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Boosting gas output while keeping prices low a tough task for Trump

Even with faster permissions for exploration and sales, the new Trump administration may struggle to boost U.S. gas output without help from prices; that's because historically weak gas prices for electricity generation, not restrictive former policies, were the main factor suppressing output

NEWS ANALYSIS

Gavin Maguire
LITTLETON

It may take more than a Sharpie pen and White House cheerleading to change natural gas output levels in the United States.

President Donald Trump's sweeping measures aimed at maximising U.S. oil and gas production mark a U-turn in energy policy from President Joe Biden's term, and make it clear that Mr. Trump expects domestic fossil fuel production to rapidly rise.

But even with faster permitting for exploration and sales, the new Trump administration may struggle to boost U.S. gas output without help from local and international prices.

That's because historically weak gas prices for electricity generation, not restrictive former policies, were the main factor in suppressing U.S. gas production in 2024.

If gas prices trend steadily higher in 2025, Mr. Trump's hopes for higher gas output will materialise and will help propel U.S. energy product exports to new heights.

But higher gas prices would also go directly against Mr. Trump's aims to lower energy costs, which were a major factor behind his successful



Tricky spot: Higher gas prices would go against Mr. Trump's aims to lower energy costs. REUTERS

election.

That presents a potential conundrum for Mr. Trump's energy advisers who must now somehow motivate higher gas output without triggering higher energy prices for consumers.

U.S. gas output from shale and tight gas wells—which account for over 75% of total U.S. natural gas supplies—fell in 2024 for the first time in over a decade as average prices for gas used in electricity generation dropped to historic lows.

The power sector is by far the largest gas consumer in the U.S., and accounted for around 43% of total gas use in 2024, according to the U.S. Energy Information Administration (EIA).



Trump's energy advisers now face the conundrum of motivating higher gas output without triggering higher energy prices for consumers

Average prices received by gas producers from power firms were \$2.77 per thousand cubic feet (Mcf) in January to October 2024, EIA data shows.

That compares to an annual average of \$4.13 per Mcf from the same user base from 2013 through 2023, and means that some gas suppliers received 33% less for their

gas in 2024 than they received over the previous decade from their top customer. For some high-cost gas producers, 2024's average prices were the lowest received this century aside from 2020—when COVID-19 stifled total energy use.

Going forward, all U.S. gas producers will be buoyed by the broad support for their sector shown by the new administration, but the shale sector will have the ultimate say over the scale of any output changes.

Between 2013 and 2023, U.S. shale gas output jumped by 191% to roughly 35 trillion cubic feet.

That explosive growth pace helped lift total U.S. gas supplies from all for-

mations by 54% from 2013 to 2023, to 45.5 trillion cubic feet, according to EIA. However, that blistering expansion also chewed up large portions of the most easily recoverable reserves in major U.S. shale deposits, and means the cost of extracting the remaining reserves will likely creep higher.

Further, over the same decade gas output from conventional gas wells and coalbed wells dropped by around 50%, while gas output from crude oil wells dropped by 16%. That means that without higher selling prices for the gas they produce, few gas producers of any formation type will be able to afford to lift production without incurring additional costs.

Price woes

The price pain for natural gas supplies is not just from the electricity sector, as the average prices received for LNG exports also dropped in 2024.

LNG export prices averaged \$6.22 per Mcf in January to October of 2024, down 18% from 2023 and down 50% from 2022, EIA data shows.

Despite the lower average prices, U.S. LNG exports scaled a new record in 2024, expanding 11% on the year to just over 87 million metric tons, according to ship-tracking data from Kpler. However, the configuration of U.S. LNG export

flows in 2024 changed significantly from the prior year, and included a nearly 20% drop to top market Europe and a 30% rise to buyers in Asia.

Those swings in export volumes resulted in higher costs being incurred on voyages outside Europe, as the journey times to China and Japan are often over twice as long as to Europe.

And when combined with the lower prices received for LNG exports, those higher costs further tightened margins for gas sellers despite the overall climb in LNG export volumes.

In 2025, the Trump administration is expected to push for further growth in LNG exports to all regions. But with both Europe's and China's economies dogged by growth issues, consumer demand for LNG on the ground may remain tepid, which may keep LNG export prices subdued.

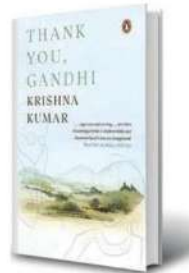
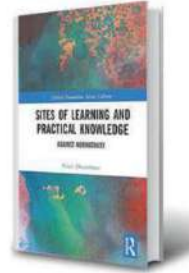
Steadily increasing electricity generation from renewables—which can produce power more cheaply than fossil fuels—may also serve to cap the prices that generation firms will be prepared to pay for natural gas. In turn, these lower LNG and power generation prices may dissuade gas producers from increasing production, even as the Trump administration urges expansion.

(The author is a market analyst for Reuters)





Guiding light: An illuminated installation of Mahatma Gandhi in Belagavi, Karnataka, on December 26, 2024. PTI



Gandhi and reflections on the idea of India, past and present

Two writers engage with Gandhi and his fertile world of ideas and actions to understand the forces that have shaped contemporary India. Both Krishna Kumar and Vivek Dhareshwar reveal to readers how Gandhi offers rich conceptual resources to reflect on the present

Shashikala Srinivasan

How did we come to be where we are today? What kind of forces have shaped us and brought us to our current moment in history? Two recent books, both published in 2024, are an attempt to answer precisely these questions. Despite being vastly different forms of engagement, Gandhi and his fertile world of actions and ideas is central to both.

