New, Emerging & Strategic Technologies Division
Ministry of External Affairs
Government of India

TECH PULSE

NEST NEWSLETTER OCTOBER 2025

Key Highlights

- *India has developed its first indigenously discovered antibiotic 'Nafithromycin'*
- *Quantum simulations that once needed supercomputers now run on laptops*
- *India Unveils Indigenous 7 nm Processor, Marking a New Era in Semiconductor Self-Reliance*

➔ ***India AI Impact Summit 2026 – Brief Glance***

CONTENTS

C O N T E N T S

ARTIFICIAL INTELLIGENCE

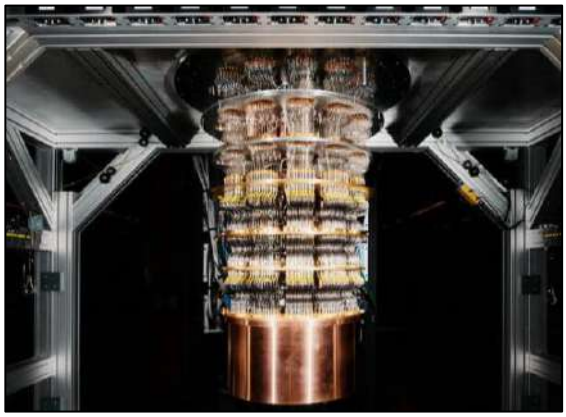
International

1. ***EU Launches 'Apply AI Strategy': A €1B Bid to Break Free from U.S. and China***

The European Commission has introduced the Apply AI Strategy, a €1 billion ($1.1 billion) initiative to accelerate the adoption of artificial intelligence across critical industries and reinforce the European Union's technological independence. The plan, announced on October 8, 2025, by Commission President Ursula von der Leyen, is part of the EU's broader goal to reduce reliance on U.S. and Chinese technologies and to embed an AI-first approach in its industrial and governance systems.

The initiative builds on an April 2025 action plan aimed at easing compliance burdens for startups affected by the EU's landmark AI Act. Funding will come from existing research and innovation programmes such as Horizon Europe and Digital Europe, with expectations of matching contributions from member states and private partners. The strategy identifies key sectors for AI deployment, including healthcare, pharmaceuticals, energy, mobility, manufacturing, construction, agri-food, defence, communications, and culture. Planned measures include establishing AI-powered screening centres in healthcare, developing agentic AI for manufacturing and climate applications,and integrating AI in public and industrial infrastructure. Von der Leyen emphasized that the goal is for 'the future of AI to be made in Europe,' highlighting the EU's ambition for digital sovereignty and industrial resilience. By promoting open innovation, cross-sectoral collaboration, and responsible AI use, the Apply AI Strategy seeks to position Europe as a global leader in artificial intelligence while strengthening its economic competitiveness, innovation capacity, and strategic autonomy in an increasingly polarized technological landscape.
Read More

2. ***Google's Quantum Computer Makes a Big Technical Leap***



Google has a major breakthrough in quantum computing, demonstrating a new quantum algorithm called Quantum Echoes that runs 13,000 times faster than comparable software on a top traditional supercomputer. This marks one of the most significant advances in quantum computing since the field began accelerating in the last decade.The development was led by Nobel Prizewinning physicist Michel H. Devoret, who joined Google in 2023 and has been a key figure in advancing superconducting quantum circuits. His earlier research in the 1980s showed that quantum behavior could be observed in electrical circuits large

enough to see, a discovery that helped enable today's hardware, including Google's superconducting qubit chip, Willow. Quantum computers operate differently from classical machines because they use qubits, which can represent 1 and 0 at the same time through a property called superposition. This allows computing power to scale exponentially as the number of qubits increases. Recent improvements in quantum error correction have raised confidence that practical, scalable quantum computing may become possible by the end of this decade.

A second research paper shows that Quantum Echoes can enhance nuclear magnetic resonance, a technique used to examine molecular structures in medicine, chemistry, and advanced materials. Scientists say this could accelerate development in areas such as Alzheimer's research and next-generation building materials. Read More

National

3. ***India proposes strict rules to label AI content, citing growing risks***

India's government has proposed new rules mandating that artificial intelligence and social media platforms clearly label AI-generated content to combat deepfakes and misinformation. The draft amendments to the IT Rules, 2021, announced by the Ministry of Electronics and Information Technology (MeitY) on October 22, 2025, require visible labels covering at least 10% of an image or the first 10% of an audio clip's duration. These rules apply to platforms such as OpenAI, Meta, X, and Google, which will also need to collect user declarations confirming whether uploaded content is AI-generated and maintain metadata traceability.

The government stated that the move responds to the growing misuse of generative AI to spread misinformation, manipulate elections, or impersonate individuals. The proposal also limits content takedown authority to senior officials and requires monthly reviews to ensure accountability. India's move aligns with similar AI-labelling initiatives by the European Union and China, while setting one of the world's first measurable standards for visibility. With nearly a billion internet users, the country is particularly vulnerable to deepfake-related misinformation, which has already triggered lawsuits involving Bollywood actors. Public feedback on the proposal has been taken as India seeks to balance innovation with transparency and user safety in the digital ecosystem. Read More

BIOTECHNOLOGY & HEALTH

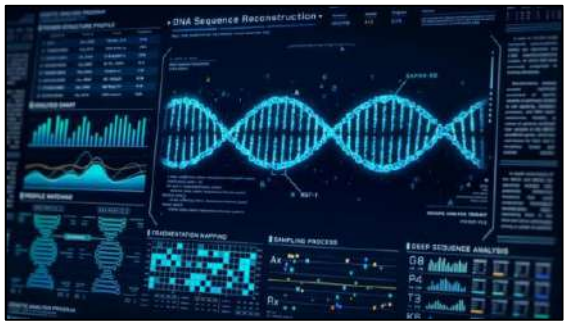
International

4. ***A revolutionary DNA search engine is speeding up genetic discovery***

ETH Zurich researchers have developed *MetaGraph*, a groundbreaking open-source DNA search engine capable of scanning millions of genetic sequences in seconds. The innovation allows scientists to search directly through raw DNA and RNA data in major global databases such as the U.S. Sequence Read Archive (SRA) and the European Nucleotide Archive (ENA), which together store around 100 petabytes

of genetic information, roughly equivalent to all the text on the internet.

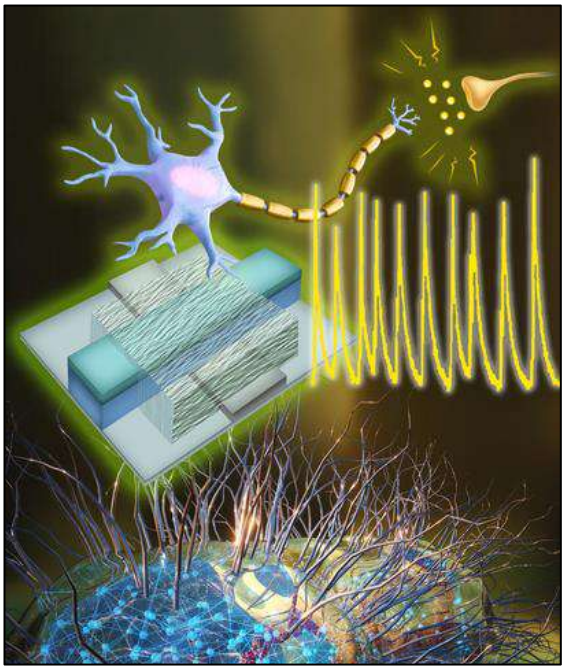
By compressing genetic data up to 300 times and indexing it through advanced mathematical graphs, MetaGraph drastically reduces the computational resources needed to identify patterns, mutations, or specific genetic traits. Researchers can now locate where a genetic sequence appears across public datasets almost instantly, without downloading massive files. Costing just about $0.74 per megabase for large queries, it's a highly efficient tool compared to traditional methods that were slow, incomplete, and expensive.



MetaGraph's scalability and precision make it especially useful in tackling antibiotic resistance, tracking emerging pathogens, and accelerating biomedical research. It can also help identify bacteriophages - viruses that target bacteria, within genomic databases, opening new avenues for therapeutic discovery.

Currently, MetaGraph indexes about half of the world's available genetic data, with full coverage expected soon. Its open-access model could also appeal to pharmaceutical companies and individual researchers. ETH scientists believe it may one day become as transformative for genomics as Google was for the internet, enabling everyday applications from identifying unknown diseases to decoding the DNA of household plants. Read More

5. *Scientists build artificial neurons that work like real ones*



Engineers at the University of Massachusetts Amherst have developed the first artificial neurons capable of directly communicating with living cells, marking a breakthrough in neuromorphic computing. Built from protein nanowires produced by the electricity-generating bacterium *Geobacter sulfurreducens*, these neurons operate at the same voltage level as biological ones, around 0.1 volts, allowing seamless interaction with living tissues. The research demonstrates an unprecedented level of bioelectrical compatibility and energy efficiency, consuming only picojoules of energy per signal, comparable to the human brain's neurons.

Traditional artificial neurons have struggled to achieve such low power operation, typically requiring voltages 10 times higher, which prevented direct interfacing with biological systems. The UMass device bridges this gap using a memristor-based circuit that mimics the charging and firing behavior of real neurons. This allows for sustained, repeatable voltage spikes, enabling one

artificial neuron to trigger another in a brain-like network. Beyond computing, the low-voltage neurons could revolutionize medical and wearable technologies by removing the need for bulky amplifiers in biosensing devices. They can also respond to chemical cues such as sodium and dopamine, mimicking the brain's responsiveness to neurotransmitters. Early experiments even showed synchronization with living heart cells.

