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*The Indian EXPRESS

WEDNESDAY, JULY 16, 2025, NEW DELHI, LATE CITY, 24 PAGES

JOURNALISM OF COURAGE

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Back on Earth

Shukla & team return; he has inspired a billion dreams, says PM



ANONNA DUTT NEW DELHI, JULY 15

ONLY THE second Indian to travel to space, and the first from the country to visit the International Space Station (ISS), Group Captain Shubhanshu Shukla returned to Earth on Tuesday, after a 20-day landmark space journey that prepares the ground for India's own human spaceflight mission, Gaganyaan.

Assisted by two people, and with a broad smile on his face, Shukla emerged from the space capsule, getting his first feel of Earth in almost three weeks **CONTINUED ON PAGE 4**

EXPLAINED

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Shubhanshu Shukla exits the spacecraft that carried him and other Axiom-4 crew members back from the ISS, Tuesday. (Top left) After the splashdown off the California coast. PTI

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External Affairs Minister S Jaishankar meets Chinese President Xi Jinping in Beijing, Tuesday. PTI

Jaishankar meets Xi, reminds SCO of need to combat terror, separatism

Raises Pahalgam attack, says it was done to sow religious divide in India

SHUBHAJIT ROY

NEW DELHI, JULY 15

IN HIS first visit to China since the start of the military standoff between Chinese and Indian troops along the Line of Actual Control in eastern Ladakh in 2020, External Affairs Minister S Jaishankar met President Xi Jinping in Beijing Tuesday and apprised him of the "recent development" in bilateral ties — the two countries have begun taking steps to repair relations.

In a post on X after meeting Xi, Jaishankar, who is attending a gathering of Foreign Ministers of the Shanghai Cooperation Organisation in Tianjin, said, "Called on President Xi Jinping this morning in Beijing along with my fellow SCO Foreign



IN THE months after the disengagement of troops in eastern Ladakh, India and China have sought to repair ties. The resumption of the Mansarovar Yatra and discussions to restore direct flights are pointers to the efforts.

Ministers. Conveyed the greet ings of President Droupadi Murmu & Prime Minister Narendra Modi. Apprised President Xi of the recent development of our bilateral ties.

CONTINUED ON PAGE 4

• Jaishankar meets Xi in Beijing

Value the guidance of our leaders in that regard."

Speaking at the meeting of the Foreign Ministers, Jaishankar said the SCO was founded to combat the "three evils" of "terrorism, separatism and extremism", and it was imperative for the SCO to take an "uncompromising position on this challenge".

"The three evils that SCO was founded to combat were terrorism, separatism and extremism. Not surprisingly, they often occur together. Recently, we in India witnessed a graphic example in the terrorist attack in Pahalgam on 22 April 2025. It was deliberately conducted to undermine the tourism economy of Jammu and Kashmir, while sowing a religious divide. The UN Security Council, of which some of us are currently members, issued a statement that condemned it in the strongest terms and 'underlined the need to hold perpetrators, organizers, financiers and sponsors of this reprehensible act of terrorism accountable and bring them to justice'. We have since done exactly that and will continue doing so. It is imperative that the SCO, to remain true to its founding objectives, take an uncompromising position on this challenge," he said, referring to Operation

Sindoor.

"We meet at a time of considerable disorder in the international system. In the last few years, we have seen more conflicts, competition and coercion. Economic instability is also visibly on the rise. The challenge before us is to stabilize the global order, de-risk various dimensions and through it all, address longstanding challenges that threaten our collective interests" he said

ests," he said. India, he said, has taken several initiatives in the SCO in domains ranging from startup and innovation to traditional medicine and digital public infrastructure. "We will continue to positively approach new ideas and proposals that are genuinely for our collective good. It is essential that such cooperation is based on mutual respect, sovereign equality and in accordance with territorial integrity and sovereignty of member states," he said, in an oblique reference to China.

AXinhua report quoted Xi saying China is "committed to making the organization more substantive and stronger, safeguarding regional security and stability, promoting the development and prosperity of member states". He said he hoped to meet the leaders of other member states at the Summit in Tianjin later this year.

FROM PAGE ONE

FULL REPORTS ON WWW.INDIANEXPRESS.COM

• Back on Earth: Shukla, team return

with a few tentative steps.

Exactly 50 minutes earlier, the space capsule, named Grace, carrying Shukla, Peggy Whitson from the US, Slawosz Uznanski-Wisniewski of Poland and Tibor Kapu of Hungary, had splashed down in the cold waters of the Pacific Ocean, off the coast of California.

After detaching from the ISS on Monday afternoon, the spacecraft took about 20 hours to reach Earth. On its way, it made another few rounds of the Earth, giving the astronauts some more opportunities to view it from space. During their 18-day stay on the ISS, the astronauts completed 288 revolutions of the Earth.

After the splashdown, which happened at about 3 pm India time (2.30 am Tuesday in California), the spacecraft was towed by ropes to a waiting ship, before being lifted by cranes and placed on the ship deck. There, one by one, the astronauts were helped out, as they felt the weight of their bodies for the first time since their journey to space on the Axiom-4 mission on June 25. Whitson was the first to come out, followed by Shukla, and the two others.

After the 20-day stay in microgravity conditions in space, their bodies need time to get accustomed to Earth once again. They required assistance in being pulled out of the space capsule, in standing up on their feet, and in walking.

The first thing they did after coming out of the space capsule was to undergo a health check by a waiting team of doctors on the ship. Shortly thereafter, the astronauts were airlifted by a helicopter to the NASA Space Center in Houston, where they will spend the next few days, resting and recovering, and briefing the Axiom Space, NASA and other teams on the journey, and the experiments that they carried out in space.

Throughout this period, their health parameters will be monitored constantly. Astronauts usually take a few days to about a week to regain normalcy after their return from space.

Congratulating everyone involved in the mission, President Droupadi Murmu said in a post on X: "A hearty welcome to Group Captain Shubhanshu Shukla as he comes back on Earth after his space journey. His role in piloting of Axiom Mission 4 to the International Space Station has created a new milestone for India's space exploration as well as for international collaboration in science and technology."

hnology." Prime Minister Narendra Modi said Shukla had inspired a billion dreams. "As India's first astronaut to have visited International Space Station, he has inspired a billion dreams through his dedication, courage and pioneering spirit. It marks another milestone towards our own Human Space Flight Mission — Gaganyaan," he said

"He has not just touched space, he has lifted India's aspirations to new heights. His journey to the International Space Station and back is not just a personal milestone; it is a proud stride for India's growing space ambitions," Defence Minister

Rajnath Singh said on X.

"Bharat today finds an enduring space in the world of Space," said Science Minister Jitendra Singh, who is also the minister in charge of Space.

Axiom-4 mission was a commercial human spaceflight journey to the ISS, managed by Axiom Space, a private US company, and facilitated by US space agency NASA. The rocket and spacecraft used for the mission came from SpaceX, the world's largest private space corporation.

The participation of Shukla—a fighter pilot with the Indian Air Force who was selected as one of the four astronauts for Gaganyaan—in the Axiom-4 mission was the result of a strategic partnership forged between NASA and the Indian Space Research Organisation (ISRO) in 2023. Through the Gaganyaan programme, India is hoping to send its first crewed mission to space by 2027.

The Axiom-4 mission provided ISRO an opportunity to gain some first-hand experience in human spaceflight missions ahead of the Gaganyaan launch. The knowledge and experience gained during Shukla's space journey — 41 years after Rakesh Sharma travelled to space on the then Soviet Union's Soyuz T-11 spacecraft — would be invaluable for ISRO as well as other astronauts who go on future missions.

ISRO had also designed several experiments for the Axiom-4 mission that would further its space research activities. Shukla carried out those experiments and participated in several others as well.

The Axiom-4 mission not only carried one of the largest number of scientific experiments – 60 experiments representing 31 countries — but it also represented the return of astronauts from three countries, India, Hungary and Poland, back in space after four decades. This is why the mission was themed "Realise the Return".

