpaceX's Dragon capsule for their return to Earth, NASA said in a statement.

Updating the mission status for the return journey, NASA said on Friday that mission managers have given the "go" for the Axiom Mission 4 (Ax-4) crew to board the SpaceX Dragon spacecraft and undock from the ISS. The spacecraft is scheduled to undock from the space-facing port of the Harmony module at 4:35 p.m. IST on Monday, 14 July. According to Axiom Space, the Crew Dragon is expected to splash down off the coast of California on 15 July 2025, at 3:00 p.m. IST, following a series of orbital maneuvers.

In a press statement, the Indian Space Research Organisation (ISRO) said after splashdown, Gaganyatri Shubanshu Shukla will undergo a week-long rehabilitation programme under the supervision of flight surgeons to help him readjust to Earth's gravity.

The Axiom-4 mission, piloted by Group Captain Shukla and carrying veteran astronaut Peggy Whitson, European mission specialists Slawosz Uznanski-Wi niewski (Poland) and Tibor Kapu (Hungary), reached the ISS on 26 June.

Aboard the space station, Shubanshu Shukla conducted a range of scientific experiments — from space farming to muscle regeneration.

On Friday, ISRO shared an update on the status of seven microgravity experiments carried out as part of India's participation in the Axiom-4 mission. Completed experiments include survival studies on Indian tardigrades, the effects of the space environment on muscle loss, the growth of methi and moong seeds, and a cyanobacteria-based study aimed at developing life support systems.

The remaining three – involving microalgae, crop seeds, and the Voyager Display experiment – are nearing completion, ISRO said in a statement.

These microgravity experiments – and the insights gained by Shukla during the mission – will contribute to India's future space endeavours, including the development of the Bharatiya Antariksh Station (BAS), planned for the early 2030s, and Chandrayaan-4, the country's first human mission to the Moon, targeted for 2047.

Source: The Statesman Newspaper, 14-07-2025
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