The breakthrough could lead to bio-inspired computers, medical diagnostics, and smart interfaces where electronic systems and living cells communicate naturally, signaling a major leap toward truly biocompatible computing and energy-efficient AI. Read More

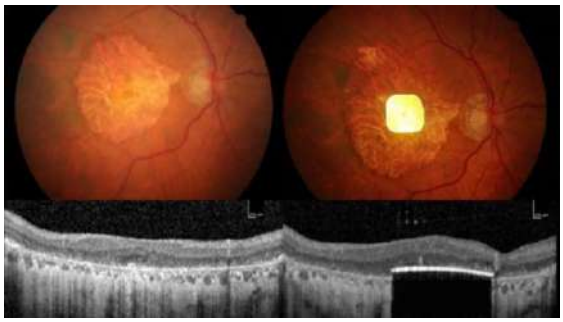
6. ***Scientists suggest the brain may work best with 7 senses, not just 5***

Researchers at Skoltech have developed a new mathematical model of memory that suggests seven senses, not five, may be optimal for processing and retaining information. The study models memory as a system of 'engrams', neural patterns representing concepts characterized by multiple sensory features. By representing each concept in a multidimensional 'conceptual space,' the researchers examined how memory capacity depends on the number of sensory dimensions, or senses.

The model shows that when each concept is described by seven features, the brain's ability to store distinct memories reaches its maximum. In simpler terms, a memory system with seven sensory channels would achieve the best balance between differentiation and information overlap. This finding, while theoretical, could have practical implications for robotics, AI, and cognitive science, especially in designing artificial systems capable of learning and memory similar to humans.

The researchers note that their conclusion is speculative regarding human evolution but might help explain constraints in memory processing. They suggest that if humans evolved additional senses, such as sensitivity to magnetic fields or radiation, it might enhance perception and recall. Beyond biology, the seven-sense framework could inform how artificial intelligence systems encode and retrieve information, leading to more efficient, brain-like computational models. According to Professor Nikolay Brilliantov of Skoltech AI, the model's robustness indicates that the number seven naturally emerges from the mathematics of memory organization, offering new insight into cognition and future AI design. Read More

7. ***Tiny AI-powered eye implant helps the blind see again***



Researchers from University College London and Moorfields Eye Hospital have helped restore reading vision to people blinded by advanced dry age-related macular degeneration (AMD), using a revolutionary AI-powered retinal implant. The device, called PRIMA, combines an ultra-thin subretinal microchip with

augmented-reality (AR) glasses that project visual information directly to the brain.

The European clinical trial showed that 84 percent of participants regained the ability to recognize letters, numbers, and words using prosthetic vision in an eye that had completely lost sight due to geographic atrophy, a late-stage form of AMD. Participants could read, on average, five lines of a vision chart, a remarkable leap for individuals who previously could not perceive it at all.

The PRIMA implant, just 2 millimeters wide and 0.03 millimeters thick, acts like a miniature solar panel, converting near-infrared light projected from the AR glasses into electrical signals transmitted through the optic nerve to the brain. Artificial intelligence algorithms process and refine the image data, allowing patients to see through electronic vision. After surgery and a short recovery, patients undergo intensive visual training to interpret the new signals. No loss of remaining peripheral vision was observed.

According to lead UK researcher Mahi Muqit of UCL, this marks a new era in artificial vision, with the potential to restore independence and reading ability to millions living with untreatable blindness. The breakthrough opens pathways to future treatments for multiple eye diseases and represents one of the most significant advances in neural prosthetics to date. Read More

National

8. India has developed its first indigenously discovered antibiotic 'Nafithromycin'

India has achieved a major scientific milestone with the discovery of its first indigenously developed antibiotic, Nafithromycin, effective against resistant respiratory infections, especially in cancer patients and those with poorly controlled diabetes. The antibiotic, conceptualized, developed, and clinically validated entirely in India, marks a breakthrough for the nation's pharmaceutical self-reliance. It was developed through a collaboration between the Department of Biotechnology and private pharma company Wockhardt, representing a successful example of government-industry partnership.

Announcing this at the inauguration of a three-day medical workshop on Harnessing Artificial Intelligence for Multi-Omics Data Integration and Analysis, Union Minister Dr. Jitendra Singh emphasized the need to build a self-sustainable innovation ecosystem to reduce dependence on government funding. He urged stronger private sector and philanthropic participation in research to help India achieve global recognition in science and innovation.

Dr. Singh also highlighted another success story - India's first indigenous clinical trial in gene therapy for Hemophilia, conducted at Christian Medical College, Vellore, with Department of Biotechnology support. The trial achieved a 60-70 percent correction rate and zero bleeding episodes. The Minister noted that India has sequenced over 10,000 human genomes and plans to scale up to one million. He also referred to the Anusandhan National Research Foundation, with an outlay of ₹50,000 crore over five years - ₹36,000 crore from non-government sources, signifying a major policy shift toward private-led research.

Dr. Singh further stressed that artificial intelligence is transforming healthcare, governance, and decision-making. AI-

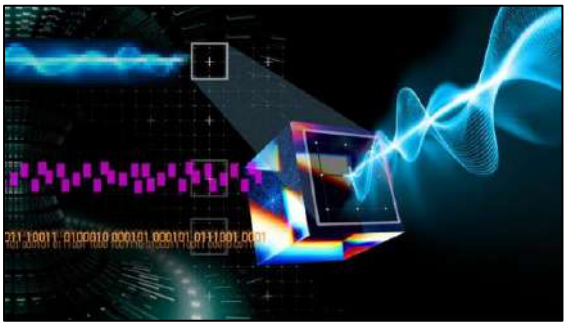
driven hybrid mobile clinics are providing healthcare in remote areas, while AI-based grievance systems have improved efficiency in public service. He commended hospitals like Sir Ganga Ram for integrating AI, biotechnology, and genomics to improve patient outcomes.

He concluded that India is entering a new era of self-reliance in biotechnology, AI, and genomic medicine, where innovation, collaboration, and compassion will shape the country's path toward Viksit Bharat 2047 and global leadership in science and technology. Read More

CLEAN ENERGY

International

9. AI enhances the view inside fusion energy systems



Scientists at Princeton University and the U.S. Department of Energy's Princeton Plasma Physics Laboratory have developed an advanced artificial intelligence system called Diag2Diag, which can fill in missing or incomplete data from sensors monitoring plasma inside fusion reactors. The AI generates synthetic data that matches real measurements and can even provide more detailed information than physical sensors. This innovation could significantly enhance the control and stability of plasma, the superheated fuel for fusion energy, while reducing system complexity and cost.

The research involved collaboration among Princeton University, Columbia University, Chung-Ang University, Seoul National University, and the DIII-D National Fusion Facility. The AI uses data from multiple diagnostics, such as Thomson scattering, which measures plasma temperature and electron density. Diag2Diag can infer detailed measurements in regions that are otherwise hard to monitor, such as the plasma's edge or pedestal, a critical zone for sustaining stable fusion reactions. By improving data reliability, the AI helps scientists understand and control plasma instabilities that threaten reactor performance. It also supports leading theories about magnetic islands, regions where temperature and density even out, showing how these features can stabilize plasma under certain conditions.

According to researchers, Diag2Diag will make future fusion systems more compact, cost-effective, and resilient by reducing the need for extensive diagnostic hardware. Beyond fusion, the AI could be adapted for spacecraft systems, robotic surgery, and other technologies requiring continuous, high-precision sensor monitoring. Read More

10. Solar energy is now the world's cheapest source of power, a study finds

Solar energy has officially become the cheapest source of electricity worldwide, costing as little as £0.02 per kilowatt-hour in the sunniest countries, according to a

study by the University of Surrey's Advanced Technology Institute. The research shows that solar photovoltaic technology is now the main driver of the global shift to renewable power. Even in the UK, solar energy has emerged as the most economical option for large-scale electricity generation.

Global solar capacity surpassed 1.5 terawatts in 2024, more than doubling since 2020 and providing power to hundreds of millions of homes. The study also highlights an 89% drop in lithium-ion battery prices since 2010, making solar-plus-storage systems as cost-effective as gas-based plants. These integrated systems store solar energy for use when sunlight is unavailable, improving reliability and grid stability.

However, the researchers warn that connecting growing levels of solar power to existing electricity networks remains a key challenge. In regions such as California and China, grid congestion has led to wasted energy during peak sunlight hours. They emphasize the need for smart grids, artificial intelligence-based forecasting, and stronger interregional links to handle rising renewable energy inputs. The integration of energy storage, AI, and advanced materials such as perovskite solar cells could increase efficiency by up to 50%. But sustained policy support, through initiatives like the U.S. Inflation Reduction Act, the EU's REPowerEU plan, and India's Production Linked Incentive scheme, is essential to ensure continued progress toward a clean and reliable global energy system. Read More

QUANTUM & PHOTONICS

International

11. *Beyond electronics: Harnessing light for faster computing*

R Researchers at Tsinghua University have developed a groundbreaking optical computing chip called OFE2 that uses light instead of electricity to process data at record-breaking speeds. This innovation could transform real-time artificial intelligence applications such as surgical robotics, image recognition, and high-frequency financial trading, where every microsecond matters.

Traditional digital processors struggle to handle large volumes of data fast enough for these tasks due to physical limits on electronic speed. The new optical system bypasses this barrier by performing computations using light waves. Specifically, it employs optical diffraction operators - tiny structures that process information as light passes through them to extract features from data streams with remarkable energy efficiency and parallelism.