The first book is *Thank You, Gandhi*, a labour of love, by the well-known educationist and thinker, Krishna Kumar. Though referred to as a novel, the book defies easy generic classification and is an innovative blend of fiction and non-fiction. It is a unique exploration of Gandhi's thoughts and the challenges of keeping his legacy alive in the current political landscape.

The story is largely told through the eyes of the central character Munna, or Viresh Pratap Singh, a brooding, thoughtful IAS officer and the narrator K's childhood friend. Before falling victim to COVID, Munna sends his unfinished manuscript to K and urges him to complete it and present it to a larger audience. Using this fictional device of reconstructing his friend's manuscript, Kumar gives us an evocative portrayal of the events of the last few decades and their disturbing, psychological impact on a generation brought up on the vision of India as dreamt by Gandhi, Nehru and others, an India that was "a modern yet kind, considerate nation." The author vividly portrays Munna's tragic descent into despair and desperation as he sees the more expansive idea of India that he is brought up on slowly collapse with the

rise of the new dispensation. It is during these moments of darkness that Munna engages with Gandhi, walking alongside the philosopher-saint, in dialogue with him.

Thinking with, and against, Gandhi
A powerful socio-political commentary, the author captures the transformation of Bhopal from being a vibrant, plural culture to a discordant, divisive one. The Union Carbide tragedy of December 1984 that killed innumerable people in one night, the festering effect of Partition, the growth of Hindu nationalism and other significant shifts and events of the last few decades are delineated in a layered, compelling narrative. These are interwoven with Munna's engagement with Gandhi's rich idea of Hinduism, his guarded view of science, his notion of truth as a symbol for "the ingredients of morality" and not as mere "fidelity to facts" and his complex ideas on non-violence, swaraj and satyagraha. Sometimes thinking along with Gandhi and sometimes against him, grappling with some of his "quixotic" ideas in Hind Swaraj, these sections, where the past deftly merges with the present, make a fascinating read.

In a moment of acute self-reflexivity, Munna even asks Gandhi whether it was "all right to hate" those in power. Gandhi responds by asking him to instead "hate the system" and urges Munna to think about why truth for him had to be clubbed with non-violence. It is here that Munna seems to grasp that there is something inherent in modern politics that produces excessive identities and hatred. In one of his thoughtful musings, Munna recognises that Hindu nationalism

is a child of colonialism. However, that Hindu nationalism is produced by secularism, escapes him.

Therapeutic engagement

In effect, engaging with Gandhi, for Munna, becomes almost therapeutic, a process of healing and preserving himself, and a way to continue to serve the world in the way he knows best. The narrative ends on a poignant note where K longs for Munna to hear him say "India is a great teacher, my friend, and it never fails to teach whoever tries to bend it." It is in Gandhi, the philosopher-healer, who virtually becomes the embodiment of India, that we have a reminder of India's distinctness and its plural ethos.

Gandhi is also central to our second book, Vivek Dhareshwar's *Sites of Learning and Practical Knowledge: Against Normativity*. A demanding but rewarding read, the book is a tenacious, philosophical enterprise that focuses on the loss of concepts and the destruction of a practical form of life caused by the "experience-occluding structures" of colonialism that persist till today.

Ethical learning

While not exhausted by Gandhi, Gandhi is vital to the book in illuminating the notion of a practical form of life and the idea of ethical learning that is salient to the book's argument. Describing India as a practical form of life that nourishes inquiry into living through various practices, making it possible "to discover experiential truth," the author argues that these varied, rich practices are destroyed by the secularised, moral norms of Western civilisation, brought in by colonialism.

It is precisely these modes of practical learning that enable one to attend to "how to live well" by reflecting on experience that Gandhi aims to restore. It is thus not surprising that it is through Gandhi that practical or experiential knowledge finds the most obvious expression in anti-colonial struggles and he is able to turn an elite freedom struggle into a mass movement.

One can make better sense now of Gandhi's criticism of modern medicine, economics, lawyers, history and representative democracy. Gandhi instead attempts to reconstruct several practical domains in an integrated way as alternative "sites of learning" – the sphere of health and dietetics, erotic, civic conduct and others – all of which are meant to nurture the "practices of the self."

Contrasting religion as inquiry with religion as identity, a distinction informing Gandhi's reflections on religion, the author shows what we take to be Hinduism are "traditions of reflecting on experience." It is immersion in these traditions that "allow Gandhi to diagnose and resist experience-occluding structures in different domains."

Despite their different formulations and diagnoses of our current predicament, both Krishna Kumar and Vivek Dhareshwar reveal to us how Gandhi and his world of ideas offer us rich conceptual resources to reflect on our present and invite us to engage with the question of how we came to be where we are as a society.

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What is U.S.'s new rule for exporting AI chips?

What is the main objective behind one of the last orders of the Biden administration? How will the tiered framework for licensing and exporting Artificial Intelligence chips work? How has the tech industry responded to the move? Will it affect India?