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THE INDIAN EXPRESS, WEDNESDAY, JULY 16, 2025

GOVT & POLITICS

2nd GE engine arrives, 12 LCA Tejas set to roll out by year-end

AMRITA NAYAK DUTTANEW DELHI, JULY 15

TWELVE TEJAS Mk 1A light combat aircraft, powered by the GE F404 engine from US defence major GE Aerospace, will be ready for rollout by December this year, and six of these aircraft have already been lined up, officials privy to the latest developments have told *The Indian Express*.

The second GE F404 engine, officials said, landed in India Monday and will be taken to the Bengaluru facility of HAL where it will be integrated with the indigenous Tejas Mk 1A.

In August 2021, HAL placed an order worth ₹5,375 crore for 99 F404 engines with GE Aerospace to power the Tejas Mk-1A. The first engine was delivered to HAL in April this year after considerable delay — the scheduled delivery date was in 2023.

The IAF has placed an order

The Ministry of Defence is also in the process of procuring another 97 Mk 1A LCAs at an estimated cost of ₹67,000 crore.

Officials said that GE Aerospace has said it will deliver

to procure 83 Tejas Mk 1A LCA.

10 engines by the end of this year.

"It takes about a month to integrate the engines and do the tests. The process first involves building the fuselage, then getting the lobing and piping done, followed by combining the land-

ing gear," an official said.

"After integrating the engines, the ground runs, including high-speed runs, are carried out for all thorough checks," the official said.

The deliveries of the LCA Tejas Mk 1A were scheduled to begin in March 2024, but have been delayed by over a year.

Last month, HAL Chairperson and MD D K Sunil attributed the delay to GE Aerospace missing the deadline to supply the aircraft engines to HAL for the Tejas Mk 1A.

The development came

The IAF's urgency

OPERATING WAY below its authorised strength of 42 fighter squadrons, the IAF is seeking timely delivery of the indigenous Tejas Mk 1A. It has already phased out most of its MiG-21 squadrons and in the coming years, it will begin phasing out other ageing fighter squadrons.

weeks after IAF chief Air Chief Marshal A P Singh expressed concern over the delay in delivery of the fighter aircraft.

The timely induction of the indigenous fighter jets, including Tejas Mk 1A, is crucial to hold the IAF's dwindling squadron strength. The IAF has phased out most of its MiG-21 squadrons, and early next decade, it is likely to begin phasing out other ageing fighter squadrons.

According to officials, HAL

According to officials, HAL plans to produce 16 fighter aircraft next year if engine deliveries from the US are on schedule. The original plan was to produce 16 aircraft every year and complete deliveries of all aircraft by 2030.

The Tejas Mk 1 A LCAs have multiple upgrades over the Mk 1 version, including integration of the AESA radar, Advanced Electronic Warfare Suite with jammer, and Beyond Visual Range (BVR) capabilities with integration of the Derby and the indigenous ASTRA air-to-air missiles.

Officials said testing of the ASTRA missile firing from the aircraft is currently underway.

Earlier this month, Defence Minister Rajnath Singh asked US Secretary of Defense Pete Hegseth to expedite the deliveries of GE F404 engines for the Tejas Mk 1A. BILL OF DISTRACTION

Punjab's proposed sacrilege law could push the state back into a

precarious debate that had receded into the background

receded into the background. In 2015, the Bargari sacrilege incident followed by police firing

that killed two protesters, and a chain of "beadbi" cases, had set the state on edge. It became

a flashpoint, and a potent symbol of the growing disillusionment with the then-ruling Akali-

BJP alliance, which had been in power for an unprecedented two successive terms since 2007.

Congress, which succeeded the Akalis, tried to ride that wave by pushing for a sacrilege law, capitalising on the issue's emotional resonance. This period also witnessed the meteoric

rise of the Aam Aadmi Party, which played the "outsider" card and swept the 2022 Punjab Assembly elections. The AAP's victory was less a testament to the party's popularity, given that it had never been tested in the state, than a collective indictment of legacy parties that had persistently failed to meet the people's aspirations. Sacrilege, by then, had become a non-is-

sue. Voters said they were weary of hollow promises about smooth roads and clean drains. It is troubling that the AAP, which appears to have shifted gears after its electoral setback in Delhi, should now choose to steer Punjab back towards the volatile terrain of sac-

rilege. In 2015, such incidents carried a discernible political undertone, and suspicions were trained on the role of the Dera Sacha Sauda. But in the years since, the sporadic

episodes have increasingly appeared to be individual acts of crime rather than politically

orchestrated. There is no denying that sacrilege wounds deeply as it strikes at the core of

faith. But for a border state grappling with economic, social, and security challenges, the

reintroduction of this emotionally charged issue into the political discourse is a cause for

concern. Punjab's agricultural sector flounders in the absence of diversification. Despite

handwringing over depleting groundwater, the state still pushes paddy cultivation to

new highs. Land pooling for real estate is fuelling new tensions in a state struggling to

transition from an agrarian economy to one led by manufacturing. The drug menace con-

tinues to kill and the law-and-order situation teeters on the edge. This bill can only be

read as an attempt to stoke emotions and consolidate votes in the extended run-up to

the 2027 Assembly elections. At a time when Punjab needs to focus on rebuilding its

economy, and restoring public trust, it's a dangerous distraction.

The public mood was already souring; Bargari crystallised the anger.

HE PUNJAB GOVERNMENT'S bill proposing life imprisonment and a fine of up

to Rs 10 lakh for the desecration of any religious text — sent to a Select Committee

- is deeply problematic. The existing laws address the crime, there was no need

for a separate piece of legislation. It pushes the state back into a debate that had

THE EDITORIAL PAGE

Hedging against America



Trump 2.0 is upending US ties with allies and partners in Asia and Europe. De-coupling may be hard, de-risking is necessary

C Raja Mohan

SECTIONS OF THE Indian foreign policy community feel "betrayed" by the Donald Trump administration, which has found unexpected affection for Rawalpindi, raised a host of tough demands on trade, and threatened additional tariffs on India because of its BRICS membership and continued purchase of Russian oil. It is, perhaps, a small consolation that India is not alone. America's neighbours and largest trading partners (Mexico and Canada) and its longstanding allies in Europe and Asia have even more reasons to feel betrayed.

Most of these alliances date back to the end of World War II and have weathered multiple crises over the past eight decades. But as in life, so in international relations — nothing is forever. If change is the only constant, that moment of restructuring has now arrived for America's alliances and partnerships in Europe and Asia. As a non-ally, India is better prepared for change in America.

The idea of "strategic autonomy", long central to India's foreign policy, has been viewed with scepticism by India's Western partners. They have argued that India's near obsession with autonomy limits the scope for strategic cooperation with the US and Europe. But today, "strategic autonomy" has become the new mantra among America's allies themselves.

In his address to the British Parliament last week, French President Emmanuel Macron reflected on the implications of the unprecedented disruption unleashed by President Trump's second term. He underlined the need for deeper Franco-British cooperation to reduce what he called the "dual dependency" on the US and China. Macron warned against Europe's excessive reliance on the two superpowers for economic, technological, and security needs, and emphasised the urgency of reclaiming European strategic autonomy. He called for stronger Franco-British collaboration on defence, climate action, migration and technological innovation, suggesting that only through unity can Europe effectively respond to global challenges and safeguard its interests.

Although America's European allies bent over backwards to placate "daddy" Trump at the NATO summit last month, they are shocked by the Trump administration's policies. If there were any lingering doubts, Trump dispelled them over the weekend by imposing a 30 per cent tariff on imports from the European Union, shattering hopes for compromise on trade. Trump has long regarded the EU as a bigger economic threat than China but few anticipated that transatlantic ties would deteriorate The frustration among allies does not mean they can simply walk away from Washington. All America's partners have enormous stakes in sustaining their economic and technological ties with the US. Even more important, their security challenges would become far

more demanding without American guarantees. If Europe must find new ways to defend itself against Russia, Asian allies must devise strategies to cope with Chinese power. America's Eurasian partners will not simply fold their hands they will search for creative answers. In Europe, France and Britain are discussing

better coordination of their

while the EU is accelerating

nuclear weapons policies,

collective defence efforts.

so sharply in his second term.