The Tsinghua team overcame long-standing challenges in maintaining stable, coherent light for such high-speed systems. Their OFE2 engine integrates tunable power splitters, precise delay lines, and an adjustable phase array on a single chip. Operating at 12.5 gigahertz, OFE2 can complete one matrix-vector multiplication in just 250 picoseconds, setting a new benchmark for optical computing speed. Demonstrations showed that OFE2 effectively extracted image features and supported profitable real-time trading

decisions based on time-series market data. By shifting heavy computations from energy-intensive electronics to ultrafast photonics, OFE2 enables faster, more efficient, and scalable AI systems. The researchers envision its use in applications like medical imaging, autonomous navigation, and quantitative finance, marking a major step toward the fusion of optics and artificial intelligence. Read More

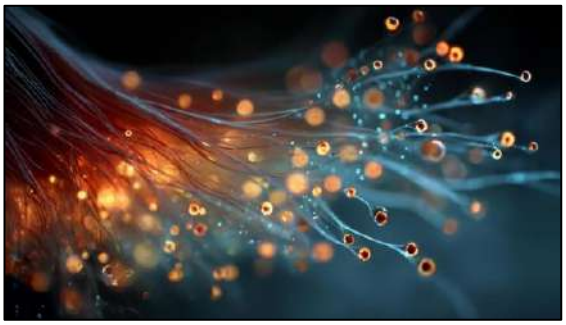
12. *Quantum simulations that once needed supercomputers now run on laptops*

Physicists at the University at Buffalo have developed a new computational method that allows complex quantum systems to be simulated on ordinary laptops instead of relying on costly supercomputers. The study expands on the truncated Wigner approximation (TWA), a long-standing semiclassical physics technique, making it powerful and user-friendly enough to handle real-world quantum problems involving energy loss and environmental interactions.

The TWA method, dating back to the 1970s, simplifies quantum calculations by retaining essential quantum features while omitting unnecessary complexity. However, it was previously limited to idealized, closed systems. The UB team extended it to dissipative spin dynamics, systems that interact with their surroundings. The breakthrough provides a ready-to-use framework that converts complex quantum equations into solvable forms, enabling researchers to input data and obtain results within hours.

This advancement drastically reduces computational costs and makes quantum dynamics more accessible. Marino explains that the approach allows scientists to reserve supercomputing resources for the most demanding problems while solving others on consumer-grade devices. The development could democratize quantum research and accelerate discoveries in physics, materials science, and quantum computing. Read More

13. *Scientists unlock a 100-year-old quantum secret to supercharge solar power*



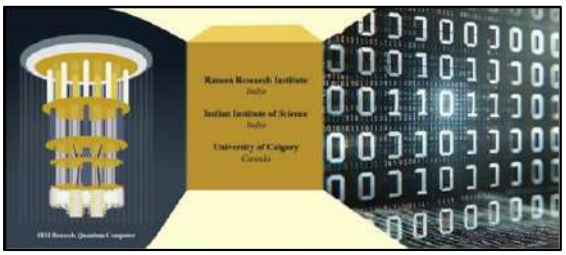
Scientists at the University of Cambridge have discovered a new quantum effect inside an organic semiconductor molecule, revealing a groundbreaking mechanism for turning light into electricity. The research shows that a molecule called P3TTM built around a single unpaired electron can generate electric charge on its own, a phenomenon previously seen only in inorganic materials. The team found that when P3TTM molecules pack closely together, their unpaired electrons interact in a way that mimics a Mott-Hubbard insulator, a well-known quantum system in metal oxides. This interaction allows electrons to move freely between neighboring molecules when exposed to light, producing an electric current with near-perfect efficiency.

Unlike conventional solar cells, which require two different materials to create charge separation, the P3TTM-based design works with just one. This could lead to lightweight, flexible, and low-cost solar

panels that are simpler to manufacture. The team's work also pays homage to physicist Sir Nevill Mott, whose theories of electron interaction laid the foundation for this discovery. The researchers believe this advance could usher in a new generation of organic solar devices, redefining how light is harvested for clean energy. Read More

National

14. ***Scientists certify true randomness marching towards a digitally safe world, one qubit at a time***



Indian scientists at the Raman Research Institute (RRI) have achieved a major milestone in quantum technology by demonstrating certified quantum randomness on a single qubit, without the need for complex optical setups. This breakthrough could revolutionize digital security by providing truly unhackable random numbers for encryption and data protection.

Randomness underpins all secure digital systems, yet conventional computers can only generate *pseudo-random* numbers, which are ultimately predictable. Quantum mechanics, by contrast, is inherently random. The RRI team developed a method to harness this intrinsic uncertainty using simple time-based tests on a single qubit, the fundamental unit of a quantum computer.

This achievement builds on years of foundational research. In 2022, RRI scientists proved quantum mechanics' validity through a loophole-free test of *Leggett-Garg inequalities* using photons. In 2024, they created a photonic quantum random number generator that produced millions of certified random bits. Now, in collaboration with the Indian Institute of Science and the University of Calgary, the team has successfully implemented certified randomness on IBM's cloud-based superconducting quantum processor, making it accessible globally.

By replacing complex spatial setups with sequential time measurements on one qubit, the researchers showed that even today's noisy, small-scale quantum computers can generate randomness verified by the laws of physics. This method not only strengthens quantum cryptography but also provides a simple benchmark for testing the reliability of qubits. The advance marks a step toward universally available quantum-certified randomness, a foundational resource for next-generation secure communications and digital infrastructure. Read More

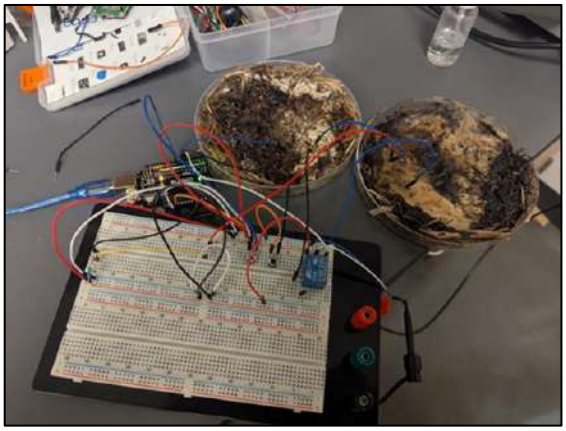
SEMICONDUCTORS

International

15. ***Scientists develop computer-like memory from shiitake mushrooms that could replace silicon-based chips***

Researchers at The Ohio State University have demonstrated that mushrooms can function as living memory devices, paving the way for sustainable, brain-inspired computers. In their study, scientists cultivated shiitake and button mushrooms and trained them to behave as organic memristors, components that remember previous electrical states, similar to how neural networks operate.

The fungal devices were able to switch between electrical states up to 5850 times per second with nearly 90% accuracy. When connected together, the mushrooms behaved like biological neurons, stabilizing performance at higher frequencies. This finding suggests that fungal networks could be ideal interfaces for high-frequency bioelectronics and environmentally friendly computing systems.

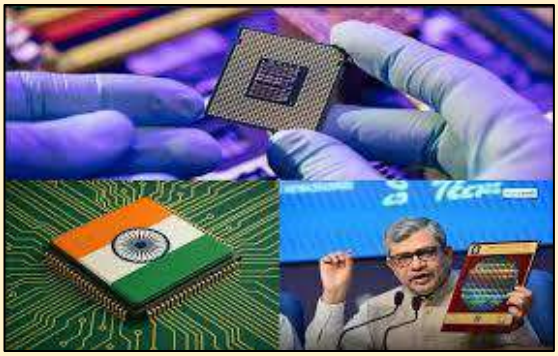


Because mushrooms are biodegradable, low-cost, and easy to cultivate, they offer a sustainable alternative to traditional semiconductor materials that rely on rare minerals and consume high energy. According to lead researcher, living circuits could significantly cut power use since they mimic natural brain activity, reducing energy consumption when idle.

Co-author Qudsia Tahmina emphasized the environmental potential of fungal computing, noting that scaling up these systems could support edge computing, aerospace applications, and wearable devices. Future work will focus on refining cultivation techniques and miniaturizing the components to make fungal memristors practical for next-generation bioelectronics. The research showcases a new frontier where biology meets technology, one where computers may one day grow rather than be manufactured. Read More

National

16. India Unveils Indigenous 7 nm Processor, Marking a New Era in Semiconductor Self-Reliance



India has announced the development of its first indigenously designed 7-nanometre processor, a milestone that positions the country among global leaders in advanced semiconductor research and innovation. The initiative, unveiled by Union Minister Ashwini Vaishnaw represents a key step in India's journey toward self-reliant, next-generation technology under the Atmanirbhar Bharat vision.

The processor is being developed at the Indian Institute of Technology, Madras, under the Ministry of Electronics and Information Technology's SHAKTI initiative, which uses open-source RISC-V architecture. This allows startups and industry players to build upon India's home-grown processor ecosystem without licensing restrictions.

Designed for high-performance and energy-efficient computing, the 7 nm chip will cater to critical sectors such as finance, communications, defence, and supercomputing. Its compact transistor density makes it ideal for advanced applications, reinforcing India's readiness for future semiconductor fabrication and integration efforts under the India Semiconductor Mission.