EXPLAINER

Saptaparno Ghosh

The story so far:

With an objective to advance increased control over circulation of Artificial Intelligence (AI) chips and technology, the U.S. Bureau of Industry and Security (BIS) introduced a tiered framework for licensing and exports. It held the regulations were in tandem with "national security and foreign policy interests". Further, it would help "cultivate a secure and trusted technology ecosystem for the responsible use and diffusion of AI".

What technology are we discussing?

Broadly, the regulation concerns advanced computing chips and certain closed AI model weights. AI models are software programs that comprise a series of mathematical operations. When data is entered into the program, it executes those operations on the entered data (provided by the user) to produce outputs which could be information, analysis or media. It is the design of these operations and their arrangement, known as the model architecture, that determines the nature and quality of the output.

What do the regulations propose?

The new regulations update existing rules for export, re-export and transfers (in-country) by segregating countries into three tiers – each harbouring different rules for licensing and authorisation. The first of these tiers entail no restrictions for the export, re-export or transfer of advanced computing chips to 18 U.S. allies and partners, including Australia, Belgium, Canada, South Korea, U.K. and Japan, among others. The second tier introduces caps on volume and exemptions based on specifications alongside mandatory authorisation and licensing. It holds that transactions that could contribute to the development of



advanced AI models would require a Validated End User (VEU) authorisation. Those that do not contribute to the development of advanced AI models, such as chips with a collective computation power of roughly 1700 advanced GPUs, would not need an authorisation. China and India together have been categorised under this sub-head. The third tier includes arms-embargoed countries, such as North Korea, Iraq, Iran and Russia, among others. These countries will have no access to the technology.

Why has access been curtailed?

One of the main objectives has been to ensure that the technology (or equipment) do not reach the "countries of concern" or U.S. adversaries. Furthermore, as detailed in the Federal Register, it strives to ensure that model

weights are stored outside the U.S. "only under stringent security conditions" and that the large clusters of advanced integrated circuits (ICs) necessary to train those models are "built in destinations that pose comparatively low risks of diversion or misuse". The BIS determined that adversaries could potentially use the advanced AI systems to improve speed and accuracy of their military decision making, planning and logistics. BIS also observed that access to systems could potentially lower the barrier for non-experts to develop weapons of mass destruction, support offensive cyber operations and assist in human rights violations (such as through mass surveillance). Separately, it is essential to note that the BIS placed concerns about Chinese companies utilising "foreign subsidiaries in a range of uncontrolled destinations to buy ICs".

What are the concerns?

The primary concern relates to the threat to U.S.' global competitiveness in the realm. Ned Finkle, Vice President of Govt Affairs at NVIDIA – among the largest chip makers globally, wrote in a blogpost that it would undermine the innovation that has kept the U.S. ahead. Mr. Finkle argued that the rules would do nothing to enhance U.S. security. "The new rules would control technology worldwide, including technology that is already widely available in mainstream gaming PCs and consumer hardware."

Ken Glueck, Executive Vice President at Oracle, wrote in December 2024, that the rules assumed there were no other non-U.S. suppliers to procure GPU technology from. Explaining the aspect about competitiveness, the Oracle executive stated that by adding "more chips to the problem, you can keep playing the game". "If your alternate supplier has less performance, you can achieve parity by just adding more GPUs for the task. Enter Huawei and Tencent. Do it a cheaper price. Enter the CCP. And deploy it globally, enter Alibaba," he explained. The rules have been introduced less than a week before President-elect Donald Trump's return to the White House. The tech industry have pinned their hopes on the incoming administration to withdraw the framework.

Do these rules impact India?

According to Pranay Kotasthane, Chairperson at High Tech Geopolitics Programme at Takshashila Institution, big Indian data centres wanting to deploy advanced AI chips might need to apply for the VEU authorisation to speed things up. He observed that Indian companies acquiring the VEU authorisation can utilise the exported items for civilian and military purposes except for nuclear end uses. "All in all, it does not seem to be a big deal. The bigger story is that India is not in the trusted allies and partners category, probably because of the leakages of chips to Russia," he said.

THE GIST

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The oligarchy we see today

In his farewell remarks as U.S. President, Joe Biden warned that an oligarchy was taking shape and threatening American democracy. Similar to Dwight Eisenhower's cautionary warning in 1961 about the "military-industrial complex", Mr. Biden highlighted a "tech industrial complex". He said that a new Gilded Age of "robber barons" was in danger of eroding hard-won freedoms.

As *The Guardian* noted in its editorial, U.S. President Theodore Roosevelt "undermined the 'malefactors of wealth' by trust-busting, creating regulatory agencies and putting land off limits to commercial exploitation." Today, the question of who will rule the U.S. – the people or the new aristocrats – may ultimately be at stake, it said.

Everywhere, political and economic power are intertwined. However, the connection can occasionally turn bleak and dangerous. There are 13 billionaires in U.S. President Donald Trump's cabinet. Elon Musk, the first individual with a net worth of over \$400 billion, asked voters to brace for "temporary hardship" as his Department of Government Efficiency will reduce public spending. Mr. Musk invested \$200 million in Mr. Trump's election campaign. "Oligarchs" are already benefiting from their support for the fossil fuel-friendly President. At Mr. Trump's inauguration, among others, Amazon's Jeff Bezos, Apple's Tim Cook, and Meta's Mark Zuckerberg were present. Some of their businesses have significant contracts with the federal government.