Britain's Prime Minister, Keir Starmer, may lack the rhetorical flair of his French counterpart but he, too, is seeking to rebalance the "special relationship" with the US against the geographic imperative of Europe. If Brexit a decade ago was about distancing from Europe and reconnecting with the Anglosphere, Starmer's Labour government is working to rebuild links with the Continent. Trump, despite his family origins in the UK, has little affection for Britain. His MAGA coalition looks down on its "poorer cousins" in the British Isles.

The story is no different in Asia, where two of America's staunchest allies are seething over Trump's actions. The announcement of 25 per cent tariffs on Japanese imports triggered rare outrage within Japan's political class, which has placed nearly all its strategic bets on the US since World War II. It was remarkable, therefore, to hear the Japanese PM declare that Tokyo must reduce its dependence on Washington. He made it clear that Japan would not offer "easy concessions" or compromise its national interests in the face of US pressure.

To be sure, Prime Minister Shigeru Ishiba is in the midst of an upper house election campaign this week. But this is not mere campaign rhetoric. He stressed that Japan, as the largest foreign investor in the US and a major creator of American jobs, deserves different treatment from countries targeted by the tariffs. Despite months of negotiations, repeated diplomatic missions to Washington, and a pledge of \$1 trillion in new investment, Ishiba's government could not persuade Trump to hold back, especially as the US President remained dissatisfied with Japan's market access for American rice and automobiles.

Equally emphatic about strategic autonomy has been Australian Prime Minister Anthony Albanese. Few countries have been as close to Washington as Australia. Yet, in a major speech last week, Albanese insisted that being an ally does not mean being a blind follower. He described the US alliance as a "pillar" of Australian foreign policy but argued that this partnership should not constrain Australia's sovereignty or decision-making. He called for an "Australia first" approach particularly relevant amid intensifying US-China rivalry in the Indo-Pacific. As it happens, Albanese is in China this week, stepping up efforts to engage Australia's Asian neighbours.

The frustration among allies does not mean they can simply walk away from Washington. All America's partners have enormous stakes in sustaining their economic and technological ties with the US. Even more important, their security challenges would become far more demanding without American guarantees. If Europe must find new ways to defend itself against Russia, Asian allies must devise strategies to cope with Chinese power. America's Eurasian partners will not simply fold their hands — they will search for creative answers. In Europe, France and Britain are discussing better coordination of their nuclear weapons policies, while the EU is accelerat-

ing collective defence efforts. In Asia, the challenge is harder. Unlike in Europe, regional institutions remain underdeveloped, and the gap between China's power and that of its neighbours is vast. Yet, the logic of diversification is undeniable. We are already seeing Asian allies doing more with each other and engaging other actors such as the EU. Some are beginning to reassess their engagement with China.

At the same time, the depth of the US relationship is such that preventing a slide into outright rupture remains a top priority for allies in both Asia and Europe. As Macron told the British Parliament, Europe does not want to walk away from the US — but it must "derisk" ties by finding new partners and rebuilding its own capacities.

India, for its part, is holding its nerve and continuing to engage Washington. As Delhi weighs the consequences of the Trump upheaval for Eurasia and the global order, it is worth recalling that India has managed many strategic surprises before: The Chinese "betrayal" in 1962, Beijing's embrace of Pakistan, the Sino-Soviet split, the US-China entente in the 1970s, the Soviet collapse in 1991, the rise of a new economic order in the 1990s, and the Russia-China alignment in the 2000s.

If external change is inevitable, Delhi's focus must be on managing it rather than bemoaning it. For now, India remains one of the few major US trade partners not yet notified of a new tariff level. Delhi has resumed trade talks with Washington this week and is eager to conclude one of its most ambitious negotiations before the August 1 deadline. But it must be prepared for failure. As Trump might remind us, the golden rule of any negotiation is the will to walk away.

The writer is distinguished fellow at the Council for Strategic and Defence Research, Delhi, and contributing editor on international affairs for The Indian Express



IN A GREATER SPACE

Shubhanshu Shukla's mission, safe return will provide valuable inputs to Gaganyaan

B R GURUPRASAD

"THE SECOND INDIAN in space", Group Captain Shubhanshu Shukla's return journey to terra firma was safely and successfully accomplished on July 15. Shukla is back after a fruitful stay of about 18 days on the International Space Station (ISS). A day before his return, the Crew Dragon spacecraft Grace in which he comfortably sat with his three Axiom 4 colleagues successfully undocked (detached) from the ISS, circling the Earth at 400 km height. For the next 22 hours or so, the craft independently orbited the Earth and then dived back into the atmosphere, survived the subsequent fiery re-entry heat and splashed down off the coast of California at a comfortable speed of about 24 km per hour. With this, Shukla's maiden sojourn in space concluded.

Understandably, the successful completion of Shukla's Axiom 4 mission will make an already joyous India more euphoric for quite some time. Many among our hundreds of millions of strong, intelligent and capable students will consider Shukla a role model. Shukla has said that India's first space traveller, Rakesh Sharma, was a role model for him.

The sense of excitement associated with spaceflight, especially human spaceflight, and the inspiration it can provide are immense. It

The participation of one of its astronaut candidates in Axiom 4 will enrich Gaganyaan in terms of planning and execution. Shukla was extensively trained in many US facilities, including at NASA, for about eight months. Fairly detailed knowledge of such facilities as well as the training procedures would not have been available to us without the participation in a human spaceflight mission.

can effectively empower students to pursue STEM education with seriousness. This is one of the prominent benefits to accrue from Shukla's worthwhile journey to space.

Having many significant achievements to its credit in the arena of uncrewed spaceflight, India is confidently taking its first step into human spaceflight. Gaganyaan aims to launch Indian space travellers from Indian soil, in an Indian-built spacecraft, propelled by an Indian launch vehicle, and make them orbit the Earth for a few days. Serious and systematic efforts are being led by ISRO, with the enthusiastic participation of many national scientific/technological institutions of repute.

As part of this arduous endeavour, the human rating (significantly enhancing the reliability of a rocket vehicle to safely launch human beings) of India's most capable launch vehicle, HLVM3, has reportedly been completed. The design and development of the Gaganyaan spacecraft, which will be capable of accommodating three space travellers, is in progress. Prashanth Balakrishnan Nair, Ajit Krishnan, Angad Pratap and Shukla, all test pilots now holding the rank of group captain in the Indian Air Force, have been selected and trained in India and Russia.

The participation of one of its astronaut

candidates in Axiom 4 will enrich Gaganyaan in terms of planning and execution. Shukla was extensively trained in many US facilities, including at NASA, for about eight months. Fairly detailed knowledge of such facilities as well as the training procedures would not have been available to us without the partic-

ipation in a human spaceflight mission. Thus, not only has Shukla been trained for the launch, he also now has first-hand experience of travelling in a spacecraft to Earth orbit. More importantly, he has gained invaluable experience of living and working in the weightless environment of space aboard the ISS. That he was able to perform the carefully designed and packaged bio-medical, health care, space food production and cognitive science-related experiments from India has greatly encouraged our scientific and engineering community and enhanced our confidence and atmanirbharta. Thus, India's participation in the Axiom 4 mission is beneficial in many ways indeed.

The writer is director, Jawaharlal Nehru Planetarium, Bengaluru, adjunct faculty, National Institute of Advanced Studies and former associate director, ISRO. Views are personal

THE IDEAS PAGE

A common thread of exclusion

In both the SIR in Bihar and language politics in Maharashtra, the migrant worker is alienated, disenfranchised



Anisha George

THE PRESENT POLITICAL moment in India is another demonstration of the now routine politics of alienation and exclusion. On the one hand, the Election Commission has announced a revision of the voter list in Bihar, requiring elaborate paperwork that effectively stands to exclude millions of poor migrant workers spread across the country. On the other hand, multiple parties have made a great show over the language issue in Maharashtra, with poor migrant workers being vilified and made the primary target — many have recently been beaten up for not speaking Marathi. This is also a growing trend across southern states, where the opposition to Hindi imposition by the Centre has been countered by the imposition of state languages on precarious "outsiders". Such disenfranchisement of the mobile poor in both origin and destination states in India is a threat to their basic citizenship rights.