Backed by a ₹76,000 crore national mission, India has already approved 10 semiconductor projects worth over ₹1.6

lakh crore and supported 288 academic institutions through MeitY's Design Linked Incentive scheme. The roadmap ahead includes advancing to sub-7 nm nodes, building design and testing infrastructure, and generating thousands of high-skill jobs. This initiative marks not only a technological achievement but also a strategic commitment to positioning India as a global hub for chip design and manufacturing, enabling the nation to build chips in India for the world. Read More

SPACE & DEFENCE

National

17. DRDO releases the Indian Radio Software Architecture standard 1.0 to enable interoperability in Military Communication

The Defence Research and Development Organisation (DRDO), in collaboration with the Integrated Defence Staff (IDS) and the Tri-Services, has launched the Indian Radio Software Architecture (IRSA) standard 1.0 to enhance interoperability in military communications. Released during a national workshop, IRSA is a comprehensive software standard for Software Defined Radios (SDRs), defining uniform interfaces, APIs, and waveform portability mechanisms. It marks a major step toward self-reliance in defence communications, ensuring standardized, indigenous, and interoperable SDR solutions adaptable to future technologies.

The initiative, which began in 2021, was developed through extensive collaboration between DRDO, IDS, and the Armed Forces, and approved by the High-Level Advisory Committee in 2025. IRSA is envisioned not only as a national standard but also as a potential global benchmark, positioning India to export IRSA-compliant SDR technologies to friendly nations. The workshop also brought together stakeholders from defence, industry, and academia to discuss pilot projects and collaboration pathways. Read More

18. Military Combat Parachute System, indigenously developed, successfully tested at 32,000 feet altitude

The Defence Research and Development Organisation (DRDO) has achieved a major milestone in indigenous defence technology with the successful testing of the Military Combat Parachute System (MCPS) from an altitude of 32,000 feet. The test, conducted by Indian Air Force jumpers, showcased the system's reliability, precision, and advanced design. With this accomplishment, the MCPS becomes the only parachute system currently in operational service with the Indian Armed Forces capable of deployment above 25,000 feet, placing India among a select group of nations with such high-altitude capability.

Developed collaboratively by DRDO's Aerial Delivery Research and Development

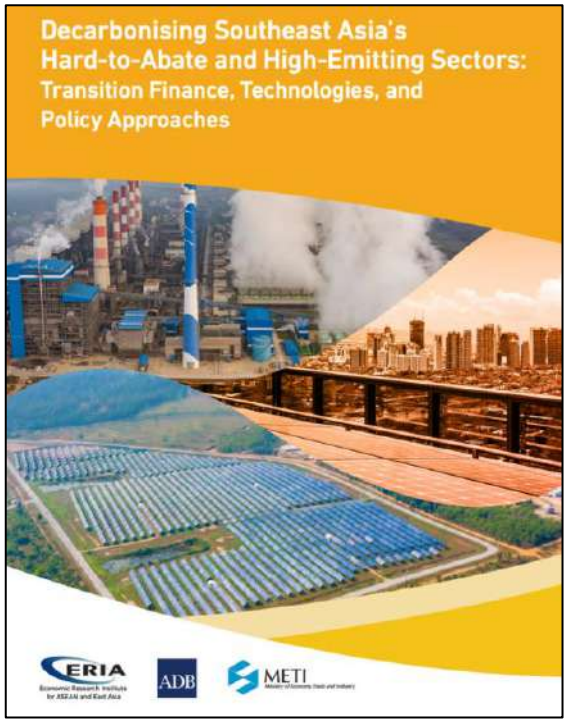
Establishment (ADRE), Agra, and Defence Bioengineering and Electromedical Laboratory (DEBEL), Bengaluru, the MCPS incorporates advanced tactical features, including a reduced rate of descent and enhanced steering control. These improvements enable paratroopers to execute safe exits, deploy parachutes at designated altitudes, navigate precisely, and land accurately in operational zones. The system is also compatible with the Navigation with Indian Constellation (NavIC) satellite network, ensuring autonomy and immunity from external interference or denial-of-service attacks by hostile entities.

The successful demonstration of the MCPS paves the way for the large-scale induction of indigenous parachute systems, significantly reducing dependence on imported equipment. Its design allows minimal turnaround time for maintenance and repairs, improving operational readiness and cost efficiency throughout its service life. This success not only strengthens India's aerial delivery capabilities but also marks a significant advancement toward achieving self-reliance in critical defence technologies under the 'Atmanirbhar Bharat' initiative. Read More

REPORTS/POLICY DOCUMENTS

International

19. ***ADB: Decarbonising ASEAN's Hard to Abate and High Emitting Sectors: Transition Finance, Technologies, and Policy Approaches***



The joint report titled Decarbonising ASEAN's Hard to Abate and High Emitting Sectors: Transition Finance, Technologies, and Policy Approaches, published in by ERIA, ADB, and Japan's Ministry of Economy, Trade and Industry (METI), explores how Southeast Asia can accelerate the decarbonisation of its most emissions-intensive industries, including power generation and heavy industry. These hard-to-abate sectors are central to ASEAN's energy transition and are highlighted in regional roadmaps identifying key investment areas for reducing emissions.

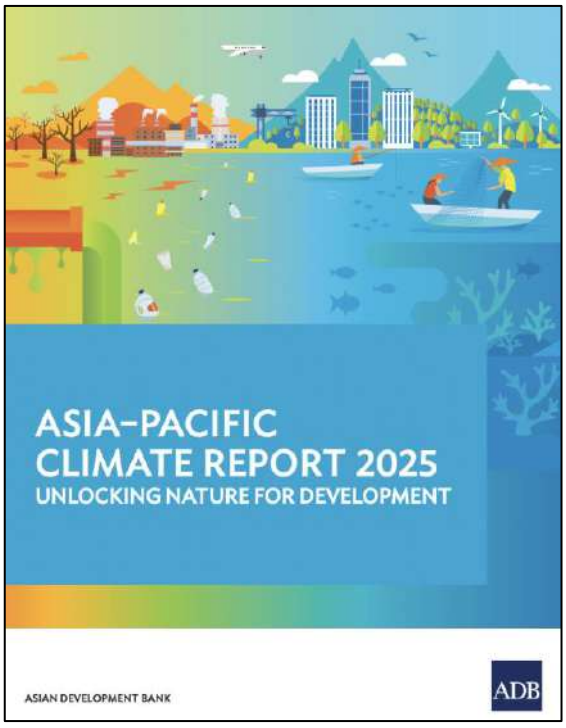
The report underscores the urgent need for transition finance, funding strategies that help industries shift progressively toward low-carbon operations while maintaining economic stability. It reviews current financing landscapes, emerging best practices, and innovative financial tools such as sustainability-linked instruments, blended finance, and policy incentives. Through case studies from across ASEAN countries, the report provides real-world examples of how renewable energy, green infrastructure, and clean industrial technologies are being scaled up to support the region's net-zero ambitions.

A key theme is the importance of regional cooperation among governments, financial

institutions, industries, and multilateral development partners to ensure a just and inclusive transition. Initiatives like the Asia Zero Emission Community (AZEC) are cited as vital to harmonising technical standards, aligning policies, and enabling coordinated infrastructure and investment planning.

The report concludes by proposing the creation of regional standards and financing mechanisms for early-stage industrial decarbonisation. These would direct concessional and blended capital toward high-impact projects, facilitate cross-border investments, and help ASEAN balance the energy trilemma of energy security, affordability, and sustainability on the path to a resilient low-carbon future. Download Report

20. *ADB: Asia-Pacific Climate Report 2025: Unlocking Nature for Development*



The Asia-Pacific Climate Report 2025: Unlocking Nature for Development, emphasizes that around 75 percent of GDP in Asia and the Pacific depends directly or indirectly on nature through sectors such as agriculture, fisheries, and tourism. Despite this, nature remains underrepresented in economic planning. The report warns that ecosystem degradation leads to increased health and disaster costs, reduced productivity, lower fiscal revenues, and weakened debt sustainability across the region. It highlights that ecosystem services like pollination, water purification, and climate regulation are fundamental to food security, public health, livelihoods, and climate resilience. Investing in healthy ecosystems is therefore vital for long-term economic growth and stability. The report identifies this as a crucial moment for governments and private companies to integrate nature into economic and financial decision-making frameworks.

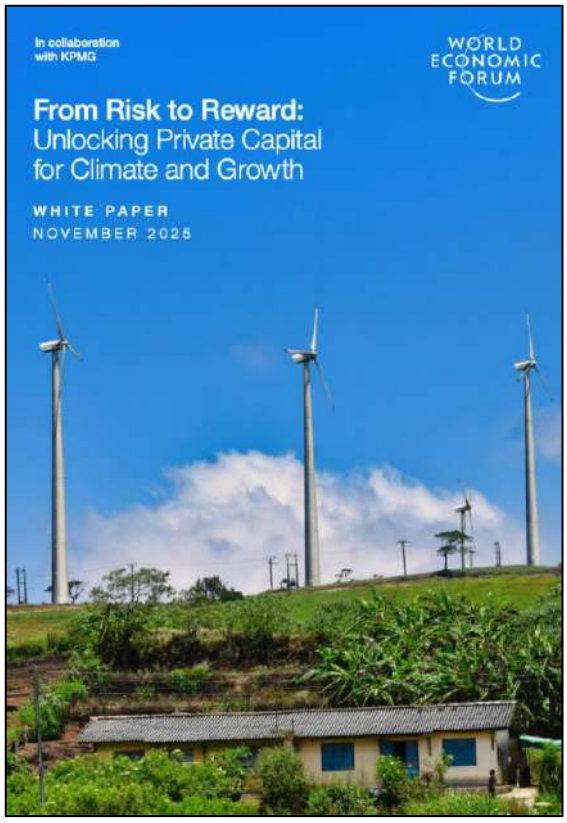
To enable large-scale nature-positive transformation, the report calls for scaling up nature finance through stronger governance, improved policy frameworks, and enhanced environmental data systems. Upgrading these systems will help correct market failures, ensure that the costs of environmental degradation and the benefits of restoration are properly reflected in economic activity, and align prices, policies, and investments with sustainability goals. Public finance, it notes, plays an important role in reducing early-stage risks and building enabling conditions, while private finance brings efficiency, innovation, and scalability.