Oligarchy across the ages

The Greek philosopher Aristotle coined the word oligarchy to contrast the ruling of a wealthy few "for corrupt and unjust purposes" with that of the aristocracy, or elite upper class. Oligarchs usually acquire power by financial means, such as making large donations to



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In today's increasingly unequal world, empowered by tech marvels such as Artificial Intelligence, economic power invariably gets concentrated in a few hands

politicians who then govern in ways that the oligarchs specify. But oligarchs can also become powerful because of their social standing, notoriety, education, military, religious, or political ties.

Political scientist Jeffrey A. Winters outlined the historical commonality of oligarchs in his 2011 book *Oligarchy*. How oligarchs respond to the threats they face, including how directly involved they are in supplying the coercion underlying all property claims, whether individually or collectively, all influence their pursuit of wealth defence, he said.

Nonetheless, there have been significant shifts in the nature of oligarchy across the ages. The U.S. media had likened Michael Bloomberg to the Roman oligarch Marcus Licinius Crassus as Mr. Bloomberg was vying for a third term as mayor of New York in 2009. But while for oligarchs such as Crassus, becoming consul was one of the most crucial political moves favouring their fundamental oligarchic interests, for contemporary oligarchs, using private funds to purchase public office is motivated more by vanity than by oligarchic survival.

An oligarchy is only "evil" if and when oligarchs violate the rule of law, remove the checks and balances on their own power, and prioritise their own interests over those of the people, as noted by Aristotle and Robert Michels. This is what happened historically. The Philippines is said to be an oligarchy because of its colonial past and powerful families. China defines itself as a communist 'People's Republic', but some have referred to it as an oligarchy, as a small number of people have held all the power for several decades. More recently, the term has been used to refer to affluent, powerful, and well-connected Russian businessmen. But in 2022, U.S. Senator Bernie Sanders noted, "Of course the oligarchs run Russia. But guess what? Oligarchs run the United States as well."

What is the nature of oligarchy then? In his 2017 book, *American*

Oligarchy: The Permanent Political Class, historian Ron Formisano wrote about the emergence of a permanent political class on a scale never seen in American history. Rising inequality is a result of its corruption, nepotism, and self-dealing. In addition to politicians, Formisano explores the activities of lobbyists, consultants, appointed bureaucrats, pollsters, celebrity journalists, and billionaires working behind the scenes.

Economist Simon Johnson, however, perceived that the emergence of an American financial aristocracy gained traction during the 2008 financial crisis. In 2015, former President Jimmy Carter described the U.S. as an "oligarchy with unlimited political bribery," as the *Citizens United v. FEC* Supreme Court ruling in 2010 lifted restrictions on political campaign donations.

Is oligarchy confined to a select few countries? As Mr. Sanders said, "...All over the world, we're seeing a small number of incredibly wealthy people running things in their favour." It would be unjust to blame only Mr. Trump for encouraging oligarchy. Several billionaires contributed to Mr. Biden's re-election campaign too.

Democracy and oligarchy

Can democracy fight against oligarchy? Despite Aristotle's assertion in his book, *Politics*, that "democracy is safer and more free from civil strife than oligarchy," the German sociologist Robert Michels' early 20th-century 'iron law of oligarchy' contends that democracy is an oxymoron because it will inevitably turn into an oligarchy due to the necessity to divide labour.

More than 200 years ago, U.S. President John Adams had expressed fear about the 'power elite'. In today's increasingly unequal world, empowered by tech marvels such as Artificial Intelligence, economic power invariably gets concentrated in a few hands. This may lead to intense oligarchy.

China's moves must recast India's critical minerals push

In January 2, 2025, China's Ministry of Commerce (MOFCOM) expanded its export control list by including 28 entities from the United States, effectively restricting their access to a swath of items classified under dual-use export controls. At the core of these restrictions lies minerals and rare and refined materials that are vital for high-technology applications such as in aerospace, semiconductors, batteries, and advanced electronics. Beijing's list encompasses tungsten, gallium, magnesium, beryllium, hafnium, lithium-6 (isotope), and others – minerals with uses ranging from chip production to speciality alloys.

This is not the first time that China has weaponised the exports of its critical minerals. And it is an approach that is strategic and calculated. Beijing primarily targets minerals that are deemed to be critical by western nations and their allies, especially those essential for semiconductors, batteries, and high-tech manufacturing. However, China carefully balances these decisions against two constraining factors: it avoids controlling minerals which are heavily dependent on western raw material imports. And it refrains from actions that could disrupt its domestic industrial enterprises or export-dependent sectors. This strategic calculus was evident in China's rare earth minerals embargo against Japan in 2010, its recent restrictions on antimony, gallium, and germanium exports, and its ban, in December 2023, on rare earth extraction and processing technologies.

The situation in India

Meanwhile, policymakers in the United States and elsewhere are becoming increasingly concerned. These developments underscore a larger trend: the competition for critical minerals has become a fulcrum of international economic diplomacy. For nations such as India, these events are also a wake-up call – to improve domestic mineral exploration and production capacity.