The language issue in India is an existential one. Who are we as a people? What is our identity as a nation? To many, a singular language is indispensable to national identity/unity. To others, unity lies in diversity. Strikingly, both parties are caught in tangles when it comes to poor migrant workers. These workers, predominantly hailing from the poorer and more populous northern and eastern parts of India, migrating to the west and south, are identified as linguistic/cultural others, if not inferiors, at migration destinations. This vastly heterogeneous demography is variously essentialised as bhaiya, Hindikara, vadakkan, Bangaligal, Bihari, etc. Their own rich and varied linguistic backgrounds are erased and reduced to Hindi, a language that may also be alien to them, but a gateway to traverse broad geographies in search of work. Hindi, for better or for worse, has become the language of the labour market today. Whether from the Northeast, Punjab or Telangana, workers are increasingly speaking some version of Hindi to get by; in the process, losing much of their own cultural identity and heritage.

States that insist on workers learning their respective state languages are seeking to extract cultural assimilation in exchange for economic citizenship. However, the latter is scarcely forthcoming. Workers barely manage to find steady

work in a single industry or city. Even if they do, their ability to build a life and livelihood in cities is further constrained by the costs of living that inhibit relocation with family and the lack of healthcare, food rations, and voting rights. It fails to provide them any form of social security or avenue for claims-making. Moreover, at the slightest sign of distress in cities — remember Covid — migrants are pushed out without the slightest remorse. When destination states have nothing but irregular work at low wage rates to offer such immigrants, what is the moral, let alone constitutional, basis of demanding such cultural assimilation?

The political rights of labouring immigrants are an even more fraught subject India seems to have squandered its demographic dividend by failing to provide quality education, employment or social security to its youth. As a result, we have a large mass of "footloose labour" wandering the breadth of the country for work. Further, imbalanced regional development in the country has meant that the historically better-off regions have continued to flourish at the peril of others. For instance, despite being a high-remittance (domestic/international) state, Bihar has one of the lowest credit-to-deposit ratios in the country. More generally, the agrarian crisis and India's jobless growth have served to push the working poor into the vast informal sector, which fails to provide any security of work or pay.

Those who provide this cheap labour, then, are readily characterised as "economic predators" by destination states to cover up their own failings in reining in market players and generating decent employment for the masses in general. State politicians mobilise such ethnolinguistic solidarities to paper over deeprooted intra-state tensions of class and caste. The immigrant outsider, evidently nobody's constituency, is an easy political target for dehumanisation. Politicians everywhere oppose the extension of urban housing and voting rights to poor immigrants and try to restrict citizenship claims to their points of origin. However, if more origin states undertake moves like Bihar, immigrants' political rights back home also stand threatened.

This disenfranchisement of poor immigrants comes at a time when the country is yet to recover from the post-pandemic recession fully, and workers are yet to resume pre-pandemic levels of migration. While the loss of workers is perilous to destination states (and to economic growth), the loss of migration avenues is even more detrimental to workers (and to poverty reduction). Parties preying on the poor are against both democracy and politics.

The writer teaches at Azim Premji University, Bengaluru. Views are personal



The work of decolonisation

A relook is needed at the functioning of all the agencies working on monuments

TARUN VIJAY

"The history of India is not just about slavery. The history of India is about emerging victorious... The mistake of not keeping those events in the mainstream is being rectified now" — **Narendra Modi**

PUTTING THE MARATHA Military Landscapes on the UNESCO World Heritage list is a significant step towards recognising Indian monuments of victory and glory and decolonising the heritage space. The momentum must be taken further as this area had been neglected for a long time post-Independence.

Monuments are our collective memory etched in stone. After Independence, there was little effort to correct the mindset of teachers and those preparing history books. The colonial mindset continued even in the preservation of monuments and archaeological sites. Teaching took place under the shadow of what PM Modi has called the history of our defeat and the stories of enemies' victories.

It is only under the Modi government that the decolonisation drive has begun, giving us new insights into the history that the British and the Left cabal sought to bury. It has highlighted the stories of King Suheldev, Rani Durgavati and Lachit Barphukan. The founderking of Delhi, Maharaja Anangpal Tomar, was long ignored — now, Anang Tal, which was a neglected sewer reservoir, has been designated a Monument of National Importance. Excavations at Rakhigarhi have restarted. The Navy has new insignia inspired by Chhatrapati

Shivaii. There have also been efforts to delve into the history of tribal communities' wars of independence in the Northeast, specifically the Tai-Khamti War (1839). These are just a few examples of the Modi government's vision of resurrecting India's glorious history and detoxing colonised minds.

As chairman of the National Monuments Authority (NMA), I had an opportunity to flag some anomalies and suggest changes in the way we look at preservation. We have created a list of 3,695 Monuments of National Importance that have brought out interesting facets of Indian history.

Afzal Khan, the cruel general serving the Adil Shahi dynasty of Bijapur, believed a prophecy about his death before his "meeting" with Shivaji. Some tales suggest that he killed his many wives the night before he departed to encounter his foe. We know Shivaji killed him. But the graves of his wives are now a Monument of National Importance in Bijapur. Maharani Tarabai Bhonsle fought the Mughals and ruled as a Maratha queen for 30 years. But her samadhi is in ruins in Satara. It deserves the honour of being a Monument of National Importance.

The great Sikh warrior Baba Baghel Singh conquered Delhi in 1783, made the Mughal emperor pay fines and constructed seven gurdwaras including Sis Gani Sahib. His 30,000 Sikh soldiers camped near the Red Fort — and so, the camp became known as Tis Hazari. But nowhere, even in the Red Fort Museum, is there any mention of this conquest. The National Monuments Authority was asked to approach the Tis Hazari court to ask if it would like to have the name explained in its precincts.

The Marathas conquered Delhi in 1757 under Raghunath Rao and in 1771 under Mahadaji Shinde. They controlled the Red Fort and continued to rule until 1803, when the British overpowered them in the second Anglo-Maratha War. The British took Delhi from the Marathas and not the Mughals. This fact, too, is completely missing from the Red Fort museum. The NMA struggled for two years to have this mentioned on a wall of honour inside the fort without any success.

On the Delhi-Meerut highway, there lies a nondescript grave of British soldiers who were killed by local revolutionaries in 1857. This was declared a Monument of National Importance. But the Kali Paltan Augharnath temple, Meerut, a renowned place that housed revolutionaries and Purabia soldiers — a shelter for the marching armies of the freedom struggle – has been refused the honour.

There isn't a single Monument of National Importance connected with the Dalit struggle and B R Ambedkar's life. His first primary school in Satara and the Sayaji Baug Vadodara Banyan tree, where he resolved to bring equality for all Indians, now known as Sankalp Bhumi, have yet to be accepted as national monuments.

After a detailed site inspection by the NMA, the Governor of Kerala sent a recommendation to declare the birthplace of Adi Shankara, Kalady, a Monument of National

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Importance. It was not even responded to.

Mangarh has been a place of the greatest reverence for PM Modi. He visited the place many times before he became Gujarat CM, and recently, as PM. The NMA visited the site and recommended that it be declared a Monument of National Importance. It was the site of the massacre of more than 1,500 Bhil tribals by the British army in November 1913.

We are still waiting for action on the matter. There are more than 100 monuments like Tota-Maina Ki Kabr that have absolutely no history. Nobody knows what they represent and why they have been declared Monuments of National Importance. Similarly, some Monuments of National Importance, like the Mohammad Gauri Ke Senapati Ki Chhatri and Babur Ka Bagicha (where he is said to have stayed for a few hours), defy any logic. Not a single Monument of National Importance from Kashmir, like Martand, Parihaspore or Harwan, was ever recommended to be declared a UNESCO World Heritage Site, and none has been given even a security guard.

I had recommended a relook at the functioning and mandates of all the agencies working on monuments to unshackle them from the colonial mindset. We need an Archaeological Foundation to preserve civilisational and revolutionary monuments of India.