Many promising initiatives across Asia and the Pacific remain at pilot stages not because of lack of innovation but due to limited access to capital. The report stresses improving financial literacy among conservation actors and environmental awareness among investors. It also promotes a landscape-based approach that connects ecological and economic systems, emphasizing regional cooperation to manage shared ecosystems effectively.

Finally, the report presents a ten-year roadmap for countries at different stages of

development to embed nature within their economic models and turn environmental performance into a competitive advantage. It is based on 15 background papers written by leading experts in environment, economics, finance, and policy. Download Report

21. ***WEF: From Risk to Reward - Unlocking Private Capital for Climate and Growth***



The report highlights the urgent need to mobilize large-scale private investment to address climate challenges in emerging markets and developing economies (EMDEs). Despite the growing recognition that climate change represents a systemic financial risk, funding for mitigation and adaptation remains far below what is required. EMDEs, which are among the most vulnerable to climate shocks, must mobilize around $2.4 trillion annually by 2030 to meet climate goals, including $1 trillion from private sources.

While international private climate finance to EMDEs doubled to $36 billion in 2023, it still needs to expand roughly 28 times to match the magnitude and urgency of global climate objectives. The report identifies persistent barriers to scaling investment, such as the lack of investable projects, insufficient coordination between project developers and investors, underdeveloped financial markets, elevated political and foreign exchange risks, and high capital costs. Drawing on insights from policymakers, multilateral development banks, development finance institutions, and climate finance specialists, the paper proposes a practical roadmap for mobilizing private capital. It incorporates feedback from a wide range of investors with differing risk appetites and strategic priorities.

The report outlines six priority areas and sixteen specific actions tailored to various stakeholders, aimed at bridging financing gaps and unlocking the next wave of private climate finance at scale. It stresses the importance of innovative financial instruments, blended finance mechanisms, stronger public-private partnerships, and improved risk-sharing structures to make climate investments more attractive and sustainable in developing economies. Download Report

National

22. ***NITI Aayog: 'Reimagining Manufacturing: India's Roadmap to Global Leadership in Advanced Manufacturing'***

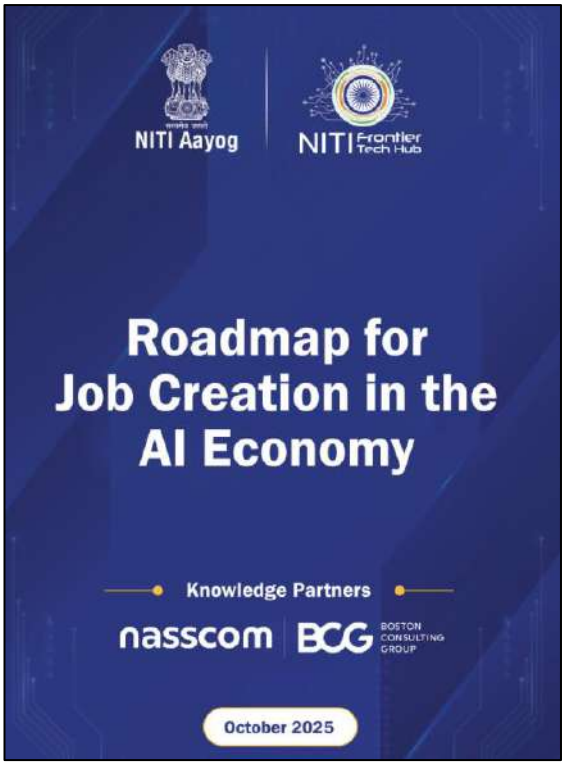
NITI Aayog's Frontier Tech Hub has launched *Reimagining Manufacturing: India's Roadmap to Global Leadership in Advanced Manufacturing*, a strategic plan to make India a global powerhouse in advanced manufacturing by 2035. The roadmap outlines a comprehensive strategy to integrate frontier technologies, such as Artificial Intelligence, Machine Learning, Advanced Materials, Digital Twins, and Robotics, across 13 priority manufacturing

sectors. These technologies are projected to boost manufacturing's contribution to over 25% of India's GDP, create more than 100 million jobs, and position India among the world's top three manufacturing hubs by 2035.

It identifies key barriers such as weak R&D ecosystems, limited industrial infrastructure, and workforce skill gaps, proposing a decade-long plan to strengthen these areas through technology-led interventions. The report warns that India risks losing up to USD 270 billion in manufacturing GDP by 2035 and USD 1 trillion by 2047 if it fails to adopt frontier technologies at scale.

Maharashtra committed to being the first state to align with the National Mission on Manufacturing, making Pune a hub for advanced manufacturing. NITI Aayog CEO Subrahmanyam emphasized that only rapid, technology-driven transformation can turn India into an advanced manufacturing leader. Developed with support from CII and Deloitte and guided by an expert council, the roadmap reflects a nationwide push for innovation-led industrial growth under the Viksit Bharat @2047 vision. The NITI Frontier Tech Hub aims to drive this transformation by coordinating national action across 20 key sectors to build a resilient, high-tech industrial ecosystem. Download Report

23. NITI Aayog: 'Roadmap for Job Creation in the AI Economy'



NITI Aayog has released the *Roadmap for Job Creation in the AI Economy*, outlining a strategic vision to position India as the global hub for AI-driven employment and innovation. The report highlights that while India's $245 billion technology and customer experience sectors face potential job displacements due to rapid AI adoption, the shift also presents an opportunity to create up to 4 million new jobs within the next five years. To capitalize on this opportunity, NITI Aayog proposes the launch of a *National AI Talent Mission*, a coordinated national initiative to make India the world's AI workforce capital by 2035.

The roadmap identifies three foundational pillars for transformation: integrating AI literacy across schools, universities, and vocational training; developing a large-scale reskilling and upskilling engine to prepare millions of professionals for AI-augmented roles; and positioning India as a global magnet for AI talent through retention, research partnerships, and international collaboration.It emphasizes collaboration between the proposed AI Talent Mission and the existing India AI Mission, encouraging partnerships among academia, government, and industry to create an enabling ecosystem of data, compute infrastructure, and innovation.

NITI Aayog CEO B.V.R. Subrahmanyam stated that India's strength lies in its people, noting the need for urgency, vision, and coordination to convert potential job disruption into large-scale job creation. NITI Distinguished Fellow Debjani Ghosh added that the difference between job loss and job creation depends on choices made today. Download Report

24. PSA Prof. Ajay Kumar Sood launched 'AI Playbooks for Agriculture and SMEs' and 'AI Sandbox White Paper' to accelerate Responsible AI Adoption across India

The Office of the Principal Scientific Adviser to the Government of India, in collaboration with the Ministry of Electronics and IT (MeitY) and the World Economic Forum's Centre for the Fourth Industrial Revolution (C4IR) India, launched three key publications under the *AI for India 2030* initiative. Principal Scientific Adviser Prof. Ajay Kumar Sood unveiled *Future Farming in India: AI Playbook for Agriculture*, *Transforming Small Businesses: An AI Playbook for India's SMEs*, and *Shaping the AI Sandbox Ecosystem for the Intelligent Age: White Paper* in the presence of senior government officials and industry leaders.

These playbooks aim to accelerate responsible and inclusive AI adoption across India's most critical sectors - agriculture and small businesses, by providing actionable frameworks built on extensive field pilots, stakeholder consultations, and multi-sector collaboration. The AI Sandbox White Paper offers a roadmap for secure, controlled testing of AI technologies aligned with India's national priorities.

The agriculture playbook presents an IMPACT AI framework to scale AI solutions for millions of farmers, improving yields, risk management, and market access through localized, policy-enabled innovation. The SME playbook focuses on democratizing AI for small enterprises, enhancing productivity, credit access, and competitiveness through a cluster-based approach integrating AI sandboxes, tools, and financing mechanisms. Prof. Sood emphasized that India's AI journey must be grounded in grassroots transformation, ensuring real benefits for farmers, entrepreneurs, and local communities.

The roadmap ahead calls for coordinated implementation coalitions involving state governments, industry bodies, and financiers, supported by a unified monitoring system to measure AI adoption and sectoral productivity gains - marking a major step in India's vision for responsible, scalable AI-led growth by 2030. Download Report

TECHNOLOGY ENGAGEMENTS/NEWS BYTES

International

25. *China bets on K-Visa to bridge tech talent gap, challenge US*

China has introduced a new K-visa aimed at attracting global talent in science and technology, positioning itself as a rival to the United States' H-1B visa program. The initiative seeks to fill domestic skill gaps and strengthen China's drive for leadership in advanced technologies such as semiconductors, artificial intelligence, and robotics. Unlike the existing R-visa for foreign professionals, the K-visa allows applicants to apply even without a confirmed job offer, making it easier for skilled workers to relocate.

The policy comes as U.S. immigration has tightened, with increased fees and restrictions under previous administrations, leading some international professionals to consider alternatives. Experts say Beijing sees this as a chance to brand itself as more open to global talent amid geopolitical competition with Washington.

While the scheme aims to boost innovation, it has sparked mixed reactions domestically. China faces high youth unemployment, and some local graduates worry that foreign workers could intensify competition for limited jobs. Nonetheless, economists argue that international professionals can fill specialized roles, create new opportunities, and enhance China's technological competitiveness.