India's push for critical minerals development



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India's critical minerals development plans face challenges; a way out may be to adopt the semiconductor fabrication model

has faced stubborn challenges. In 2023, lithium deposits that were found in Jammu and Kashmir's Reasi district made headlines, hinting at a game-changer moment for India's energy transition. However, a little over a year later, the story remains lacklustre: no company has shown interest in bidding for these resources, and the block remains in limbo. Unfortunately, this is not an isolated incident. Government data show that only 48% (24 out of 49) of the mineral blocks available for auction in recent years have been auctioned.

This lack of market enthusiasm cannot be pinned entirely on government negligence. Over the last three years, the Union government has introduced measures to spur activity in critical minerals. The Ministry of Mines identified 30 critical minerals that are deemed essential for national security. And before that, the Union government set up a designated body, Khanij Bidesh India Ltd. (KABIL), which has been tasked with obtaining overseas investments in critical minerals such as lithium and cobalt. Parliament passed the Mines and Minerals (Development and Regulation) Amendment Act, 2023, lifting restrictive classifications on some rare earth elements that used to be considered 'atomic minerals'. These reforms theoretically opened the door for greater private-sector investment and technology sharing.

Reforms and results

A key highlight of the 2023 amendments is the introduction of an 'exploration license', devised to attract specialised resource exploration agencies, including foreign companies, to survey potentially rich but geologically challenging deposits. Instead of having to commit to a full-scale mining operation that can take over a decade or more to turn profitable, these exploratory firms can now participate in reconnaissance and prospecting alone. The law also promises to reimburse 50% of the exploration expenditure once mining begins, aiming to de-risk early-stage operations.

Despite these promising reforms, the results have been tepid. Only a handful of exploration

licences for minerals such as lithium, rare earth elements, and graphite have been cleared, and those mostly went to Indian public sector firms. Foreign participation is sparse, and further downstream, mining license auctions for critical minerals have largely stalled.

One explanation is that India's resource classification system is outdated, leaving miners unsure about the commercial viability of mineral blocks. Exploration levels – often categorised under international norms as G1, G2, G3, or G4 – require progressively detailed geological data on ore grade and quantity. Many auctioned blocks in India have yet to reach advanced exploration status, making them riskier to prospective bidders. That said, a more puzzling factor is the low demand for exploration licences themselves – an option that should, in principle, help de-risk investments but evidently has not had the intended effect.

Fiscal incentives may be essential

This brings us to the essential role of high-quality data. Exploration is at the heart of mitigating 'information asymmetry', where potential buyers (mining companies) and the seller (government) do not share a clear view of the resource's true value. Without robust geological surveys, many bidders discount their offers or abstain entirely. The result is suboptimal auctions, with some potentially valuable blocks simply overlooked.

A possible remedy is to offer larger upfront fiscal incentives during the exploration phase. In other words, the solution might be to approach critical minerals extraction as a semiconductor fabrication project. In chip manufacturing – another sector with enormous upfront costs and slow returns – India has taken an aggressive approach, pledging direct capital support early in the construction phase. A similar model could work for critical minerals, offsetting immediate exploration costs instead of reimbursing them only after production begins. Upfront capital support for exploration would resolve a market failure and help unlock value many times over in downstream mining, exploration, sales, and exports.



It's Russian roulette in the skies

Over 70 years ago, Ian Fleming created the fictional character of a secret service agent called James Bond, code named 007, who had the licence to kill. On September 1, 1983, a Korean Airlines jet, flight 007, on a scheduled flight from New York to Seoul via Anchorage, was shot down by a Russian Air Force Sukhoi fighter plane when the Korean flight had deviated from its flight path due to a navigational error. All 246 passengers and 23 crew were killed. One of the passengers was the daughter of Hans Ephraïmson-Abt, who began an organisation to aid the victims of air accidents. His initiative resulted in a big push at the International Civil Aviation Organization (ICAO) to publish rules regarding conflict risk. But this was shot down by Russia and its allies in ICAO.

Cases of misidentification

On July 3, 1988, an Iran Air plane, flight 655, was shot down by a United States Navy warship, *USS Vincennes*, over the Strait of Hormuz. All 290 passengers were killed when the ship's missile brought down the plane which was misidentified to be a fighter plane. During the Iran-Iraq war (1980-88), U.S. patrolling required civilian aircraft to transmit the Identification Friend or Foe mode code. Apparently, the warship crew identified the Iranian aircraft to be a fighter and orders were issued to shoot it down.

On November 22, 2003, a DHL Cargo plane took off from Baghdad for Bahrain. As the flight was making a rapid climb out, a surface to air missile launched by terrorists struck the left wing between the engine and the wing tip. The crew lost all hydraulics and because the fuel tank was full, there were no fuel vapours to explode in the exposed fuel tank. The crew controlled the flight using only differential engine thrust and managed to carry out a safe landing, displaying exceptional skill. This writer had the privilege of attending a special presentation by the crew at the Flight Safety Foundation IASS 2004 seminar at Shanghai, China.

On February 27, 2019, just after Balakot, when fighter planes of the Indian Air Force (IAF) and the Pakistan Air Force were engaged in a dogfight, an IAF Mi-17 helicopter was shot down by a surface-to-air missile of the IAF's air defence system. Six personnel lost their lives in what was a serious error. Here again, the helicopter was wrongly identified as a foe.