> The writer was chairman, National Monuments Authority

ECONOMY

SENSEX: 82,570.91 ▲ 317.45 (0.39%) NIFTY: 25,195.80 ▲ 113.50 (0.45%) NIKKEI: 39,678.02 ▲ 218.40 HANG SENG: 24,590

'NEGOTIATIONS BASED ON TERMS OF REFERENCE DECIDED IN APRIL'

Wider US tariffs off the table in trade talks for now, says official

RAVI DUTTA MISHRA

NEW DELHI, JULY 15

WHILE RELIEF on US reciprocal tariffs is among the key demands from Indian negotiators in exchange for opening up the Indian market to American goods, wider US tariffs — such as those on metals, a likely duty on BRICS countries, and on buyers of Russian oil— are not part of the ongoing trade negotiations with the US yet, an official said on Tuesday.

"As of now, India and the US are negotiating on the basis of the terms of reference (ToR) that were finalised [in April]," the official said responding to a question on whether wider US tariffs are part of the negotiations. The official added that the negotiations will continue with the US and the goal remains a bilateral trade agree-

ment (BTA) by the year end. The official said that, currently, only US baseline tariffs of 10 per cent and sectoral tariffs on steel and aluminium—along with fentanyl-related tariffs on China have come into effect. "These have resulted in higher duty collections for the US, and their imports from China and specific sectors have gone down," the official said.

This assumes significance as

NEGOTIATIONS WITH AMERICA TO CONTINUE

THE OFFICIAL added that the negotiations will continue with the US and the goal remains a BTA by the end of the year. The official said that, currently, only US baseline tariffs of 10 per cent and sectoral tariffs on steel and aluminium and fentanylrelated tariffs on China have come into effect.

TRUMP HAS threatened steep tariffs on BRICS countries over their challenge to the US dollar and has warned of duties on buyers of Russian oil

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

US President Donald Trump has continued to announce fresh tariffs on countries despite the US having trade deals with some of them, such as Canada and Mexico. While sectoral tariffs—such as

50 per cent on steel, aluminium and copper—are already disrupting India's exports to the US. Trump has also threatened steep tariffs on BRICS countries over their challenge to the US dollar and has warned of duties on buyers of Russian oil. Notably, India is a top importer of Russian oil.

Trade data shows that the US is India's third-largest copper export market, after Saudi Arabia (26 per cent) and China (18 per cent).

However, given copper's status as a critical mineral and its extensive use across infrastructure, energy and manufacturing, India's domestic industry is likely to absorb any decline in US demand resulting from the pro-

Exporters have said that US tariffs on steel have already impacted India's steel exports.

posed tariffs.

Earlier this month, Trump said that tariffs on pharmaceuticals could rise to 200 per cent after a vear. This is significant, as the US is India's largest overseas market for pharmaceuticals.

> **FULL REPORT ON** www.indianexpress.com

India, EU close 7 out of 23 chapters in trade deal

RAVIDUTTA MISHRA NEW DELHI, JULY 15

AS TRADE negotiations pick up pace amid US tariff threats, India and the EU have managed to close two more chapters in the latest round of talks and narrow gaps in services, a government official said on Tuesday. The two sides have now agreed on seven out of 23 chapters in the ongoing negotiations for what could be the largest trade agreement India has ever entered into.

L. Satya Srinivas, special secretary in the Department of Commerce, said the last (12th) round of talks concluded last week in Brussels. "We have exchanged our offers on services and non-services... there were discussions on that. We also discussed key interests in market access related to goods as well... The next round of talks (will be held) in the first week of September," Srinivas said. However, the Carbon Border Adjustment Mechanism (CBAM) is not part of the EU trade negotiations, Hervé Delphin, EU

Ambassador to India, told The Indian Express last month. "I have come to discover that CBAM is one of the best-known acronyms in India. First, CBAM is not a trade measure. It is not part of trade and the FTA. It's about compliance with our climate agenda to accelerate decarbonisation," he said.

On February 28, Prime Minister Narendra Modi and the European Commission President agreed to seal an FTA deal by year-end.

ASEAN deal

Special Secretary in the Department of Commerce Rajesh Agrawal said that the 10th and 11th rounds of talks are likely to be held in August here and in October in Malaysia. "We are engaged in the negotiations. Nine rounds of talks have been concluded so far... The progress so far has been chequered — not what it could have been — but the good part is that we are moving forward on many aspects, especially on customs and trade facilitation," Agrawal said. **FULL REPORT ON** www.indianexpress.com

RBI GOVERNOR SANJAY MALHOTRA

'If inflation moderates or growth weakens, policy rate can be cut'

HITESHVYAS MUMBAI, JULY 15

RESERVE BANK of India (RBI) Governor Sanjay Malhotra on Tuesday hinted that a further cut in the repo rate could be considered if inflation continues to remain benign or if there is pressure on growth.

The statement from the governor comes a day after consumer price index (CPI) of inflation slowed to a 77-month low of 2.1 per cent in June compared to 2.82 per cent in May. "The Monetary Policy Committee (MPC), as always, will factor in the evolving situation, the outlook and then, will take a call on what kind of a policy rate the economy needs. If the inflation is lower or the outlook (on inflation) is lower, or the growth is lower, certainly the policy rate can be cut. But that is something that we have to wait and watch," Malhotra told CNBC TV18 in an interview on Tuesday.

He was replying to a question on whether lower-than-expected



RBI Governor Sanjay Malhotra said FY26 inflation may be lower than 3.7%. Express File

inflation in FY26 opens up space for further rate cuts. The RBI's has projected inflation to be at 3.7 per cent in FY26. Malhotra said there was an expectation that inflation will not be 3.7 per cent, but lower than that. "That's certainly on the cards. And if that happens, the monetary policy will have a look at it and take a call," he said.

In the June policy, the RBI's sixmember MPC reduced the repo

rate by 50 basis points (bps) to 5.50 per cent. Since February 2025, the repo rate has been reduced by 100 bps. The MPC also decided to change the policy stance from accommodative to neutral. "We are in a neutral stance. This means that we can go in either direction. It gives us the flexibility to move upwards or downwards depending on what the outlook, more importantly, rather than the current data which we have now only for Q1, is going to look like, going ahead,' Malhotra said on Tuesday.

When asked which of the factors will trigger a rate cut, the governor said it will be a mix of the two: "One can't really say that it is inflation which is more important than growth numbers. For us, as you are aware, we primarily look at price stability, which is our core mandate, and then we look at growth also. Both are equally important and I would not say that we would give more emphasis, as of now, to either numbers," he said. **FULL REPORT ON**

www.indianexpress.com

June unemployment rate steady at 5.6%, but fewer people searched for jobs

SIDDHARTHUPASANI NEW DELHI, JULY 15

SEASONAL FACTORS again weighed on India's labour market in June as the unemployment rate remained unchanged at 5.6 per cent, although the Labour Force Participation Rate (LFPR) declined to 54.2 per cent in June from 54.8 per cent in May, suggesting fewer people looked for jobs last month.

According to the Statistics Ministry's latest monthly Periodic Labour Force Survey (PLFS) report, released on Tuesday, while the unemployment rate (UR) for Indians aged 15 years and above was flat month-on-month in June at 5.6 per cent, there was a marginal decline in UR to 5.6 per cent from 5.8 per cent in May for females, while that for males remained at 5.6 per cent.

The monthly jobs data is based on the Current Weekly Status (CWS) approach. Under this approach, the activity status of a person is measured for the seven days preceding the date of survey.

Although the headline unemployment number was steady, the figures for rural and urban areas moved in opposite directions. While rural unemployment declined by 20 basis points (bps) to 4.9 per cent in June, urban unemployment rose by 20 bps to 7.1 per cent for those aged 15 years and above.

According to the Ministry of Statistics and Programme Imple-

JUNE LABOUR MARKET DATA May June 54.8% All-India LFPR 54.2% 5.6% All-India 5.6% UR 63.1% Rural male LFPR for 15-29 62.0% 22.9% Rural female LFPR for 15-29 20.5% 14.0% Rural male **UR for 15-29** 13.8% **LFPR:** Labour Force Participation Rate, 13.0% Rural female **UR:** Unemployment **UR for 15-29** 13.7% Rate; Source: MoSPI

mentation (MoSPI), the decrease in the unemployment rate among rural males and females in June was due to a rise in share of ownaccount workers, with seasonal factors "prompting individuals to engage in small-scale or self-initiated activities" such as petty trade, repair work, or services.