Foreign professionals still face barriers, including language challenges, censorship, and limited pathways to permanent residency. As of 2023, China hosted around 711,000 foreign workers, a fraction of its 1.4 billion population. Analysts note that despite China's incentives, the U.S. remains more attractive for many due to its research ecosystem, English language advantage, and established career pathways. Observers say that while China's K-visa could help attract regional talent, particularly from India and Southeast Asia, it will take more than relaxed visa policies to rival the U.S. in global talent attraction and technological leadership. Read More

26. *China expands rare earths restrictions, targets defense and chips users*

China has expanded its export controls on rare earth elements, adding five new materials and new regulations targeting semiconductor and defense-related users. The move, announced by the Ministry of Commerce, strengthens Beijing's control over global technology supply chains just weeks before the planned Trump-Xi meeting in South Korea. The newly restricted elements - holmium, erbium, thulium, europium, and ytterbium, join seven others already under export limitations.

The new rules also require foreign companies that use Chinese rare earth materials or refining technology to obtain export licenses, even if no Chinese firms are directly involved in the transactions. This mirrors U.S. restrictions on semiconductor exports to China and signals a growing technological divide between the two powers. Beijing says the new restrictions are limited in scope and will include measures to ease licensing for compliant firms. However, analysts view the move as part of a strategic effort to gain leverage in trade negotiations and secure China's dominance in rare earth processing, where it controls over 90% of global output.

The rules also impose tighter scrutiny on exports tied to defense and advanced semiconductor sectors, including chips of 14 nanometers or smaller, 256-layer memory chips, and AI technologies with potential military applications. Licenses will be denied for overseas defense users and reviewed case-by-case for advanced chip producers.

The announcement triggered stock surges in Chinese and U.S. rare earth companies, reflecting expectations of tightening global supply. Analysts warn the move could accelerate efforts by the U.S., Europe, and allies to develop alternative supply chains, marking a new phase of "strategic bifurcation" in global technology and materials trade. Read More

27. *Nvidia hits new milestone as world's first $5tn company*

Nvidia has become the world's first company to reach a market valuation of $5 trillion, marking a historic milestone that cements its dominance in the global artificial intelligence (AI) industry. The U.S.-based chipmaker, once known primarily for designing graphics processors, has transformed into the backbone of the AI revolution, with its chips powering everything from large language models like ChatGPT to advanced computing systems worldwide.

The company's stock surged over, lifting its total value past $5.03 trillion, more than the GDP of every nation except the U.S. and China. This achievement comes just three months after Nvidia crossed the $4 trillion threshold. CEO Jensen Huang announced $500 billion worth of AI chip orders and plans to build seven new supercomputers for the U.S. government, underscoring the company's central role in the global AI arms race.

Nvidia's success has been fueled by relentless demand for its H100 and Blackwell processors, which are critical to training and running complex AI systems. Partnerships with major tech firms such as OpenAI and Oracle have also helped cement its leadership position. Meanwhile, geopolitical tensions remain a key factor, with President Donald Trump expected to discuss Nvidia's chips with China's Xi Jinping amid ongoing export control disputes.

Huang's personal fortune has surged alongside Nvidia's rise, with his stake now worth about $179 billion, making him the world's eighth-richest person. However, analysts warn that soaring valuations could signal an emerging AI bubble, as tech firms continue to invest heavily in one another. Despite such concerns, Nvidia's dominance in AI hardware keeps it at the heart of the most powerful technological and financial story of the decade. Read More

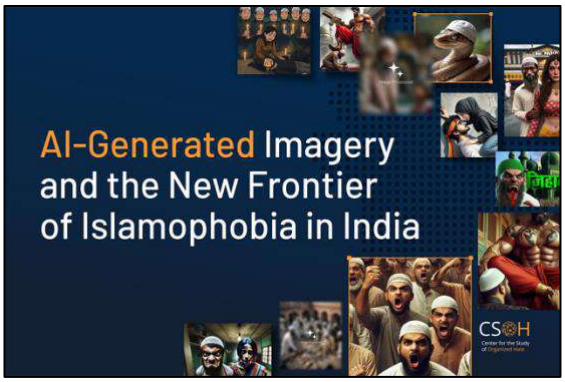
28. *US-Australia critical minerals deal underscores the gap to China*

The new U.S.- Australia critical minerals agreement marks a significant step toward reducing Western dependence on China, but analysts caution it is far from sufficient to alter global supply chain dominance in the near term. The deal commits up to $8.5 billion to develop and refine key minerals essential for defense, manufacturing, and clean energy technologies. China currently controls about 90% of refined rare earths and graphite, nearly 80% of cobalt, and about 70% of lithium and nickel (including its influence in Indonesian refining). The U.S.- Australia partnership aims to diversify these supply chains through strategic investments, including $2.2 billion in letters of interest from the U.S. Export-Import Bank for projects by Arafura Rare Earths, Sunrise Energy Metals, and Alcoa, which plans to build a gallium plant in Western Australia capable of supplying up to 10% of global demand.

While the announcement was well received at Sydney's IMARC mining conference, experts noted that the West faces a long race to catch up. Building alternative refining and processing capacity will take years, and costs remain a major hurdle, as Chinese producers still operate more efficiently. Governments may need to offer subsidies, tax incentives, or tariffs to sustain competitive non-Chinese supply chains. Ultimately, the deal signals intent rather than immediate impact. It could pave the way for deeper public–private cooperation and further international investment, but for now, China remains far ahead in the global race for critical minerals and refined materials. Read More

National

29. *AI-generated images fuelling hate against Muslims in India, says US thinktank report*



A recent report from the US-based Center for the Study of Organized Hate has warned that artificial intelligence (AI) tools are being weaponised in India to spread Islamophobic propaganda. The study, released on September 29, analysed over 1,300 AI-generated images and videos circulated across X (formerly Twitter), Facebook, and Instagram between May 2023 and May 2025. These visuals often depict Muslim men with exaggerated or evil features and Muslim women in sexualised or submissive roles, reinforcing Hindutva conspiracy narratives and anti-Muslim stereotypes.

The report found that such AI-generated content garnered over 27 million engagements, 91% of which occurred on X, highlighting the scale of online hate amplification. Researchers categorised the content into four main themes: conspiratorial Islamophobia, dehumanising rhetoric, sexualisation of Muslim women, and the aestheticisation of violence. Of these, gendered Islamophobia received the highest engagement, portraying Muslim women as objects of domination or spoils of conquest to symbolically validate

misogyny and communal hatred. Some images use popular animation styles, such as Ghibli-style artwork, to sanitise depictions of violence like the Babri Masjid demolition or police brutality, making hate narratives appear visually appealing and socially acceptable.

The report warns that generative AI has accelerated the production and spread of hateful propaganda with unprecedented realism and reach, deepening societal divisions and threatening democratic institutions in India. It calls on technology firms and AI developers to intervene by enforcing ethical safeguards and transparency in AI-generated content. Experts caution that if unchecked, AI-generated misinformation could soon become indistinguishable from reality, further endangering minority communities and public trust in digital information. Read More

30. *AI for Good Summit' at India Mobile Congress (IMC) 2025*

The Department of Telecommunications (DoT) and the International Telecommunication Union (ITU) jointly hosted the 'AI for Good - Impact India' Conference 2025 at the India Mobile Congress (IMC) in New Delhi, highlighting India's leadership in advancing responsible and inclusive Artificial Intelligence (AI). The event, inaugurated by Dr. Neeraj Mittal, Secretary (Telecom), and Bilel Jamoussi, Deputy Director and Chief of Telecommunication Standardization Policy Department at ITU, brought together global AI leaders, policymakers, industry experts, startups, and academia to explore AI-driven solutions for sustainable development in key areas such as healthcare, agriculture, climate resilience, and digital inclusion.

Dr. Mittal underscored both the promise and risks of AI, stressing its potential to enhance network intelligence and self-healing capabilities as India transitions from 5G to 6G, while also warning about emerging threats like deepfakes, voice cloning, and financial fraud. He reaffirmed India's commitment, under the leadership of Prime Minister Narendra Modi, to a human-centric AI ecosystem through the $1.25 billion IndiaAI Mission. Bilel Jamoussi commended India's proactive approach to ethical AI and digital inclusion, urging global partnerships to counter misuse, data privacy risks, and cybersecurity vulnerabilities. The summit featured high-level discussions on topics such as AI governance, cybersecurity, quantum computing, robotics for youth safety, and AI for disaster management.

The 'Innovation Factory' initiative, launched under the AI for Good framework, showcased innovative AI solutions by Indian startups addressing real-world challenges. The event concluded with the AI Native Bharat 5G Build-a-Thon awards, celebrating young innovators for pioneering AI and machine learning applications in telecom and technology. As Asia's largest digital technology forum, IMC 2025 reaffirmed India's role in shaping global AI standards and promoting technology for societal good through collaboration, ethical frameworks, and innovation. Read More

31. *Cabinet approves Phase III of Biomedical Research Career Programme (BRCP)*

The Union Cabinet has approved Phase III of the Biomedical Research Career

Programme (BRCP), marking a major step toward strengthening India's biomedical research ecosystem. The initiative, jointly implemented by the Department of Biotechnology (DBT) and the Wellcome Trust (WT), United Kingdom, will be executed through the India Alliance from 2025-26 to 2030-31, with an additional six years for servicing fellowships and grants. The total outlay is Rs. 1,500 crore, with DBT contributing Rs. 1,000 crore and WT Rs. 500 crore.