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With military conflicts and incidents of state players posing threats to civil aviation rising, the issue of training proficiency and skills assumes importance

On July 17, 2014, a Malaysia Airlines flight, MH17, from Amsterdam to Kuala Lumpur with 283 passengers and 15 crew, was shot down by Russian-backed forces with a surface-to-air missile while flying over eastern Ukraine. All these examples highlight the issue of misidentification.

Post September 11, 2001, there are specific procedures to be followed in the event of track deviation due to weather, or a failure of navigation signals. Specific radio procedures are implemented for crew to comply with, else air force fighter jets may shoot down a civilian aircraft if perceived to be flying in a suspicious manner. On February 16, 2017, an Indian airline flight, Jet Airways flight 9W 118, with 330 passengers and 15 crew members, from Mumbai to London, was cruising at 36,000 feet. It flew over a few flight information regions without maintaining radio contact with the air traffic control of the region. The plane had not deviated from its assigned track. When it entered German airspace north of Cologne, the German Air Force deployed two of its Eurofighter Typhoons to intercept the Indian plane. Had the Jet Airways crew not responded to the Germans on an emergency frequency, they could have been shot down.

India's safety regulator, the Directorate General of Civil Aviation (DGCA), did a cover up terming it as a malfunction of the aircraft's communication system. If it was really a communication failure, the aircraft crew should have been using the necessary transponder code and ground stations would have known that it was an aircraft facing communication failure. Fighter jets would not have been deployed to intercept it.

Conflict zones, their dangers

The case of an Azerbaijani airliner, while on a flight from Baku in Azerbaijan to Grozny, in Russia, on December 25, 2024, but which crashed near the Kazakhstan city of Aktau after being diverted, has been the result of another event where a Russian anti-aircraft defence system may have caused the loss of lives. Of the 67 passengers on board, there were some survivors. For a state to get away with it by just saying 'sorry' does not bring back the precious lives lost. The aircraft had veered from its scheduled route due to fog. There is also the issue of GPS spoofing and false signals

or a loss of signals that affect navigation.

More than 500 people have lost their lives due to civil airlines being shot down. With growing wars and conflicts, flying over or near conflict zones is becoming dangerous, especially when there are countries which do not respect international borders and there are rogue elements who cause trouble by interfering with GPS signals.

The Indian regulator's silence

This brings the focus on a serious issue. Do airlines in India have comprehensive training in place for pilots to recognise jammed signals and do the airlines have standard operating procedures in place for taking over the navigation with alternate methods? There are reports of GPS errors or failures in the airspace over Pakistan, Afghanistan and Myanmar. With a rapid expansion of flights and with large numbers of aircraft being inducted, do airlines in India have enough experienced pilots? For example, Air India operates many of its non-stop flights to the west coast of the United States on routes that are avoided by American carriers. There are also reports of some leased aircraft with Air India not being equipped for extended flights over mountainous terrain. We hear nothing from the DGCA on what preventive measures it is taking in these cases.

We have had three passenger aircraft shot down by the Russians or Russian-linked agents. We have had the U.S. Navy shooting down a passenger airliner. We have had a cargo aircraft shot by a terrorist group with missiles supplied by either Russia or the U.S. as conflicts in West Asia have involved one or the other super power aiding sides in the conflicts. The large-scale use of drones and defence forces using missiles to shoot down flights make the skies really unsafe for passenger aircraft while flying over conflict regions. There is another danger. Skill levels have dropped as there is now rapid training which has resulted in degraded monitoring to assess pilot proficiency. The world has to wake up and take cognisance of this new danger. Indian aviation may be expanding rapidly but, at the same time, there is no urgency or compulsion to ensure the quality of pilots' flying skills. As James Reason's Swiss cheese theory explains, the holes in the cheese are lining up.

Do we act now or let another disaster pass?



Changed dynamics

India must chart a new transactional course with Trump administration

The first 48 hours of U.S. President Donald Trump's second term have been proof of the radical shifts he plans over four years, with the overarching theme of putting "America First". While the strengthening of India-U.S. ties during his first term should give those in New Delhi attempting to strategise for this term some comfort, his moves now make it clear that it will be necessary to expect the unexpected as well. The slew of Executive Orders changes U.S. policy on energy, the environment and climate change, trade and global taxes, citizenship routes, health, border control and immigration. But the new administration has shown it is keen to engage India: External Affairs Minister S. Jaishankar, who was invited along with other Quad Foreign Ministers at the inaugural ceremony, was the first Foreign Minister to hold a one-on-one bilateral meeting with new U.S. Secretary of State Marco Rubio. The readout of their meeting and the Quad Foreign Ministers' joint statement make it clear that the two sides are on the same page on the Indo-Pacific partnership, concerns over Chinese actions, critical and emerging technology cooperation, strategic and defence ties. Yet, some Trump-Rubio pronouncements have set alarm bells ringing, notably on trade, immigration and the cancellation of citizenship by birth. On trade, India has escaped being named in the first round of tariff announcements, but Mr. Trump's comments on a "100% tariff" against all members of the BRICS emerging economies grouping raised the suspense and a possible market reaction. In his first term, he had withdrawn India's GSP status affecting Indian exporters. On immigration, he has announced a "border emergency", authorised a crackdown on illegal and undocumented migrants, and plans to crush the hopes of H-1B visa holders and other Indians working there, by cancelling the automatic path to citizenship for any children born to them in the U.S. With 7,25,000 undocumented Indians, any action to deport them in large numbers, beginning with about 18,000-20,000 on the Immigration "final list for removal", will be a major crisis for India.