Meanwhile, an increase in urban unemployment was particularly pronounced among the youth, with the jobless rate increasing to 18.8 per cent from 17.9 percent in May for those in the 15-29 years age bracket. Female youth unemployment rose by 140 bps to 25.8 per cent, while for

males the increase was 80 bps to 16.6 per cent. At an all-India level, vouth unemployment rose by 30 bps to 15.3 per cent in June.

Summer pangs

While the all-India unemployment rate was steady at 5.6 per cent after posting a 50 bps increase in May, the LFPR declined for the second month in a row for most segments of the population in rural and urban areas.

The biggest fall in LFPR was seen among young females in rural areas, for whom the ratio decreased by 240 bps to 20.5 per cent. The fall among males in ru-

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ral areas in the 15-29 years age bracket was approximately half that, at 110 bps, as their LFPR declined to 62.0 per cent. The decline seen in the Worker Population Ratio (WPR) was similar: at an all-India level, the WPR declined by 50 bps to 51.2 per cent.

The LFPR is the fraction of the population that is seeking or available for work, while the WPR is the percentage of employed persons in the population.

According to MoSPI, the fall in LFPR and WPR in June was "largely influenced by seasonal agricultural patterns, intense summer heat limiting outdoor physical work, and a shift of some unpaid helpers, particularly from higher-income rural households, towards domestic chores".

The June PLFS report is the third-ever monthly labour market data from the statistics ministry. Back in June, while detailing data for May, MoSPI had cautioned that a rise in the unemployment rate did not necessarily reflect "secular trends" as changes were to be expected in the monthly data on account of increased frequency of the survey and seasonal, academic, and labour market factors. A total of 3.8 lakh persons were surveyed by MoSPI in June, roughly the same as in April and May. As part of the revamped survey design for the PLFS, a rotational panel sampling design is being used.

FULL REPORT ON

www.indianexpress.com

BOTH COUNTRIES TO REVIEW TRADE AGREEMENT, EXPLORE DE-CARBONISATION

Despite Indo-Pacific, our window for talks open: Albanese after meeting Xi

LEWIS JACKSON & KIRSTY NEEDHAM BEIJING, SYDNEY, JULY 15

CHINA AND Australia will keep open dialogue and look for areas of cooperation despite strategic competition in the Indo Pacific region, Australia Prime Minister Anthony Albanese said on Tuesday after meeting China's President Xi Jinping in Beijing.

China was willing to "promote further development in the China-Australia relationship," Xi said in remarks at the start of the meeting. Albanese's visit to China comes as Beijing tries to capitalise on US President Donald Trump's sweeping trade tariffs by presenting itself as a stable and reliable partner.

Australia's trade relationship with China was separate to Canberra's handling of U.S. tariffs, Albanese told reporters, speaking after a lunch with Xi at the Great Hall of the People.

Albanese said a decade-old free trade agreement with China, Australia's largest trade partner, would be reviewed, and that the two leaders agreed to potential new cooperation on de-carbonisation. Albanese said he raised Australia's concerns over the



Australian PM Anthony Albanese with Chinese President Xi Jinping at Great Hall of the People in Beijing on Tuesday. AP

Chinese navy's conduct of short notice live fire exercises in the Tasman Sea between Australia and New Zealand in February.

Xi responded that China "engages in exercises just as Australia engages in exercises", Albanese told reporters.

"We have strategic competition in the region but we continue to engage in order to support peace and security in the region and stability in the region," he said.

Chinese state media outlet Xinhua said Xi emphasised in the meeting that China and Australia should continue to enhance strategic mutual trust, create a favourable business environment for both sides, and "safeguard multilateralism and free trade" in the face of a com-

plex international landscape. "Dialogue needs to be at the centre of our relationship," Albanese said in opening remarks to Xi.

China's military activities biggest challenge: Japan

ASSOCIATED PRESS TOKYO, JULY 15

JAPAN CAUTIONED against China's rapid acceleration of military activity stretching from its southwestern coasts to the Pacific, describing the moves in a new defense report Tuesday as the biggest strategic challenge.

China's growing military cooperation with Russia also poses serious security concerns to Japan, along with increasing tension around Taiwan and threats coming from North Korea, the Defense Ministry said in the annual report.

"The international society is in a new crisis era as it faces the biggest challenges since the end of World War II," the report said, citing significant changes to the global power balance while raising concerns about an escalation

of the China-U.S. rivalry. The security threats are concentrated in the Indo-Pacific, where Japan is located, and could get worse in the future, the report said. China's Foreign Ministry spokesperson Lin Jian criticized the white paper, saying it "adopts



A Chinese aircraft carrier in the South China Sea. AP

a wrongful perception of China, unjustifiably interferes in China's internal affairs, and plays up the so-called China threat."

Beijing has lodged protests with Japan, Lin said, defending China's military activities as "legitimate and reasonable." He urged Japan to reflect on its wartime past and "stop hyping tension in the region and Chinarelated issues as a pretext to justify its military buildup."

Japan has strengthened its military forces on southwestern islands in recent years and was preparing to deploy long-distance cruise missiles, as it worries about a conflict in Taiwan, which China claims as its territory to be annexed by force if necessary.

SAMI PEOPLE WERE OPPRESSED FOR CENTURIES BY THE POWERS THAT RULED AND EXPLOITED THEIR LANDS

A rap festival near the Arctic Ocean delights crowds under the midnight sun

HELISIVUNEN

UTSJOKI (FINLAND), JULY 15

ITWAS well past midnight when Mihkku Laiti appeared on stage to perform at an open-air music festival in the Finnish village of Utsjoki, north of the Arctic circle.

Despite the time, Lapland's famous midnight sun was still up. During the summer months the sun doesn't go down at all in Utsjoki, which is less than 50 kilometers (30 miles) from the Arctic Ocean.

In the glow of blue spotlights, Laiti rapped while a crowd of

more than 300 listened, some of them singing along and dancing. Like the majority of Utsjoki's residents, Laiti is a member of the Sami – Europe's only recognized Indigenous people — and he rapped in his native Sami language.

Laiti, also known by his stage name "Yungmiqu," is the founder of the Loktafeasta rap festival. He first found fame on the television show Talent Finland, where he surprised the judges by rapping in the gakti, the traditional dress of the Sami. It is brightly colored and often

characterised by plaits, pewter

embroidery and a high collar. The festival brought Laiti's

Indigenous culture to the spotlight, though some of his fans could not understand what he was saying. That didn't seem to bother anyone at the Loktafeasta as the festival mixed performances from artists in both Sami language and Finnish.

Some drank beer and ate sausages and the crowd seemed to enjoy the summer festival atmosphere despite spells of rain.

"When I rap about my culture ... I want to show how being Sami is like from my point of view," Laiti told AP.



Artist Talonpoika Lalli performs at the Loktafeasta rap festival in Utsjoki village, Finland. AP

"Because there are many stereotypes about Sami people and I want to like normalize ... the basic stuff we do and not romanticize those things," he said. He added that he has not worn the gakti for performances for about a year now to show people that it is possible to be Sami and wear whatever you want.

Only recognised indigenous people

The Sami traditionally live in Lapland, which stretches from northern parts of Norway to Sweden and Finland to Russia. However, of the roughly 10,000

Sami people living in Finland, the majority now live outside their homeland.

The Sami people were oppressed for centuries by the powers that ruled and exploited their lands, including bans of the use of their native tongues and efforts to suppress their culture.

In the past decades, there have been efforts to reestablish their rights, including the right to use Sami languages which is now guaranteed in the Finnish

constitution. Today, the historically seminomadic Sami people have

modern lifestyles. The few who still tend reindeer do so with modern vehicles, digital tools and regulated land use.

At the festival, Laiti mostly wanted his fans to be happy and enjoy the music. "I want people to feel joy, of

course, and I just want people to

be happy that we have this kind

of festival here in Utsjoki," he said with a smile. Among the other acts was a duo comprised of self-confessed old school tango crooner Jaakko

Laitinen and rapper Jouni J. They also reside in Lapland and perform in Finnish.