Aligned with the vision of Viksit Bharat, Phase III of the BRCP aims to nurture top-tier scientific talent, advance interdisciplinary and translational research, and reduce regional disparities by building world-class research capacity. The programme will focus on three key components: early and intermediate research fellowships in basic, clinical, and public health sciences; collaborative grants for multi-investigator teams; and a research management programme to strengthen institutional support systems.

In addition to promoting mentorship, networking, and public engagement, the phase will foster national and international collaborations. The programme is expected to train more than 2,000 researchers and postdoctoral fellows, generate high-impact publications, and boost patentable innovations. It also seeks to enhance women's participation by 10-15%, achieve technology readiness level 4 in 25-30% of collaborative projects, and expand scientific engagement in Tier-2 and Tier-3 cities. Building on the success of Phases I and II, which established India as a growing hub for world-class biomedical research, Phase III will reinforce India's position in the global knowledge economy by investing in talent, innovation, and translational capacity. Read More

32. DRDO hands over 12 Licensing Agreements for Transfer of Technology for eight products to the industry

During SAMANVAY 2025, a two-day industry synergy meet organised by the Defence Research and Development Organisation's (DRDO) Electronics and Communication Systems (ECS) Cluster in Bengaluru, DRDO handed over 12 Licensing Agreements for Transfer of Technology (LATOTs) for eight advanced products to its industry partners. These technologies include the D-29 Electronic Warfare Suite, NATSAT communication terminals, Sarang Electronic Support Measure System, DOLPHIN-II, Laser Beam Rider Guidance System, Athermal Laser Target Designator, Laser Photoacoustic Spectroscopy systems, and M-Type Dispenser Cathode. The agreements were signed with Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), and several private companies including DH Limited, Enertech Engineering, Beam Infotech, Nibe Ltd, and Panacea Medical Technologies.

The event, attended by over 150 industry partners, aimed to enhance collaboration between DRDO and Indian industries,

particularly MSMEs and start-ups, under the vision of 'Aatmanirbhar Bharat'. In his virtual address, Secretary, Department of Defence R&D, and Chairman DRDO, Dr. Samir V. Kamat emphasised that DRDO's partnerships with industry are transforming innovations from research laboratories into deployable defence capabilities. He reiterated DRDO's commitment to 'Make in India, Make for the World' by fostering indigenous defence manufacturing.

SAMANVAY 2025 featured ten sessions on topics such as enhancing the defence R&D ecosystem, industry engagement, DRDO policy reforms, and the role of MSMEs in defence innovation, reaffirming DRDO's mission to build a robust, self-reliant defence technology base for India. Read More

33. *Google to invest $15bn to build AI data hub in India*

Google's parent company, Alphabet, has announced a $15 billion investment to establish a major AI data hub in Visakhapatnam, Andhra Pradesh, its largest AI infrastructure project outside the United States. The facility will be part of Google's global network of AI centres across 12 countries and will be developed over the next five years.

Thomas Kurian, CEO of Google Cloud, said the project reflects the company's commitment to India's growing digital economy, calling it 'the largest AI hub we are going to be investing in anywhere in the world outside the United States.' Alphabet CEO Sundar Pichai added that the initiative will accelerate AI innovation and expand access to cutting-edge technologies for Indian enterprises and users.

The project integrates cloud computing, AI infrastructure, renewable energy, and advanced fibre-optic networks. It aligns with Andhra Pradesh's goal of developing 6GW of data centre capacity by 2029 and will significantly boost the state's digital infrastructure and economic growth. Andhra Pradesh's government, which is offering subsidised land and electricity to attract investment, described the project as a 'massive leap' for the state's digital future.

India has rapidly become a global hotspot for data centres due to its low data costs, skilled workforce, and expanding internet user base. The country's data centre capacity crossed 1GW in 2024, triple its 2019 level, underscoring its strategic importance for global tech giants seeking to expand cloud and AI operations. Read More

34. *India elected as Co-Chair of the Regional Committee of United Nations Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP) for 2025-2028 term*

India has been elected as the Co-Chair of the Regional Committee of the United Nations Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP) for the 2025-2028 term, represented by the Surveyor General of India, Shri Hitesh Kumar S. Makwana,

IAS. The election took place during the fourteenth plenary meeting of UN-GGIM-AP, held from 24-26 September 2025 in Goyang-si, Republic of Korea, hosted by the National Geographic Information Institute (NGII). India's election marks a significant milestone in its growing leadership in the global geospatial domain, recognising its contributions in innovation, capacity building, and fostering regional cooperation. As Co-Chair, India will work in alignment with the UN-GGIM Strategic Framework to promote secure digital transformation, good governance, and data-driven decision-making across the Asia-Pacific region.

In his remarks, Shri Makwana expressed gratitude to member states for their trust and emphasised India's commitment to advancing inclusivity, transparency, and measurable outcomes in geospatial information management. He highlighted that the upcoming term will focus on strengthening partnerships and building capacity for sustainable development and resilient governance. The appointment is expected to further enhance India's role in shaping regional and global geospatial policies, positioning it as a key player in advancing digital and spatial data infrastructure.

UN-GGIM-AP, representing 56 countries in Asia and the Pacific, serves as one of the five regional committees of the UN-GGIM. It works to maximise the economic, social, and environmental benefits of geospatial information through cooperation, capacity development, and policy harmonisation. Read More

35. *India advances defence Tech with Titanium plant in Lucknow*

Raksha Mantri Shri Rajnath Singh dedicated to the nation the Titanium and Superalloy Materials Plant at PTC Industries' Strategic Materials Technology Complex in Lucknow, marking a major milestone in India's push for self-reliance in advanced defence and aerospace materials. Emphasising the importance of producing rare and strategic materials domestically, he said that India must "produce rare materials used in defence and aerospace to become a technology creator and safeguard its technological sovereignty."

The plant, one of the first private sector facilities to manufacture aero-engine and superalloy components, represents a major step toward reducing India's dependence on imports for critical technologies. Spread over 50 acres with an investment of ₹1,000 crore, it has a production capacity of 6,000 tonnes per annum and will enable the domestic production of aviation-grade titanium and superalloys from local and recycled sources. Shri Rajnath Singh highlighted that such initiatives strengthen the foundation of *Aatmanirbhar Bharat*, enabling India to design, develop, and deliver high-end technologies indigenously.

During the event, an MoU was signed between PTC Industries and Bharat Dynamics Limited (BDL) for the joint development of propulsion systems, guided bombs, and small aero-engines for missiles and UAVs. PTC also received multiple Letters of Technical Acceptance (LoTA) from DRDO's CEMILAC for the indigenous manufacture of titanium castings for the Advanced Medium Combat Aircraft (AMCA) and the Kaveri Derivative Engine (KDE-2), alongside an order for single-crystal turbine blades.

Shri Rajnath Singh praised Uttar Pradesh's industrial growth and the progress of the UP Defence Industrial Corridor, expressing confidence that the complex will generate significant employment and innovation opportunities.

He urged youth, start-ups, and MSMEs to actively participate in India's growing defence manufacturing ecosystem, reaffirming the government's commitment to making India a global hub for advanced materials and defence technologies. Read More

WHAT'S UPCOMING?

36. GeoSmart India 2025, 1-4 Dec 2025, Bharat Mandapam, Delhi

GeoSmart India 2025 is India's flagship geospatial and GIS conference, scheduled from 1-4 December 2025 at Bharat Mandapam, New Delhi, and convened by Geospatial World. Positioned as a premier national platform, it brings together central and state government leaders, national mapping agencies, defence and security organisations, startups, and global geospatial companies to deliberate on how location intelligence, satellite data, digital twins, and AI can power India's digital governance, infrastructure, climate resilience, and Viksit Bharat agenda.

The event features high-level plenaries, thematic summits, technology exhibitions, and stakeholder roundtables designed to drive policy conversations, showcase solutions, and foster public–private collaboration across sectors such as smart cities, transport, utilities, disaster management, agriculture, and national security, reinforcing India's ambition to build a future-ready geospatial ecosystem. Know More

37. Defence Tech Week, 1-2 Dec 2025, Tel Aviv University, Israel

Defense Tech Week is a premier annual event that brings together military leaders, defense industry innovators, and governmental stakeholders from around the globe to explore the latest advancements in defense technology, cyber security, and homeland security solutions.

The event features an extensive exhibition of cutting-edge military hardware, AI-enabled defense systems, autonomous platforms, and digital battlefield innovations, alongside strategic workshops, panel discussions, and high-level keynotes. It provides a unique platform for fostering international collaboration, public-private partnership, and knowledge exchange on emerging threats, defense modernization, and future warfare technologies, all aimed at strengthening national security and resilience in an increasingly complex global security environment. Know More

38. Annual Information Security Summit (AISS), 3-5 Dec 2025, Delhi

AISS 2025, the Annual Information Security Summit organized by DSCI, is one of India's flagship cybersecurity and data protection conferences, bringing together CISOs, policymakers, industry leaders, startups, law enforcement, and academia to address next-generation cyber risks in an AI-driven world. The 2025 edition features deep-dive workshops and tracks on AI-powered threat detection, DPDP Act readiness, securing APIs and cloud, zero trust, agentic AI, OT and critical infrastructure security, as well as specialized sub-summits on quantum technologies, healthcare cybersecurity, digital forensics, and OT security, alongside PULSE 2025 for cyber skilling and Women in Security initiatives. Designed as a multi-day platform with keynotes, plenaries, hackathons, tabletop simulations, and innovation showcases, AISS 2025 aims to strengthen India's national cyber resilience, global partnerships, and future-ready security workforce. Know More

THE TECH SHOWCASE! (ANNEXURE)

Compilation of Technology Innovations by premier research institutions of India. The details are shared in the Annexure.