In this context, Mr. Rubio's statement in talks with Mr. Jaishankar that they must address the "irregular migration" should be taken seriously. So too should Mr. Trump's pronouncements insisting on investments in the U.S., hiring in the U.S., and the buying of U.S. energy. The new administration's geopolitical outlook appears to be set on devaluing the multilateral world order, withdrawing from U.S. commitments of support to WHO, the WTO, and the UN, and putting NATO allies on notice. Given the signs, New Delhi must be prepared for a U.S. administration that will not be particularly sensitive to India's concerns or be a willing partner in India's growth unless it sees a benefit for itself, and instead chart a more transactional course, while moving to limit the damage from any adverse actions of the Trump era.



Space telescopes stumble on rule-breaking black hole

LID-568 is a low-mass supermassive black hole that existed just 1.5 billion years after the Big Bang. An analysis of its effects on its neighbourhood has indicated that it was feeding on a surrounding cloud of matter at almost 40 times greater than what astrophysicists thought was the upper limit

Shreejaya Karantha

An international team of researchers using NASA's James Webb Space Telescope (JWST) and the Chandra X-ray Observatory has discovered a bizarre black hole that may provide insights into the genesis and growth of supermassive black holes.

Supermassive black holes are among the most common types of black holes in the universe. Most galaxies contain a supermassive black hole at their centres. These black holes have masses ranging from millions to billions of times that of the sun. The supermassive black hole Sagittarius A*, located at the center of the Milky Way galaxy, has a mass of approximately 4.3 million solar masses.

However, scientists are not yet fully certain how these giants grow to become so big.

Beyond the upper limit

The newfound black hole, designated LID-568, is a low-mass supermassive black hole that existed just 1.5 billion years after the Big Bang. If the universe were a human, it could be said to be around eight years old at this time.

A detailed analysis of its effects on its neighbourhood indicated that the black hole was feeding on a surrounding cloud of matter at an exceptional rate – almost 40 times greater than what astrophysicists thought was the upper limit.

The study was led by International Gemini Observatory/NSF NOIRLab astronomer Hyewon Suh, and the results were published in the journal *Nature Astronomy* in November 2024.

"We first identified this unusual object through Chandra X-ray observations, as it was exceptionally bright in X-rays but completely invisible in the deepest optical and near-infrared observations, even with the Hubble Space Telescope," Suh, the lead researcher, said.

"Because it was only detected in X-rays, we couldn't determine its nature. With JWST's unparalleled sensitivity in the infrared, we were finally able to uncover this exotic object, highlighting the complementary power of these observatories," she added.

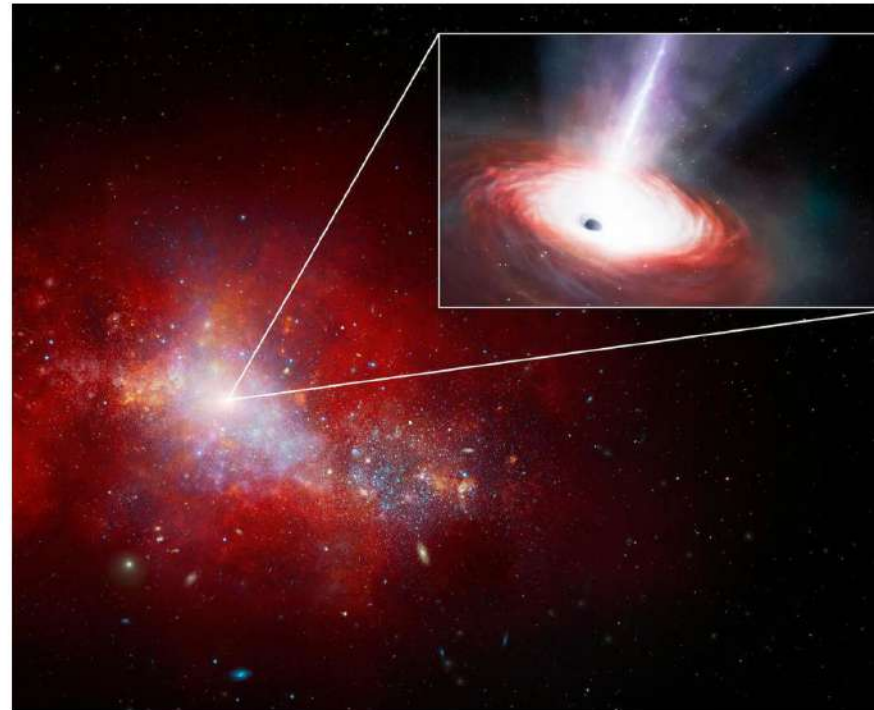
A class apart

The rate at which a black hole feeds on matter is governed by what astronomers call the Eddington limit. This limit – named after the English astronomer Arthur Stanley Eddington because he worked it out first – is also related to how brightly a black hole can shine.

Nothing can escape a black hole, of course. But when a black hole pulls surrounding matter towards itself, the infalling material becomes compressed, heats up, and emits radiation, especially X-rays.