EXPLAINED GLOBAL

THE PATRIOT MISSILE SYSTEM, AND HOW IT IS HELPING UKRAINE IN WAR

GERMAN DEFENCE Minister Boris Pistorius is set to discuss the possibility of Germany paying for American Patriot air defence systems for Ukraine, as he heads to Washington to meet with US Secretary of Defence Pete Hegseth.

On Sunday, US President Donald Trump said the US would send an undisclosed number of Patriots to Ukraine, and that the European Union would pay for them.

Ukrainian President Volodymyr Zelenskyy has asked for more defensive capabilities, among them Patriot systems and missiles. to fend off attacks from Russia.

What is the Patriot system? The Patriot, short for Phased Array

Tracking Radar for Intercept on Target, is a mobile surface-to-air missile defence system developed by Raytheon Technologies. It is considered one of the most advanced air defence systems in the US arse-

A typical battery includes radar and control systems, a power unit, launchers, and support vehicles. The system can intercept aircraft, tactical ballistic missiles, and cruise missiles, depending on the interceptor used.

nal and has been in service since the 1980s.

How does the Patriot work?

The system has different capabilities depending on the type of interceptor used.

The earlier PAC-2 interceptor uses a blast-fragmentation warhead that detonates in the vicinity of a target, while the PAC-3 family of missiles uses more accurate technology that hits the target directly.

It is not clear what kind of Patriot systems have been donated to Ukraine, but it is likely that Kyiv has at least some of the newer PAC-3 CRI interceptors.

The system's radar has a range of more than 150 km, the North Atlantic Treaty Organization (NATO) said in 2015.

Although the Patriot was not originally designed to intercept hypersonic weapons and Raytheon has not yet confirmed if it is able to do so, in May 2023 the US confirmed Ukraine had used it to



Patriot missile defence system in **Slovakia.** Reuters File

shoot down a Russian Kinzhal missile, which Moscow claims is hypersonic.

How widely is it used?

Raytheon has built and delivered more than 240 Patriot fire units, according to its website. These have been shipped to 19 countries, according to Raytheon, including the US, Germany, Poland, Ukraine, Japan, Qatar, Saudi Arabia and Egypt.

In January, Axios reported the US had transferred about 90 Patriot interceptors from Israel to Ukraine.

How much does it cost?

A newly produced single Patriot battery costs more than \$1 billion, including \$400 million for the system and \$690 million for the missiles in a battery, according to the Center for Strategic and International Studies.

Patriot interceptors are estimated at around \$4 million per missile, CSIS says.

Why does Ukraine want more Patriot

Kyiv has consistently asked Western allies for more air defences to protect critical infrastructure and civilian areas from frequent Russian missile and drone attacks.

Ukrainian officials say Patriot systems are essential to defending key targets from Russia's escalating long-range at-**REUTERS**

EXPLAINED SCIENCE

WHY THE EARTH IS SPINNING FASTER THAN BEFORE — FOR NOW

IT WOULD not be summer without the stretched out days. But when it comes to the full astronomical day — a single rotation of planet Earth in which the hour hand moves twice around a standard clock — some of this year's shortest will be in July and August.

Last week has seen the shortest days of the year so far. According to data posted on July 11 from the US Naval Observatory and the International Earth Rotation and Reference Systems Service, rotation on July 9 was about 1.34 milliseconds less than 24 hours.

Not all days are equal

This is not completely out of the ordinary: Earth's spins have been faster than usual lately. The average day has mostly shortened over the past decade, and within the past five years or so, the full rotation has clocked in at a hair less than 24 hours more often than not. Factors driving the change include movements at Earth's core, atmos-

pheric changes and the Moon's position. But long-term trends do not suggest that the days will shorten in perpetuity. In fact, it is just the opposite. For many millennia, days have been growing longer. A Tyrannosaurus rex that lived 70 million years ago would have experienced an average daily rotation of about 23 1/2 hours, studies have found.

The lengthening trend is expected to continue, according to researchers.

Tug of the Moon

The main reason has to do with en-

ergy lost from the tides. The Moon's gravitational tug is responsible for tidal changes on Earth. Tidal currents heat the ocean very slightly, dissipating energy, which slows the rotation of Earth and lets the Moon move farther away as time passes. (At the moment, the rate of retreat is around 4 cm each year.)

In other words, the Moon and Earth can be thought of as a single system whose total angular momentum — a measurement of its rotation — is constant. As the Moon expands its orbit, and its angular momentum increases, Earth's angular momentum must decrease. That's why the days grow longer. But that is a process that takes billions of years and is complicated by short-term fluctuations.

In the short-term

Centuries of data show that the speed of Earth's rotation has never been steady. There have been slow periods, like the early 1990s or 1970s, when the length of a day regularly surpassed 24 hours by more than 2 milliseconds. And there have been faster periods, like now.

Many factors within and above Earth drive these changes. These include movement of materials within the planet, from the core to the mantle to the crust.

Recent studies have shown that climate change could also become a key driver of longer days. When ice melts into the sea, it spreads water away from the poles and toward the Equator. That makes the planet more oblate, which can slow its rotation. **THE NYT**

EXPLAINED SCIENCE

Recovery after space journey

Shubhanshu Shukla, the first Indian on the ISS, is back to Earth, but it will be a few days before he can be his normal self. The body is impacted by microgravity, and needs to readjust to conditions on Earth

ANONNA DUTT

NEW DELHI, JULY 15

AS SHUBHANSHU Shukla and his colleagues on the Axiom-4 mission took their first steps on the recovery boat after coming out of the space capsule, they needed some assistance.

It will be some days before Shukla, who returned to Earth on Tuesday after spending 20 days in space - 18 of which were spenton the International Space Station — can get back to normal life. Bodies of astronauts undergo various stresses in space, and require time to recover.

Space environment

The human body is under stress in space due to microgravity conditions and exposure to certain radiations that are absent or benign on Earth. The impact of these stresses depends on the length of the astronaut's stay in space.

During one of his interactions from the ISS, Shukla had said he did not feel his usual self in the first few days.

"It's the first time for me, so I don't know what to expect [upon return]. ... I did have some symptoms coming up, so I am hoping that I will not have it going down," he said.

Mission commander Peggy Whitson, who was on her fifth trip to space, said, "Some people get space motion sickness coming uphill and some people get it going downhill. I am a downhill person where I don't really adjust... [as] well to gravity as I adjust to microgravity".

Getting back to normal

The first thing that the four astronauts, back in Earth's air after almost three weeks, did after walking out of the Grace space capsule was to undergo a health check. They were then taken by helicopter to the NASA Space Centre in Houston, where they will rest for the next few days.

The astronauts' health parameters will be monitored closely — and based on the readings, personalised reconditioning plans will be worked out for each. The recovery plan will focus on improving mobility, balance, flexibility, aerobic conditioning, strength, endurance, and the body's ability to sense its position and movement.

Detailed post-flight medical checks usually continue for a week or longer after return. Impacts on the functioning of the heart, bones, eyes, and immune system are watched, apart from things like sleep disorder and headaches.

Astronauts experience space sickness in their initial days as the brain is confused by the gravity and acceleration information it receives from the inner ear — information that is essential for maintaining balance on Earth. Living in microgravity teaches the brain to not listen to the inner ear, which becomes a challenge when the astronauts return to Earth, as they face difficulty in standing up and walking.

Also, bodily fluids tend to shift because of microgravity conditions, and usually move to the upper part of the body in space — as a result, astronauts experience light-headedness or dizziness after they return.

All these symptoms are likely to be less severe in Shukla and his crew mates who spent just 18 days on the ISS. Astronauts on previous Axiom missions have been able to resume normal lives a week or two after their return.