Council of Scientific and Industrial Research (CSIR)

Fermentation based Technology Development for Biodegradation of Ammonium Perchlorate

IIT Roorkee

1. A perovskite-based alpha particle detector for monitoring radon progeny and a portable system employing the same
2. Wearable cooling system
3. System and method for real-time vehicle occupancy monitoring and alert generation
4. A transition structure from a microstrip line to an empty substrate integrated waveguide (ESIW)
5. A system and a method for managing power distribution
6. A multi-pass helical submerged membrane distillation module for desalination wastewater treatment and method thereof

#NESTLaugh-orithm

India AI Impact Summit 2026

Brief Glance

(Details - https://impact.indiaai.gov.in/)

Overview

India will host the **AI Impact Summit** in **February 2026 at Bharat Mandapam, New Delhi,** as a global convening to shape the future of inclusive, responsible, and resilient Artificial Intelligence (AI).

Building on the momentum of previous multilateral initiatives including the Bletchley Park, Seoul, Paris, and Kigali Summits, the AI Impact Summit is envisaged to mark a shift from aspirations to impact, demonstrating how AI can deliverable tangible outcomes for *People, Planet, and Progress.*

As the first Global AI Summit of this series to take place in the Global South, the Impact Summit will advance a future where the transformative impact of AI serves humanity, advances inclusive growth, fosters social development, and promotes people-centric innovations that protect our planet.

The Summit builds on extensive groundwork, including five rounds of public consultations and global outreach sessions in Paris, Berlin, Oslo, New York, Geneva, Bangkok, and Tokyo. Regional events across India have ensured grassroots voices are represented, while over 50 affiliated Pre-Summit Events worldwide have generated actionable insights and broadened participation. Complemented by curated consultation sessions for the flagship events and working groups, these efforts reflect India's deeply participatory approach to the Impact Summit.

Themes & Working Groups

AI today stands at an inflection point, with the power to reshape economies, accelerate scientific discovery, and address urgent global challenges, but also the potential to widen divides if left unchecked. The Summit provides a platform to bridge this gap, ensuring that the future of AI is shaped by collective action and shared responsibility.

To translate this vision into action, the Summit is anchored in **three guiding principles** or ***Sutras*** of ***People, Planet, and Progress***, which frame how AI should serve humanity, safeguard the environment, and drive inclusive growth. These guiding Sutras are further operationalized through **seven *Chakras*** or **thematic working groups**, each focusing on a critical dimension of AI's global impact. Together, the *Sutras* and *Chakras* provide a cohesive framework that moves the conversation from aspirational commitments to measurable outcomes, ensuring that the benefits of AI are equitably realized across the world.

The Seven Chakras:

1. **Human Capital**: AI is changing the nature of work at an unprecedented pace, creating new opportunities while also disrupting traditional livelihoods. The Human Capital Chakra focuses on equipping people with the skills and literacy needed to thrive in an AI-driven world. It emphasizes reskilling, inclusive workforce transition strategies, and

ensuring that productivity gains are shared widely. This theme recognizes that AI must enhance, not undermine, human potential.

2. **Inclusion for Social Empowerment**: Much of today's AI reflects the languages, cultures, and contexts of a handful of regions, leaving billions without meaningful representation. The *Inclusion Chakra* seeks to address this by fostering the development and deployment of AI systems that are inclusive by design, locally relevant, and culturally respectful.

3. **Safe and Trusted AI**: With AI increasingly embedded in critical systems, ensuring safety and trust is essential. This *Chakra* focuses on democratizing access to technology-enabled governance tools and frameworks, empowering all nations and stakeholders with the technical capabilities needed to govern AI effectively. It promotes technology-enabled solutions for oversight that can be adopted across regions, ensuring AI remains transparent, accountable, and aligned with shared values.

4. **Resilience, Innovation & Efficiency**: The scale of resources consumed by modern AI solutions presents myriad challenges for the environment as well as exacerbates existing AI divide between nations. This *Chakra* prioritizes the development of frugal, energy-efficient, and sustainable AI innovations. It aims to ensure that AI systems can be deployed equitably in resource-constrained settings, making them resilient, adaptable, and environmentally responsible.

5. **Science:** AI has the potential to accelerate global scientific progress by enabling advanced simulations, data-driven discovery, and cross-disciplinary insights. Yet, access to research infrastructure remains highly unequal. This *Chakra* focuses on building inclusive scientific partnerships, expanding AI research ecosystems in the Global South, and ensuring that scientific innovation is both collaborative and globally accessible.

6. **Democratizing AI Resources**: The resources required to build competitive AI systems, including datasets, compute power, and advanced models, remain concentrated in a few nations and corporations. This *Chakra* seeks to redress that imbalance by advocating equitable access to these foundational tools. By broadening access, it enables innovations that reflect diverse global realities and contribute to shared progress.

7. **AI for Economic Growth & Social Good**: AI can significantly advance development goals, including across healthcare, education, agriculture, among others. However, deployment in these sectors remains fragmented. This *Chakra* focuses on scaling successful solutions, creating frameworks for cross-border collaboration, and ensuring that AI for social good is practical, replicable, and accessible to all countries.

Cities for Hybrid Meetings of Working Groups (one each)

Working group meetings will **begin from mid-October** and continue till end of December. Each working group will **convene at least thrice virtually** and once in hybrid mode.

Working Group	City (Tentative)
Human Capital	Guwahati

Inclusion for Social Empowerment	Hyderabad
Safe & Trusted AI	Chennai
Resilience, Innovation, & Efficiency	Bengaluru
Science	Mumbai
Democratising AI Resources	Bhubaneshwar
AI for Social Good & Economic Development	Kanpur

Flagship Events

In the run-up to the India AI Impact Summit, a series of flagship initiatives have been conceived to sustain global momentum, broaden participation, and demonstrate the transformative power of AI. Collectively, they embody India's vision of an AI ecosystem that is inclusive, participatory, and aligned with the broader objectives of People, Planet, and Progress.

Each flagship event is carefully designed to highlight a different dimension of AI's societal impact, from empowering youth and women innovators to supporting startups, scaling social-good solutions, showcasing global innovations, and advancing applied research.

YUVAi – Global Youth Challenge: A global youth challenge inviting students to design AI-based solutions for real-world challenges. Through mentorship and applied learning, it nurtures innovation and ethical awareness, with finalists showcasing their work at the Summit.

AI by HER – Global Impact Challenge: A global innovation challenge inviting women technologists to demonstrate AI solutions tackling large scale or novel real-world public challenges.

AI for ALL - Global Impact Challenge: The AI for All: Global Impact Challenge strives to identify solutions that use AI to enable large-scale impact. The leading solutions get showcased at the India - AI Impact Summit to be held in New Delhi, India in February 2026.

UDAAN – Global AI Pitch Fest: A showcase for high-potential AI startups addressing critical societal needs. Selected ventures will pitch before investors, policymakers, and technology leaders, catalysing visibility, partnerships, and socially aligned entrepreneurship.

AI Impact Expo: A experiential showcase at Bharat Mandapam (16–20 February 2026), featuring international, state, enterprise, and startup pavilions. It will demonstrate AI's applications across critical sectors.

Research Symposium on AI & its Impact: The Symposium is conceived as an interdisciplinary forum that brings together leading researchers and practitioners from India, the Global South, and the wider international community to present frontier work on the impact of AI, exchange methods and evidence, and forge collaborations.

Pre-Summit Events

In the run-up to the Summit, a series of Pre-Summit Events are being organised across India and globally, to enrich the deliberations of the main Summit by bringing in diverse perspectives and highlighting innovative use cases.

Pre-Summit Events are independently hosted convenings that receive official affiliation to the India - AI Impact Summit 2026. They are intended to widen stakeholder participation ahead of the Summit, surface actionable inputs aligned with its themes, and provide decentralized platforms for knowledge exchange.

Apply to Host a Pre-Summit Event: The call for proposals for Pre-Summit Events is available at: https://impact.indiaai.gov.in/home/pre-summit-events

As of October 2025, more than **50 Pre-Summit Events have been held**. The geographic footprint spans **11 Indian states** and **16 cities**, with international participation extending to six countries. In total, **375 applications** have been received, of which 53 are from international organisations or for events to be held abroad, and 322 are India-based.

Together, this growing ecosystem of Pre-Summit Events is creating a distributed global dialogue on AI, surfacing perspectives from across geographies, and feeding insights directly into the Summit process.

Provisional Agenda

Date	Event	Remarks
15th February 2026	Cultural Day	Central Park & Other area around Delhi
16th - 18th February 2026	Flagship Event Finales	
19th February 2026	Summit Day 1	Leaders Plenary CEO Roundtable
20th February 2026	Summit Day 2	GPAI Council Meeting Panel Discussions Keynotes Roundtables

For suggestions/feedback, please reach out to us on:
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The New, Emerging, and Strategic Technologies (NEST) Division, established in 2020 under the Ministry of External Affairs (MEA), focuses on technology diplomacy and the international aspects of critical, strategic and emerging technologies. It enhances India's participation in global forums, shaping technology governance and safeguarding national interests. As technology has become central to economic and geopolitical agendas, the Division coordinates with domestic and international stakeholders on advancements like Artificial Intelligence, Quantum Technology, 5G/6G, Biotechnology, Green energy, Semiconductors, and others. NEST also builds internal capacity within MEA, facilitates policy engagement, and assesses foreign policy implications. It plays a key role in shaping India's stance on global tech governance and cooperation.

New, Emerging & Strategic Technologies Division
Ministry of External Affairs
Government of India