The concept behind the Eddington limit is straightforward: as matter collects around the black hole and gets packed into the disc, it heats up and emits radiation that generates an outward pressure capable of counteracting the gravitational pull of the black hole. When this radiation pressure balances the force of gravity, the black hole will stop accruing the matter. Ergo, there is a limit on how brightly the black hole can shine.

If this limit is crossed, the scenario is called a super-Eddington accretion. This



An artist's concept of a red, early-universe dwarf galaxy that hosts the black hole LID-568 at its centre. While short-lived, this black hole's 'feast' could help astronomers explain how supermassive black holes grew so quickly in the early universe. NOIRLAB/NSF/AURA/J. DA SILVA/AM. ZAMANI

is the category in which LID-568 lies.

Suh said that they measured the total light coming from the black hole and its mass using observations from Chandra and JWST's Near-Infrared Spectrograph instrument, which revealed the exceptional accretion behavior of LID-568.

Experts have hypothesised that super-Eddington black holes can exist. They have even found a few. But LID-568 has defied their expectation in two ways. First, it's much, much farther away. The most distant of these other black holes is "only" around 2.3 billion light years from earth. Second, while the known rule-breakers exceeded the Eddington limit by a factor of two or three, LID-568 has done so by a factor of roughly 40, according to Suh.

Super-Eddington episodes in black holes are expected to be short-lived, so it is also remarkable that researchers captured LID-568 in action.

Making sense of the oddball

The existence of supermassive black holes that are millions or even billions of times more massive than our sun poses a challenge to current models of black hole formation and growth. Scientists have confirmed that such black holes reside at the centres of many galaxies that should have formed when the universe was less than a billion years old. However, they can't explain how these objects came to be when the universe was so young, when there shouldn't have been enough matter for them to form.

According to some traditional models, Suh said, "supermassive black holes are thought to form from the death of the first star, i.e., light seeds with 10-100 times the mass of the sun, and/or through the direct collapse of primordial gas clouds, such as heavy seeds with 1,000-100,000 times the mass of the sun."

"However, these models lack direct observational confirmation and require sustained, continuous accretion of large amounts of matter over several hundred million years to account for the most extreme supermassive black holes observed in the early universe, which is likely difficult," she added.

The discovery of LID-568 is crucial because it suggests that large black holes could have put on a significant fraction of their weight during short-lived episodes of rapid feeding. If true, this mechanism would do away with black holes having to feed on large quantities of matter for a very long time and offer "a convincing explanation for how supermassive black holes could form so quickly, regardless of their initial seed mass," whether heavy or light.

Chasing more black holes

Suh also said there are several theories to explain how black holes can exceed the Eddington limit, including geometrically thick accretion discs, powerful black hole jets, and black-hole mergers. However, she said that her team still doesn't fully understand the exact mechanism that allowed LID-568 to feed so fast and that follow-up observations with JWST will be

The existence of supermassive black holes millions or even billions of times more massive than our sun poses a challenge to current models of black hole formation. Scientists can't explain how they came to be when the universe was so young, when there shouldn't have been enough matter for them to form

crucial to admitting or eliminating other hypotheses.

The researchers also found that the galaxy where LID-568 resided wasn't producing many new stars – the result of the black supermassive hole driving powerful streams of material outward from the centre, called outflows. These outflows could be preventing matter from accumulating in enough quantities to form stars.

To confirm this idea as well as to inform it with more data, Suh said she and her team are planning to examine similar galaxies and examine their outflows, especially those driven by very large black fast-snacking holes.

The research team is also planning to find out how long a black hole can accrue matter at a super-Eddington rate as well as what percentage of all black holes do so.

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In a first, a tribal king from Kerala to attend Republic Day parade in Delhi

Sandeep Vellaram
IDUKKI

Raman Rajamannan, the head of the Mannan community and the only tribal king in Kerala, will participate in the Republic Day parade in Delhi.

According to officials, the king and his wife will join the event as guests of the Scheduled Tribes (SC) Development Department. Minister for Welfare of Scheduled Castes, Scheduled Tribes, and Backward Classes O.R. Kelu handed over the invitation to Mr. Rajamannan.

According to officials, this will be the first time a tribal king will attend the Republic Day parade in Delhi. The SC Development Department will meet the travel expenses of Mr. Rajamannan and his



Minister O.R. Kelu handing over the Republic Day invitation to king of Mannan tribal community at Thiruvananthapuram on Tuesday.

wife, Binumol.

During the visit, the couple will meet the President and other prominent leaders. He will also visit Agra and other historically important places in the capital. They will be returning to Kerala on February 2.

According to officials, the Centre demanded the

participation of persons from the tribal community of the State for the Republic Day parade. The SC Development Department then decided to send the couple as representatives of the community.

“The government’s decision is an honour to the Mannan community,” said

the official.

On Tuesday, Mr. Rajamannan and Ms. Binumol visited the State Assembly, and was received by Mr. Kelu. Devikulam MLA A. Raja accompanied them.

48 settlements

The Mannan community is mainly settled in the buffer zone area of the Idukki Wildlife Sanctuary at Kozhimala, the hub of the tribe with 48 settlements ruled by a king, the only such community in southern India.

The king is an integral part of the traditional functions and festivities of the community.

He will wear a turban or headgear and special dress on such occasions and will be assisted by two Ministers and soldiers during the functions.