Need for reconditioning

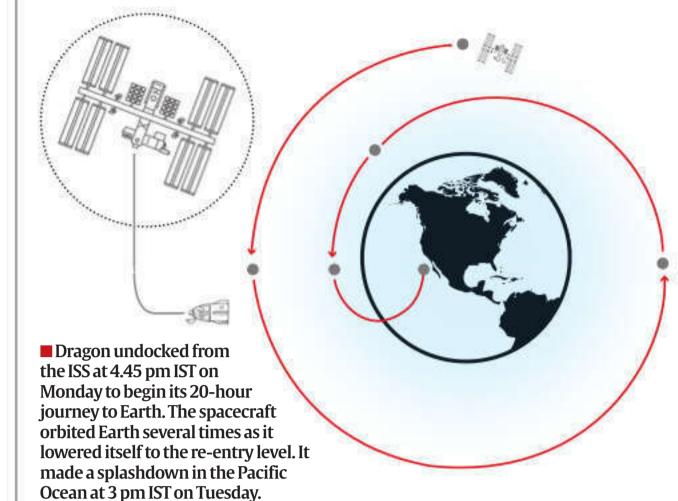
Astronauts need reconditioning after coming back to Earth to deal with their symptoms such as problems with balance, fixing their gaze, and difficulty standing up.

The reconditioning process includes training the astronauts to start listening to their inner ear again, helping with motion control, and taking care of conditions they face while standing. It also deals with their perception of movement of their own bodies, strength, and endurance.

According to NASA, around 92% of astronauts experience post-flight injuries. They may suffer muscle sprains, tendon-related injuries, and fractures.

HOW SHUKLA RETURNED FROM THE ISS

SpaceX's Crew Dragon spacecraft transported Shubhanshu Shukla and others to the International Space Station and also brought them back. It remained docked to the ISS for the period the astronauts were on board.





The Axiom-4 crew were assisted out of the Dragon spacecraft onto the recovery vehicle, after their return from the ISS on Tuesday. Axiom Space/ANI



Crew Dragon autonomously undocks from the ISS, and uses its boosters to move away from the **space laboratory.** *Illustration/NASA*



Before re-entering the Earth's \angle atmosphere, Dragon detaches its trunk to reduce mass and save **fuel.** *Illustration/SpaceX*





The four main parachutes reduce Dragon's speed drastically as it glides down at an angle for a safe splashdown. NASA

Simpler, safer: Why spacecraft prefer splashdowns over landing on ground enough time for it to decelerate to speeds

ALIND CHAUHAN NEW DELHI, JULY 15

THE SPACECRAFT carrying Indian astronaut Shubhanshu Shukla and his three colleagues on the Axiom-4 mission splashed down in the Pacific Ocean on Tuesday after a 20-hour journey from the International Space Station.

Landing in the ocean is the preferred way to bring back astronauts from space, though some spacecraft also make a landing on a runway like an aircraft. But the latter has special requirements, needs more sophisticated systems, and is usually costlier.

For its Gaganyaan programme, Indian Space Research Organisation (ISRO) has designed a crew module that will land on sea.

Why water is preferred

Splashdown is generally a simpler and safer option. When a spacecraft begins to reenter the Earth's atmosphere, at an altitude of 110-120 km, it is usually travelling at speeds up to 27,359 km per hour. There isn't

that are suitable for a vertical landing on the ground. Additional braking systems, and structures like landing legs would be required.

It is safer to land a spacecraft in water even when it is travelling at 25-30 km per hour — the speed of the Axiom-4 spacecraft at the time of splashdown. The low viscosity and high density of water provides much greater cushion. While it does not ensure a completely smooth landing, it absorbs enough shock from the impact to avoid damage to the spacecraft's structure, payload, or the crew inside. The other reason is the availability of vast

open spaces. On the ground, the landing location has to be precisely defined; in the ocean, there is no danger of hitting something else even if the spacecraft is dragged a bit off-course by air or water currents.

The capsules are designed to float on water. They are conical in shape, and either their top or bottom (depending on how they land) is rounded metal, which works

like the hull of a ship, and keeps them bobbing on the surface.

How landing is executed When a spacecraft re-enters the Earth's

atmosphere, it experiences deceleration due to friction. But additional measures are required to slow it to safe speeds.

One such method is the use of parachutes. Spacecraft usually deploy two drag (or drogue) parachutes first, which stabilise the vehicle following re-entry, and reduce speed. The Dragon spacecraft deploys these parachutes at around 18,000 feet.

At about 6,500 feet, the drogue parachutes are detached, and the four main parachutes are released, which continue to slow the spacecraft further.

The spacecraft does not travel vertically to Earth, but glides down at an angle. From the point of re-entry to touchdown, it traverses a distance of 5,000-7,000 km. During this time, its speed comes down to about 25-30 km per hour, which is safe for a splashdown in the ocean.

Grok's praise for Hitler is part of a deeper Al problem. Here's the reason why

EXPLAINED

AI

KARAN MAHADIK NEW DELHI. JULY 15

ELON MUSK'S artificial intelligence (AI) company xAI has apologised for the "horrific behaviour" of its chatbot, Grok, which last week posted praise for Adolf Hitler.

This March, the behaviour of Grok, which was integrated into Musk's social media platform X in 2023, drew the attention of India's IT Ministry after it returned responses containing expletives and misogynistic slurs in Hindi slang.

Determinants of AI behaviour

There have been problems with output from other chatbots too. For instance, Google's Gemini recently generated histor-

ically inaccurate images. Large Language Models (LLMs) are often

assumed to possess a form of human-like intelligence due to their ability to generate coherent and conversational language. In 2021, a now-famous research had equated the current crop of generative AI tools to stochastic – probabilistic or random-function – systems.

These systems are built on "synthetic text extruding machines", according to Emily M Bender, a professor of linguistics at the University of Washington and co-author of the paper (On the dangers of stochastic parrots: Can language models be too big?). "These systems aren't 'saying' anything per se, but rather outputting sequences of words based on their training data," Bender told The Indian Express.

Their probabilistic nature also explains why users rarely receive the same output twice. Even if the input token (a word or characters) is the same, the model could sample a slightly different output token

The subsequent tokens will be generated based on this new sequence. There are two major sources of the un-

from a probability distribution at any step.

controllability of output, Bender said. The first deals with system design. Chatbots achieve great appar-

ent fluency by mimicking word-use patterns in huge datasets. There are bound to be some abhorrent patterns in the training data if the data collection during

the pre-training stage "wasn't done with care" — or if it was done with the assumption that including all the bigotry online somehow produces a more "objective" or "unbiased" outcome, Bender said. The data used by chatbots when an-

swering questions also matters. Grok has

been instructed to use data on X, and this is

one reason why it reflects opinions that are

widely expressed on the platform.

The second source of uncontrollability is user context. During the training stage, a model's parameters are adjusted so that it learns to perform tasks well. Once the model is deployed, these parameters are fixed — and

the only type of learning thereafter is in-context learning. "Even if the system is con-

strained to output only a few

fixed phrases, users can always

set up a context, deliberately or not, that will make the output harmful," Bender said.

Post-deployment controls

On Saturday, xAI said it had removed a set of hard-coded instructions that caused Grok to veer off-course. However, some users said the newly released Grok 4 continues to return antisemitic propaganda. In traditional software, fixing a bug

might involve writing code or rolling out an updated module. However, LLMs are not typically modified once deployed. Most adjustments can only be made superficially.

"The deeper it is in the pipeline — the deepest being pre-training data, then posttraining, and query time — the harder it is to change the model's behaviour," Nirant Kasliwal, an AI/Machine Learning engineer and founder of LLM consultancy firm ScaledFocus, told The Indian Express. He said it was unlikely that Grok's base model would now be changed.

Some band-aid solutions are generally used to realign a chatbot's behaviour:

■ Hard-coded conversations: LLMs can be trained to provide predetermined responses to questions such as "What model are you?". If a few hundred such conversations are added in the training data, the model can be expected to parrot these responses.

■ Brute-force blocking: In 2015, Google integrated its Photos app with image recognition software that identified black people as gorillas. It then tried to "fix" the issue by preventing the software from recognising actual gorillas. But this would undo the gener-

ative qualities that make AI models unique. ■ Modifying system prompts: Developers can exert some control over a model knowledge base by inputting system prompts that will remain constant across multiple user interactions. However, LLM outputs can also be adversely influenced

through prompt injections. ■ **Changing RL rewards:** Reinforcement Learning (RL) encourages the model to go towards solutions that lead to correct answers. This also involves humans giving the AI model feedback on which answers are good or bad. But there have been instances of AI systems finding loopholes in the process.

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